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Notes, outline and divergence times of Basidiomycota

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Abstract
The Basidiomycota constitutes a major phylum of the kingdom Fungi and is second in species numbers to the Ascomycota. The present work provides an overview of all validly published, currently used basidiomycete genera to date in a single document. An outline of all genera of Basidiomycota is provided, which includes 1928 currently used genera names, with 1263 synonyms, which are distributed in 241 families, 68 orders, 18 classes and four subphyla. We provide brief notes for each accepted genus including information on classification, number of accepted species, type species, life mode, habitat, distribution, and sequence information. Furthermore, three phylogenetic analyses with combined LSU, SSU, 5.8s, rpb1, rpb2, and ef1 datasets for the subphyla Agaricomycotina, Pucciniomycotina and Ustilaginomycotina are conducted, respectively. Divergence time estimates are provided to the family level with 632 species from 62 orders, 168 families and 605 genera. Our study indicates that the divergence times of the subphyla in Basidiomycota are 406–430 Mya, classes are 211–383 Mya, and orders are 99–323 Mya, which are largely consistent with previous studies. In this study, all phylogenetically supported families were dated, with the families of Agaricomycotina diverging from 27–178 Mya, Pucciniomycotina from 85–222 Mya, and Ustilaginomycotina from 79–177 Mya. Divergence times as additional criterion in ranking provide additional evidence to resolve taxonomic problems in the Basidiomycota taxonomic system, and also provide a better understanding of their phylogeny and evolution.

Keywords Classification · Molecular clock · Fungi · Systematics · Taxonomy

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Introduction

The *Outlines of the Fungi* provide essential taxonomic information which are easy to use by workers in various disciplines incorporating mycological fields (Wijayawardene et al. 2017, 2018a, b). In the Kingdom Fungi, the phyla Ascomycota and Basidiomycota cover around 97% of all fungal species (Willis 2018). Wijayawardene et al.

(2017) provided notes on 6450 genera of Ascomycota and Wijayawardene et al. (2018a) provided an outline for this group. The outline of the Ascomycota was initiated by Eriksson and Hawksworth (1986). Follow-ups and rearrangements were published in a series by Eriksson (1991, 1998, 1999), Eriksson and Winka (1997) and Eriksson et al. (2003, 2004). These earlier outlines were chiefly based morphological characteristics. With the use of molecular data, a more natural classification was developed and published as the *Outlines of the Ascomycota* (Lumbsch and Huhndorf 2007, 2010). The most recent update is that of Wijayawardene et al. (2018a). The outlines of the 1980s and 2018, however, are very different with each other, but both of them provided a working model that other mycologists could strive to confirm or modify. The outlines in 2007 and 2010 only included sexual morphs, whereas the 2018 outline was the first to include asexual morphs with links provided by Hyde et al. (2011) and Wijayawardene et al. (2012, 2017), and is becoming a stable system with continual updates (Wijayawardene et al. 2018a, b). Notes and outlines of the early diverging fungi were provided by Wijayawardene et al. (2018b). Studies on Basidiomycota on the other hand, have not followed such an approach, in spite of there being a real need for this to happen. Notes on all genera of Basidiomycota and an *Outline of the Basidiomycota* are urgently needed. Once such outline is in place, it can be modified and improved, much like the outline of Ascomycota, until it also becomes stable. We therefore provide an account of all genera of Basidiomycota with short notes on basic taxonomic information and references to recent studies. We expect this to be followed by an outline of the Fungi (Wijayawardene et al. 2019) and this to be continually updated, perhaps on a 2–3 year basis, until we reach a consensus for the classification of all of the Fungi.

Basidiomycota constitute a major phylum of the kingdom Fungi and is second in species numbers to the Ascomycota (Wijayawardene et al. 2017, 2018a). Other phyla are Aphelidiomycota, Blastocladiomycota, Calcarisporiellomycota, Chytridiomycota, Entomophthoromycota, Entorrhizomycota, Glomeromycota, Kickxellomycota, Microsporidiomycota, Mortierellomycota, Mucoromycota, Olpidiomycota, Rozellomycota and Zoopagomycota (Tedersoo et al. 2018), although the acceptance of some phyla is disputed (Spatafora et al. 2016).

Species of Basidiomycota are characterized by basidia as meiosporocysts in the sexual life stage. Karyogamy and meosis proceed in the basidia and basidiospores are produced. The basidiomycetous hyphae, which have an electron-dense (multi-layered or visually single-layered) wall, are divided by septa into mononucleate, binucleate, or multinucleate segments. The septal pore may resemble a simple pore as in the Ascomycota, being closed with a compact electron-dense formation, but for many representatives it has a thickening on both sides, appearing barrel-like (doliolum) in electronic microphotographs. The basidiomycetous cell wall is composed of chitin, whose fibrils are immersed in a matrix formed of $(1 \rightarrow 3) - / \beta(1 \rightarrow 6)\beta$–glucans and also mannans in yeast cells. Unlike the ascomycetes, the guanine-cytosine content of the total DNA typically exceeds 50% in basidiomycetous species. In addition, basidiomycetes differ from ascomycetes in a number of biochemical traits, such as the formation of urease, siderochromes, and the type of ubiquinone system, which enables, for example, a clear distinction between basidiomycete and ascomycete yeasts. Like in all dikarya, mitosis in basidiomycetes proceeds with preservation of the nuclear membrane (intranuclear pleuromitosis) and only in some Urediniomycetes, the nuclear membrane partially degrades during mitosis (semi-open pleuromitosis). The nuclear spindle polar bodies in some early divering basidiomycetes, as well as in ascomycetes are discoid, but many representatives have hemispherical and bi-globular spindle polar bodies (Zmitrovich and Wasser 2011). Agaricomycotina produce macroscopic structures for sexual reproduction (basidioma) which are typical mushrooms, boletes, puffballs, earthstars or other structures and may be above ground or sequestrate. Some taxa do not seem to form basidioma but are nevertheless members of the Basidiomycota. These taxa include rusts and smuts, which comprise Pucciniomycotina and Ustilaginomycotina. Yeasts-forming taxa, which are usually found in their asexual life mode, are also members of Basidiomycota, and can be found in all these three subphyla. According to the latest version of Ainsworth & Bisby's Dictionary of the Fungi (Kirk et al. 2008), there are 1589 genera and more than 30,000 species of Basidiomycota, which comprise nearly 32% of all described fungal taxa (Dai et al. 2015).

Since the last edition of Ainsworth & Bisby's Dictionary of the Fungi (Kirk et al. 2008), numerous sequenced-based studies have enabled the introduction of a vast array of new taxa, which has greatly enriched the known diversity of Basidiomycota. At the same time, related new taxonomic categories have been proposed. For example, in phylogenetic studies of basidiomycetous yeasts, three new classes Malasseziomycetes, Moniliellomycetes, and Spiculogloeomycetes, were introduced as well as three new orders, 16 new families, and 47 new genera (Nasr et al. 2014a; Wang et al. 2014a, 2015d, e; Liu et al. 2015b; Riess et al. 2016). On the other hand, many new changes have also occurred in the Agaricomycotina. Approximately 60 new genera have been recognized for agarics, 40 for boletes, and 50 for bracket fungi (Desjardin et al. 2009; Hjortstam and Ryvarden 2010a; Petersen and Hughes

2010; Cui et al. 2011b; Vellinga et al. 2011; Vizzini et al. 2011a; Hao et al. 2014; Hofstetter et al. 2014; Smith et al. 2015; Castellano et al. 2016; Henkel et al. 2016; Wu et al. 2016e; Buyck et al. 2017; Orihara and Smith 2017).

Several studies have focused on contributions to fungal diversity. Such as the Fungal Diversity Notes series, which is already in it 10th contribution, and introduced two new families, two new genera, and 135 new species of Basidiomycota (e.g. Hyde et al. 2017a, b; Tibpromma et al. 2017). Besides, the Fungal Planet series (e.g. Crous et al. 2015a), Fungal Diversity Profiles series (Adamcík et al. 2015), and Fungal Systematics and Evolution series (e.g. Krisai-Greilhuber et al. 2017) have also provided additions to basidiomycete diversity. Since Kirk et al. (2008), a large amount of knowledge on Basidiomycota has been published, thus it is essential and pragmmatic to compile it into a single document. Therefore, the present work provides notes for each genus of Basidiomycota with updates since 2008, including basic information and the latest related taxonomic studies. In addition, an outline of the Basidiomycota is also provided based on the latest systematic studies.

Deciphering and uncovering evolutionary relationships of organisms are underlying topics for taxonomists (Samarakoon et al. 2016). Molecular phylogenies have provided increased knowledge concerning the evolution of fungi (McTaggart et al. 2016a; Kijpornyongpan et al. 2018; Varga et al. 2019). Studies over the last decade used innovative methods to support traditional morphology-based classifications (e.g. Lutzoni et al. 2004; Blackwell et al. 2006; James et al. 2006; Hibbett et al. 2007) and many new perspectives have been derived in fungal systematics. Divergence times have recently been used as important criteria to rank taxa and have been accepted in many fungal systematic studies (Drummond et al. 2012; Hongsanan et al. 2017; Liu et al. 2017c). Zhao et al. (2016f) used divergence times as an additional criterion to infer a modern taxonomic system for the genus *Agaricus*. The authors proposed the following criteria to rank taxa above species level: (i) the taxa must be monophyletic and statistically well-supported in multi-gene analyses; (ii) their respective stem ages should be roughly equivalent, and higher taxon stem ages must be older than lower level taxa stem ages; and (iii) the taxa should be identifiable phenotypically, whenever possible. Subsequently, several studies have ranked higher taxa using divergence times, such as for Ascomycota (Dothideomycetes and Sordariomycetes), Basidiomycota and for the kingdom Fungi (Hongsanan et al. 2017; Hyde et al. 2017a; Liu et al. 2017c; Zhao et al. 2017c; Tedersoo et al. 2018). The time ranges for Basidiomycota, with the phylum originating ca. 530 Mya, the subphyla 406–490 Mya, most classes 245–393 Mya and orders 120–290 Mya were inferred by Zhao et al. (2017c).

In the present study, we provide three maximum clade credibility (MCC) trees for the four subphyla (Agaricomycotina, Pucciniomycotina, Ustilaginomycotina and Wallemiomycotina) in Basidiomycota. The molecular clock analyses are executed to resolve taxonomic problems with estimated divergence times for the well-supported taxa at different taxonomic levels.

Materials and methods

Notes and outline

All generic names gathered from Index Fungorum (2019) were checked through Kirk et al. (2008, 2013) and Species Fungorum (2019). Nomina invalida, nomina rejicienda and synonyms were excluded. The basic information of each note is classification (family, order, class), synonyms, accepted species number, type species, life mode, habitat, distribution, and sequence information. Species numbers are based on Kirk et al. (2008), plus new taxa and data published between 2008 and 2019. Furthermore, the latest research information for each note is in three parts if available: (i) studies of selected important species (edible, medicinal, industrial, pathogenic and saprobic); (ii) selected studies on taxonomy and phylogeny published between 2008 and 2019; (iii) new taxon studies between 2008 and 2019.

Phylogenetic analyses

Sequences were downloaded from GenBank (Benson et al. 2017). Six genes (LSU, SSU, 5.8s, ef1, rpb1 and rpb2) were included in this study. Only species for which two or more gene sequences were available were included in the phylogenetic analyses. Sequence information is listed in Supplementary Table 1. Sequences were checked in BioEdit V.7.0.4 first (Hall 2007). Alignments were made by Muscle 3.8.31 (Edgar 2004) for each region separately, then adjusted manually. In order to avoid substitutional saturation in third codon position, we used translated amino acid sequences for ef1, rpb1 and rpb2 (Matheny et al. 2007b). For each data set, we then combined with DNA from rDNA genes and amino acid sequences. Divergence times were estimated in BEAST 1.8.4 (Drummond et al. 2012). An XML file was constructed with BEAUTI v1.8., and per-gene alignments were imported as separate partitions. Clock and substitution models were set to be unlinked (independently estimated for each gene partition). Substitution models for nucleotides were determined from

jModelTest v2 and the settings were as follows: for the Agaricomycotina tree, the GTR + I+G for SSU, LSU and 5.8S and WAG for ef1, rpb1 and rpb2; for Pucciniomycotina, GTR for LSU and 5.8S, HKY for SSU and WAG for ef1, rpb1 and rpb2; for Ustinaginomycotina, GTR for LSU, SSU and 5.8S, and WAG for ef1, rpb1 and rpb2. A Yule speciation model was selected as prior assuming a constant speciation rate per lineage. We used the uncorrelated lognormal relaxed clock model, specifying a gamma distribution for the ulcd.mean parameter with a shape of 1.0, scale of 0.001, and offset 0. The calibrations of each tree are cited from the previous study (Zhao et al. 2017c) by applying a normal distribution prior (SD = 1) that mean age 406 Mya for Agaricomycotina, Pucciniomycotina, and 430 Mya for Ustilaginomycotina. We ran four independent Monte Carlo Markov Chains of 50 million generations for each, logging states every 10,000 generations. Log files were checked for convergence and mixing in Tracer v1.6 (Rambaut and Drummond 2013; http://tree.bio.ed.ac.uk/software/tracer/). A Maximum-clade-credibility (MCC) tree was summarized using TreeAnnotator 1.8, discarding 10% of states as burn-in and annotating clades with ≥ 0.8 posterior probability (PP).

Results

The phylogenetic and dating analyses of Basidiomycota were conducted based on three datasets, composed of six-gene (LSU, SSU, 5.8s, rpb1, rpb2, ef1) sequences from species of subphyla Agaricomycotina, Pucciniomycotina, Ustilaginomycotina and Wallemiomycotina.

The phylogeny and divergence time analyses of Agaricomycotina

In the phylogenetic analyses of Agaricomycotina, 430 species from Agaricomycotina and six outgroup species from Pucciniomycotina were included. Those species belong to three classes, 26 orders, 98 familes and 412 genera. Figure 1 shows the backbone-constrained tree at the order level, and Fig. 2 is the same tree with more detail at the family and genus levels. Generally, orders and higher taxa including Agaricomycetes, Dacrymycetes and Tremellomycetes were well supported (Fig. 1). However, the subclass Agaricomycetidae, comprising by Agaricales, Amylocorticiales, Atheliales, Boletales and Jaapiales, did not receive statistic support. Phallomycetidae, comprising Hysterangiales, Phallales, Gomphales and Geastrales, was monophyletic with 0.9 PP support. The phylogenetic relationships of the main clades in Boletales roughly agree with Binder and Hibbett 2006 which gave a phylogenetic relationships among suborders based on a five-genes dataset. In Boletacae, Zangiodeae represented by *Zangia* and *Harrya* is recognized and supported statistically, which agrees with Wu et al. (2014b). However, phylogenetic relationships of the other genera are not resolved because of low statistical support. The well-supported taxa were dated with an estimated divergence time for Agaricomycotina as 406 Mya; the classes ranged from 298–341 Mya; and orders from 108–259 Mya (Table 1).

The analyses involving Agaricomycetes comprised 77 families and 352 genera, the Dacrymycetes cmprised three families and six genera, and the Tremellomycetes with 18 families and 54 genera (Fig. 2). A total of 45 monophyletic families were recognized with well-supported PP values, and these families belong to 14 orders as Agaricales, Boletales, Cystofilobasidiales, Dacrymycetales, Filobasidiales, Gomphales, Hymenochaetales, Hysterangiales, Phallales, Polyporales, Russulales, Thelephorales, Tremellales and Trichosporonales. The divergence times of these well-supported families were estimated, ranging from 27 to 178 Mya (Table 1).

The phylogeny and divergence time analyses of Pucciniomycotina

For the phylogenetic analyses of Pucciniomycotina, the MCC tree was generated from the six-gene sequences of 125 species from Pucciniomycotina and six species from Agaricomycotina as the outgroup (Fig. 3). In this tree, Pucciniomycetes comprised four orders, 17 families, 56 genera, and occupied the base position; whilst Agaricostilbomycetes, Atractiellomycetes, Classiculomycetes, Cystobasidiomycetes, Microbotryomycetes, Mixiomycetes, Spiculogloeomycetes and Tritirachiomycetes comprised of 16 orders, 24 families and 61 genera formed a clade without statistical support.

All classes and orders were monophyletic with high supports. The classes originated from 211 to 383 Mya and orders from 128 to 244 Mya. Families in Agaricostilbales (Agaricostilbaceae, Chionosphaeraceae, Kondoaceae and Ruineniaceae), Microbotryales (Leucosporidiaceae, Microbotryaceae and Ustilentylomataceae), Pucciniales (Coleosporiaceae, Mikronegeriaceae, Phakopsoraceae, Phragmidiaceae, Pileolariaceae, Pucciniaceae, Raveneliaceae, and Sphaerophragmiaceae), and Platygloeales (Eocronartiaceae and Platygloeaceae) were well supported and diverged between 85 to 222 Mya. Three monophyletic and highly supported lineages (*Mycogloea* sp./TUBFO40962; *Slooffia tsugae*/JCM 2960 and *Udeniozyma ferulica*/JCM 8231; *Spencerozyma crocea*/CBS 2029 and *Vonarxula javanica*/JCM 9032) did not nest with any known families (Fig. 3). Divergence times of these clades are 266 Mya, 188 Mya and 156 Mya, respectively.

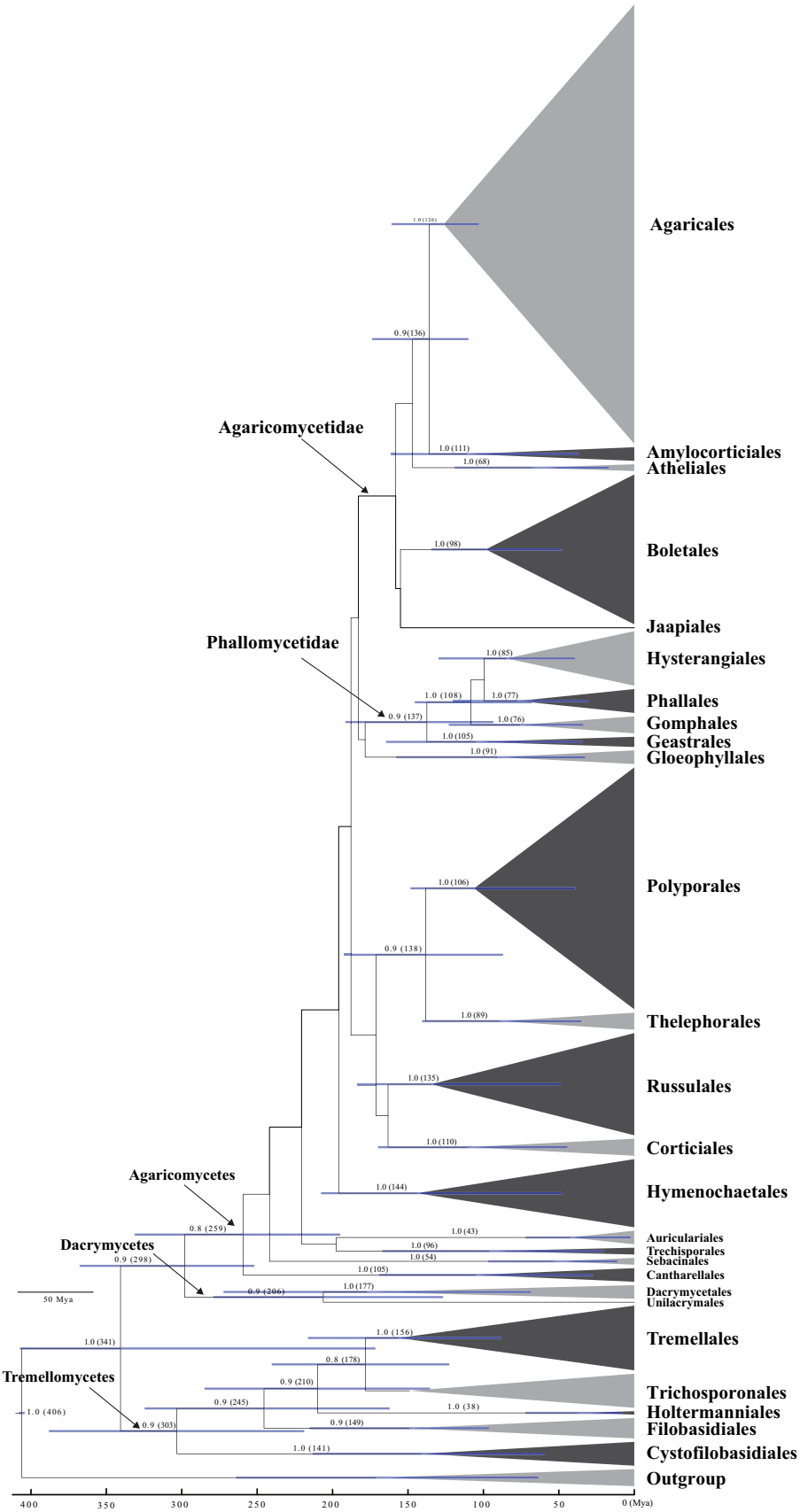


Fig. 1 Maximum Clade Credibility tree showing the relationships among classes and orders of Agaricomycotina based on LSU, SSU, rpb1, rpb2, 5.8 s and ef1 genes with Pucciniomycotina as the outgroup. Posterior probabilities equal to or greater than 0.8 are annotated at the internodes. The 95% highest posterior densities of divergence time estimates are marked by horizontal bars

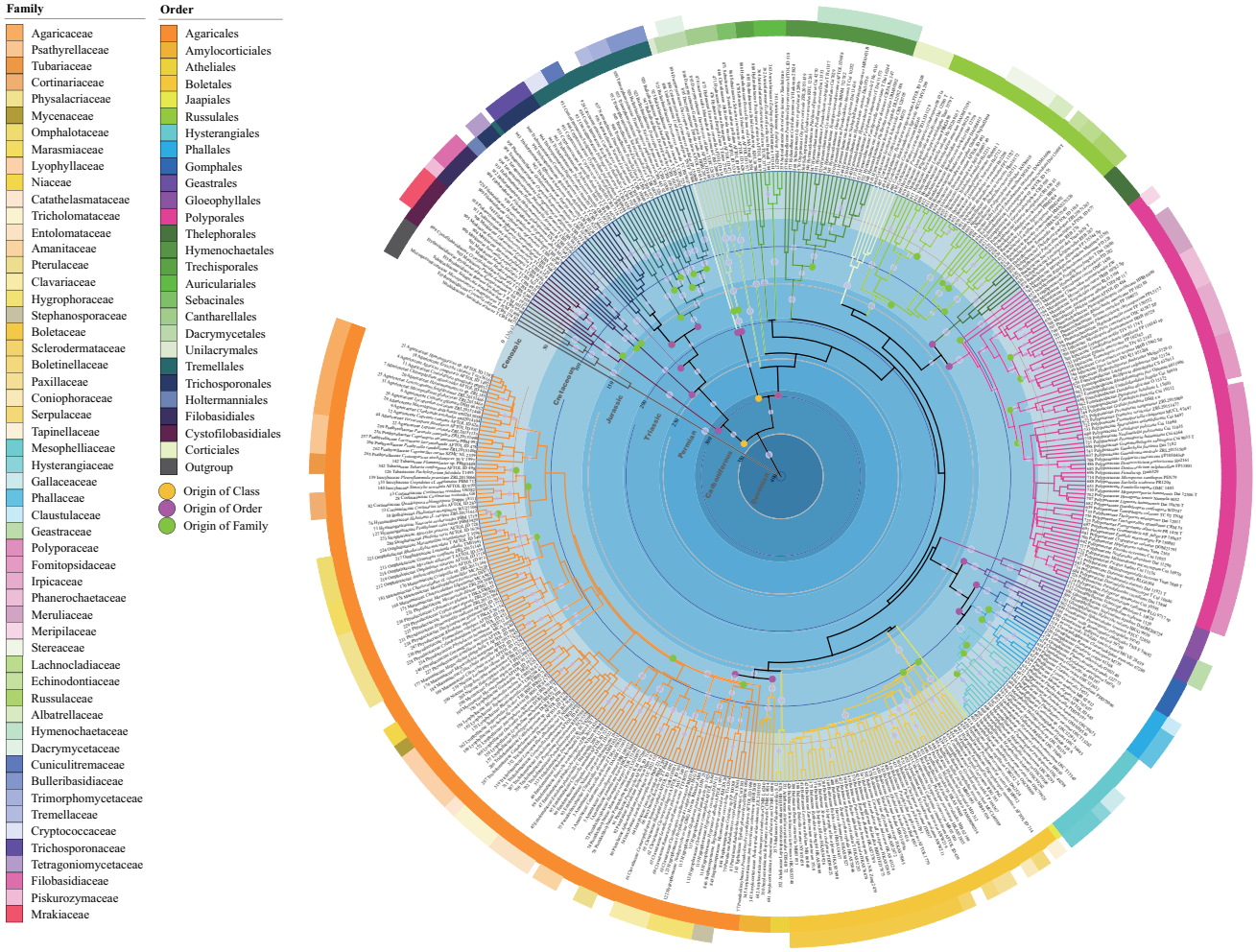


Fig. 2 Maximum Clade Credibility tree of Agaricomycotina based on LSU, SSU, rpb1, rpb2, 5.8 s and ef1 genes with Pucciniomycotina as the outgroup. Posterior probabilities that are equal to or greater than 0.8 are annotated at the internodes as purple dots. The coloured dots refer to the positions of the mean stem age of classes, orders and families respectively

The phylogeny and divergence time analyses of Ustilaginomycotina and Wallemiomycotina

In the phylogenetic analyses of Ustilaginomycotina, a six-gene (LSU, SSU, 5.8s, rpb1, rpb2 and ef1) dataset was used, which comprised of 74 species from Ustilaginomycotina, three species from Wallemiomycotina, and two species from Pucciniomycotina as the outgroup. Wallemiomycotina occupied the basal position with strong support with a divergence time of 430 Mya in MCC tree (Fig. 4). There were four classes In Ustilaginomycotina, of which Moniliellomycetes and Malasseziomycetes were each represented by a single sample. Ustilaginomycetes included four orders, 12 families and 45 genera and formed a strongly-supported monophyletic clade. Exobasidiomycetes was polyphyletic and comprised seven orders, 13 families and 27 genera. The estimated divergence time for Ustilaginomycotina was 430 Mya, orders originated from 172 to 260 Mya and families originated from 79 to 177 Mya.

There were also several well-supported lineages with similar divergence times to those of families in Ustilaginomycotina, but they did not nest within any known family. They are two clades in Ustilaginales, one formed by *Farysia acheniorum*/AS 2 3198, *Farysizyma itapuensis*/BI120, *Schizonella melanogramma*/CBS174 42, *Stegocintractia luzulae*/MP2340 and *Shivasia solida*/H.U.V.17649 with a divergence time of 114 Mya, and another one includes *Moreaua bulbostylidis*/56581 (M) with a divergence time of 114 Mya. One clade in Microstromatales comprising *Jaminaea angkoriensis*/C5b and *Sympodiomycopsis kandeliae*/CBS 10858 had a divergence time of 98 Mya (Table 2).

Table 1 Divergence times of estimated taxa in Basidiomycota

Subphylum	Class	Order (number of families in this study/the total known families)	Families recognized in this study	Mean of stem age in MCC tree (Mya)
Agaricomycotina				406
	Agaricomycetes			298
		Agaricales (24/38)		136
			Agaricaceae	125
			Amanitaceae	125
			Clavariaceae	125
			Cortinariaceae	70
			Entolomataceae	125
			Hygrophoraceae	125
			Hymenogastraceae	27
			Mycenaceae	125
			Niaceae	125
			Omphalotaceae	71
			Physalacriaceae	125
			Psathyrellaceae	125
			Stephanosporaceae	125
			Tubariaceae	54
		Amylocorticiales (1/1)		136
			Amylocorticiaceae	136
		Atheliales (1/1)		259
			Atheliaceae	259
		Auriculariales (2/2)		259
			Auriculariaceae	259
		Boletales (12/16)		259
			Boletaceae	98
			Boletinellaceae	98
			Paxillaceae	98
			Sclerodermataceae	38
			Serpulaceae	98
			Tapinellaceae	98
		Cantharellales (1/6)		259
			Hydnaceae	259
		Corticiales (1/4)		259
			Corticiaceae	259
		Geastrales (1/2)		137
			Geastraceae	137
		Gloeophyllales (1/1)		259
			Gloeophyllaceae	259
		Gomphales (3/3)		108
		Hymenochaetales (4/7)		259
			Hymenochaetaceae	124
		Hysterangiales (5/5)		108
			Gallaceaceae	67
			Mesophelliaceae	54
		Jaapiales (1/1)		259
			Jaapiaceae	259
		Phallales (2/3)		108
			Claustulaceae	77

Table 1 (continued)

Subphylum	Class	Order (number of families in this study/the total known families)	Families recognized in this study	Mean of stem age in MCC tree (Mya)
			Phallaceae	77
		Polyporales (8/18)		138
			Fomitopsidaceae	88
			Irpicaceae	62
			Meruliaceae	81
			Meripilaceae	106
			Phanerochaetaceae	62
			Polyporaceae	88
		Russulales (7/9)		259
			Albatrellaceae	134
			Echinodontiaceae	70
			Peniophoraceae	70
			Russulaceae	97
			Stereaceae	61
		Sebacinales (2/2)		259
			Sebacinaceae	259
		Thelephorales (2/4)		138
		Trechisporales (1/1)		259
			Hydnodontaceae	259
	Dacrymycetes			298
		Dacrymycetales (2/2)		206
			Cerinomycetaceae	
		Unilacrymales (1/1)		206
			Unilacrymaceae	
	Tremellomycetes			341
		Cystofilobasidiales (2/2)		303
		Filobasidiales (2/2)		245
			Filobasidiaceae	149
			Piskurozymaceae	149
		Holtermanniales (1/1)		210
			Holtermanniaceae	210
		Tremellales (11/12)		178
			Bulleribasidiaceae	113
			Cryptococcaceae	113
			Cuniculitremaceae	120
			Tremellaceae	156
		Trichosporonales (2/2)		178
			Trimorphomycetaceae	178
Pucciniomycotina				406
	Agaricostilbomycetes			295
		Agaricostilbales (4/4)		266
			Agaricostilbaceae	180
			Chionosphaeraceae	162
			Kondoaceae	222
			Ruineniaceae	198
	Atractiellomycetes			383
		Atractiellales (1/3)		383
			Phleogenaceae	383

Table 1 (continued)

Subphylum	Class	Order (number of families in this study/the total known families)	Families recognized in this study	Mean of stem age in MCC tree (Mya)
	Classiculomycetes			383
		Classiculales (1/1)		383
			Classiculaceae	383
	Cystobasidiomycetes			211
		Cystobasidiales (1/1)		128
			Cystobasidiaceae	128
		Buckleyzymales (1/1)		128
			Buckleyzymaceae	128
		Erythrobasidiales (1/1)		128
			Erythrobasidiaceae	83
	Microbotryomycetes			286
		incertae sedis (1/3)		
			Chrysozymaceae	156
		Kriegeriales (1/1)		–
			Kriegeriaceae	–
		Microbotryales (3/3)		156
		Leucosporidiales (1/1) (Syn. of Microbotryales in this study)	Leucosporidiaceae	71
			Microbotryaceae	42
			Ustilentylomataceae	42
		Sporidiobolales (1/1)		156
			Sporidiobolaceae	156
	Mixiomycetes			286
		Mixiales (1/1)		286
			Mixiaceae	286
	Pucciniomycetes			383
		Pucciniales (10/15)		275
			Coleosporiaceae	84
			Mikronegeriaceae	196
			Phakopsoraceae	131
			Phragmidiaceae	119
			Pileolariaceae	–
			Pucciniaceae	98
			Raveneliaceae	131
			Sphaerophragmiaceae	114
		Platygloeales (2/2)		185
			Eocronartiaceae	85
			Platygloeaceae	85
		Septobasidiales (1/1)		185
			Septobasidiaceae	185
		Helicobasidiales (1/1)		201
			Helicobasidiaceae	201
	Spiculogloeomycetes			211
		Spiculogloeales (1/1)		211
			Spiculogloeaceae	211
	Tritirachiomycetes			295
		Tritirachiales (1/1)		295
			Tritirachiaceae	295

Table 1 (continued)

Subphylum	Class	Order (number of families in this study/the total known families)	Families recognized in this study	Mean of stem age in MCC tree (Mya)
Ustilaginomycotina				430
	Exobasidiomycetes			–
		Ceraceosorales (1/1)		260
			Ceraceosoraceae	260
		Microstromatales (3/3)		238
			Quambalariaceae	71
			Volvocisporiaceae	98
		Tilletiales (2/2)		185
			Erratomycetaceae	117
			Tilletiaceae	117
		Golubeviales (1/1)		185
			Golubeviaceae	185
		Robbauerales (1/1)		238
			Robbaueraceae	238
		Doassansiales (2/3)		–
			Doassansiaceae	102
			Rhamphosporaceae	102
		Exobasidiales (4/5)		319
			Brachybasidiaceae	130
			Cryptobasidiaceae	211
			Exobasidiaceae	161
			Graphiolaceae	130
		Georgefischeriales (3/4)		–
			Gjaerumiaceae	120
			Tilletiariaceae	79
	Malasseziomycetes			–
		Malasseziales (1/1)		–
			Malasseziaceae	–
	Moniliellomycetes			–
		Moniliellales (1/1)		–
			Moniliellaceae	–
	Ustilaginomycetes			260
		Ustilaginales (5/9)		204
			Melanotaeniaceae	177
			Ustilaginaceae	114
			Websdaneaceae	150
		Urocystidales (5/6)		204
			Doassansiopsidaceae	123
			Fereydouniaceae	123
			Floromycetaceae	61
			Glomosporiaceae	151
			Urocystidaceae	61
		Violaceomycetales (1/1)		172
			Violaceomycetaceae	172
		Uleiellales (1/1)		172
			Uleiellaceae	172
Wallemiomycotina				430
	Wallemiomycetes			430

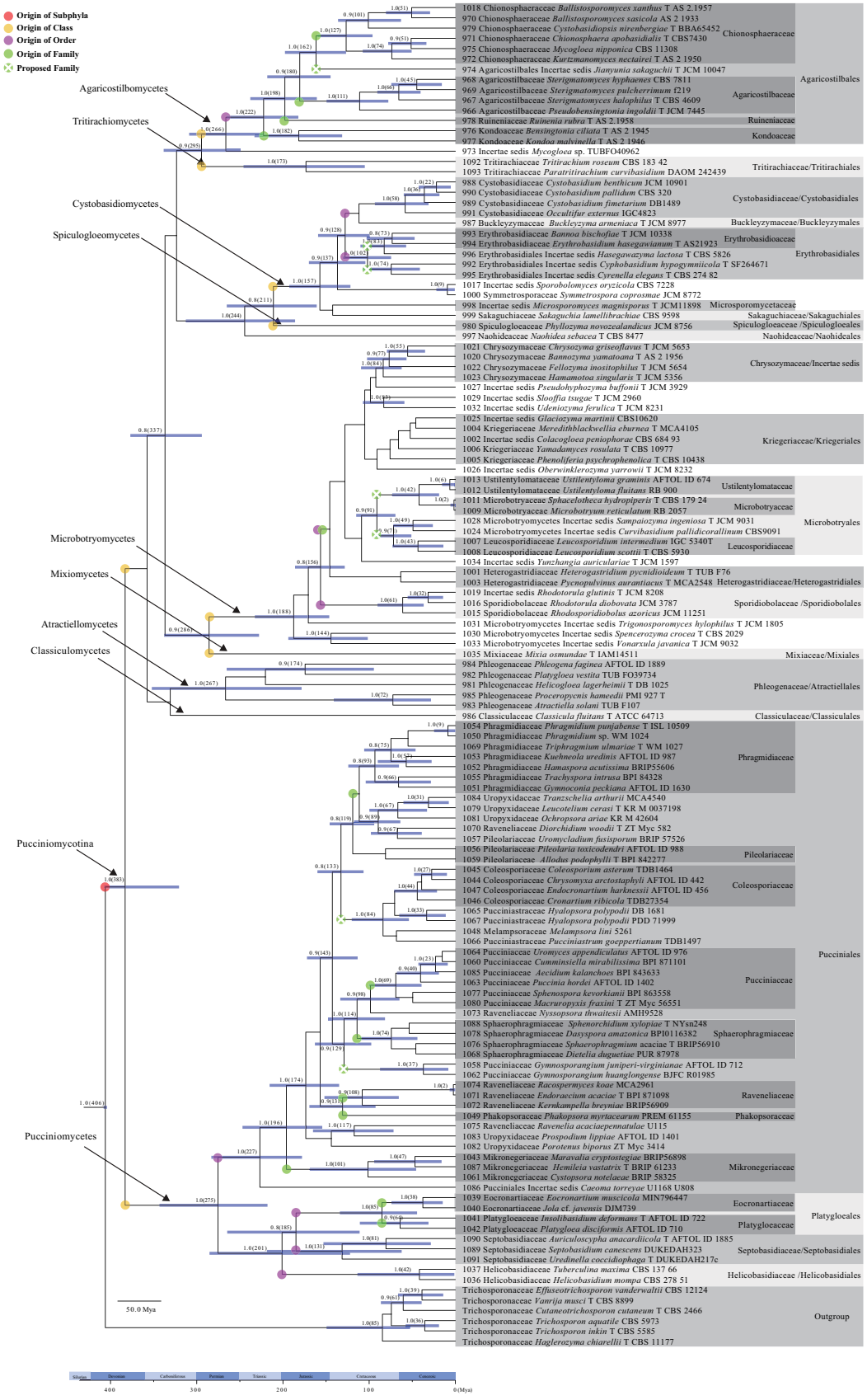
Table 1 (continued)

Subphylum	Class	Order (number of families in this study/the total known families)	Families recognized in this study	Mean of stem age in MCC tree (Mya)
		Geminibasidiales (1/1)		258
			Geminibasidiaceae	258
		Wallemiales (1/1)		258
			Wallemiaceae	258

"–" refer to the families failed to be dated because of the unsupported PP values

Outline of Basidiomycota

Phylum Basidiomycota R.T. Moore 1980
Subphylum Agaricomycotina Doweld 2001
Class Agaricomycetes Doweld 2001
Order Agaricales Underw. 1899
Family Agaricaceae Chevall. 1826
Abstoma G. Cunn. 1926
Acutocapillitium P. Ponce de León 1976
Agaricus L. 1753
= *Araneosa* Long 1941
= *Gyrophragmium* Mont. 1843
= *Hypophyllum* Paulet 1793
= *Longula* Zeller 1945
= *Psalliota* (Fr.) P. Kumm. 1871
= *Pratella* (Pers.) Gray 1821
Arachnion Schwein. 1822
= *Scoleciocarpus* Berk. 1843
Barcheria T. Lebel 2004
Battarrea Pers. 1801
= *Dendromyces* Libosch. 1810
= *Sphaericeps* Welw. & Curr. 1868
Battarreoides T. Herrera 1953
= *Battarraeastrum* R. Heim & T. Herrera 1960
Calvatiopsis Hollós 1929
Chamaemyces Battarra ex Earle 1909
= *Drosella* Maire 1935
= *Lepiotella* (E.-J. Gilbert) Konrad 1934
Chlamydopus Speg. 1898
Chlorolepiota Sathe & S.D. Deshp. 1979
Chlorophyllum Massee 1898
Clarkeinda Kuntze 1891
= *Chitonia* (Fr.) P. Karst. 1879
= *Chitoniella* Henn. 1898
= *Chitonis* Clem. 1909
Clavogaster Henn. 1896
Coniolepiota Vellinga 2011
Coprinus Pers. 1797
= *Coprinusella* (Peck) Zerov 1979
= *Onchopus* P. Karst. 1879
Crucispora E. Horak 1971
Cystolepiota Singer 1952
= *Pulverolepiota* Bon 1993
Dictyocephalos L.M. Underwood ex V.S. White 1901
= *Battarreopsis* Henn. 1902
= *Whetstonia* Lloyd 1906
Disciseda Czern. 1845
= *Bovistina* Long & Stouffer 1941
= *Catastoma* Morgan 1892
Echinoderma (Locq. ex Bon) Bon 1991
Endolepiotula Singer 1963
Eriocybe Vellinga 2011
Gasterellopsis Routien 1940
Glyptoderma R. Heim & Perr.-Bertr. 1971
Heinemannomyces Watling 1999
Hiatulopsis Singer & Grinling 1967
Holocotylon Lloyd 1906
Hymenagaricus Heinem. 1981
Janauaria Singer 1986
Japonogaster Kobayasi 1989
Lepiota (Pers.) Gray 1821
= *Amogaster* Castellano 1995
= *Cribrospora* Pacioni & P. Fantini 2000
= *Cryptolepiota* Kropp & Trappe 2012
= *Fusispora* Fayod 1889
= *Lepiota* P. Browne 1756
= *Lepiotula* (Maire) Locq. ex E. Horak 1968
= *Morobia* E. Horak 1979
Leucoagaricus Locq. ex Singer 1948
= *Sericeomyces* Heinem. 1978
Leucocoprinus Pat. 1888
= *Mastocephalus* Battarra ex Earle 1909
Lycoperdopsis Henn. 1900
Macrolepiota Singer 1948
= *Lepiotella* Rick 1938
= *Volvolepiota* Singer 1959
Melanophyllum Velen. 1921
= *Chlorosperma* Murrill 1922
= *Chlorospora* Massee 1898
= *Glaucospora* Rea 1922
Metrodia Raithelh. 1971
Micropsalliota Höhn. 1914
= *Allopsalliota* Nauta & Bas 1999


Origin of Subphyla
Origin of Class
Origin of Order
Origin of Family
Proposed Family
Agaricostilbomycetes
Tritirachiomycetes
Cystobasidiomycetes
Spiculogloeomycetes
Microbotryomycetes
Mixiomycetes
Atractiellomycetes
Classiculomycetes
Pucciniomycotina
Pucciniomycetes
1018 Chionosphaeraceae Ballistosporomyces xanthus T AS 2.1957
970 Chionosphaeraceae Ballistosporomyces sasicola AS 2 1933
979 Chionosphaeraceae Cystobasidiopsis nirenbergiae T BBA65452
971 Chionosphaeraceae Chionosphaera apobasidialis T CBS7430
975 Chionosphaeraceae Mycogloea nipponica CBS 11308
972 Chionosphaeraceae Kurtzmanomyces nectairei T AS 2 1950
Chionosphaeraceae
974 Agaricostilbales Incertae sedis Jianyunia sakaguchii T JCM 10047
968 Agaricostilbaceae Sterigmatomyces hyphaenes CBS 7811
969 Agaricostilbaceae Sterigmatomyces pulcherrimum f219
967 Agaricostilbaceae Sterigmatomyces halophilus T CBS 4609
966 Agaricostilbaceae Pseudobensingtonia ingoldii T JCM 7445
Agaricostilbaceae
Agaricostilbales
978 Ruineniaceae Ruinenia rubra T AS 2.1958
Ruineniaceae
976 Kondoaceae Bensingtonia ciliata T AS 2 1945
977 Kondoaceae Kondoa malvinella T AS 2.1946
Kondoaceae
973 Incertae sedis Mycogloea sp. TUBFO40962
1092 Tritirachiaceae Tritirachium roseum CBS 183 42
1093 Tritirachiaceae Paratritirachium curvibasidium DAOM 242439
Tritirachiaceae/Tritirachiales
988 Cystobasidiaceae Cystobasidium benthicum JCM 10901
990 Cystobasidiaceae Cystobasidium pallidum CBS 320
989 Cystobasidiaceae Cystobasidium fimetarium DB1489
991 Cystobasidiaceae Occultifur externus IGC4823
Cystobasidiaceae/Cystobasidiales
987 Buckleyzymaceae Buckleyzyma armeniaca T JCM 8977
Buckleyzymaceae/Buckleyzymales
993 Erythrobasidiaceae Bannoa bischofiae T JCM 10338
994 Erythrobasidiaceae Erythrobasidium hasegawianum T AS21923
Erythrobasidiaceae
996 Erythrobasidiales Incertae sedis Hasegawazyma lactosa T CBS 5826
992 Erythrobasidiales Incertae sedis Cyphobasidium hypogymniicola T SF264671
995 Erythrobasidiales Incertae sedis Cyrenella elegans T CBS 274 82
Erythrobasidiales
1017 Incertae sedis Sporobolomyces oryzicola CBS 7228
1000 Symmetrospraceae Symmetrospora coprosmae JCM 8772
998 Incertae sedis Microsporomyces magnisporus T JCM11898
Microsporomycetaceae
999 Sakaguchiaceae Sakaguchia lamellibrachiae CBS 9598
Sakaguchiaceae/Sakaguchiales
980 Spiculogloeaceae Phyllozyma novozealandicus JCM 8756
Spiculogloeaceae /Spiculogloeales
997 Naohideaceae Naohidea sebacea T CBS 8477
Naohideaceae/Naohideales
1021 Chrysozymaceae Chrysozyma griseoflavus T JCM 5653
1020 Chrysozymaceae Bannozyma yamatoana T AS 2 1956
1022 Chrysozymaceae Fellozyma inositophilus T JCM 5654
1023 Chrysozymaceae Hamamotoa singularis T JCM 5356
Chrysozymaceae/Incertae sedis
1027 Incertae sedis Pseudohyphozyma buffonii T JCM 3929
1029 Incertae sedis Slooffia tsugae T JCM 2960
1032 Incertae sedis Udeniozyma feralica T JCM 8231
1025 Incertae sedis Glaciozyma martinii CBS10620
1004 Kriegeriaceae Meredithblackwellia eburnea T MCA4105
1002 Incertae sedis Colacogloea peniophorae CBS 684 93
1006 Kriegeriaceae Yamadamyces rosulata T CBS 10977
1005 Kriegeriaceae Phenoliferia psychrophenolica T CBS 10438
Kriegeriaceae/Kriegeriales
1026 Incertae sedis Oberwinklerozyma yarrowii T JCM 8232
1013 Ustilentylomataceae Ustilentyloma graminis AFTOL ID 674
1012 Ustilentylomataceae Ustilentyloma fluitans RB 900
Ustilentylomataceae
1011 Microbotryaceae Sphaerotheca hydropiperis T CBS 179 24
1009 Microbotryaceae Microbotryum reticulatum RB 2057
Microbotryaceae
1028 Microbotryomycetes Incertae sedis Sampaiozyma ingeniosa T JCM 9031
1024 Microbotryomycetes Incertae sedis Curvibasidium pallidicorallinum CBS9091
1007 Leucosporidiaceae Leucosporidium intermedium IGC 5340T
1008 Leucosporidiaceae Leucosporidium scottii T CBS 5930
Leucosporidiaceae
Microbotryales
1034 Incertae sedis Yunzhangia auriculariae T JCM 1597
1001 Heterogastridiaceae Heterogastridium pycnidioideum T TUB F76
1003 Heterogastridiaceae Pycnopulvinus aurantiacus T MCA2548
Heterogastridiaceae/Heterogastridiales
1019 Incertae sedis Rhodotorula glutinis T JCM 8208
1016 Sporidiobolaceae Rhodotorula diobovata JCM 3787
1015 Sporidiobolaceae Rhodosporidiobolus azoricus JCM 11251
Sporidiobolaceae /Sporidiobolales
1031 Microbotryomycetes Incertae sedis Trigonosporomyces hylophilus T JCM 1805
1030 Microbotryomycetes Incertae sedis Spencerozyma crocea T CBS 2029
1033 Microbotryomycetes Incertae sedis Yonarxula javanica T JCM 9032
1035 Mixiaceae Mixia osmundae T IAM14511
Mixiaceae/Mixiales
984 Phleogenaceae Phleogena faginea AFTOL ID 1889
982 Phleogenaceae Platygloea vestita TUB FO39734
981 Phleogenaceae Helicogloea lagerheimii T DB 1025
985 Phleogenaceae Proceropycnis hameedii PMI 927 T
983 Phleogenaceae Atractiella solani TUB F107
Phleogenaceae/Atractiellales
986 Classiculaceae Classicula fluitans T ATCC 64713
Classiculaceae/Classiculales
1054 Phragmidiaceae Phragmidium punjabense T ISL 10509
1050 Phragmidiaceae Phragmidium sp. WM 1024
1069 Phragmidiaceae Triphragmium ulmariae T WM 1027
1053 Phragmidiaceae Kuehneola uredinis AFTOL ID 987
1052 Phragmidiaceae Hamaspora acutissima BRIP55606
1055 Phragmidiaceae Trachyspora intrusa BPI 84328
1051 Phragmidiaceae Gymnoconia peckiana AFTOL ID 1630
Phragmidiaceae
1084 Uropyxidaceae Tranzschelia arthurii MCA4540
1079 Uropyxidaceae Leucotelium cerasi T KR M 0037198
1081 Uropyxidaceae Ochropsora ariae KR M 42604
1070 Raveneliaceae Diorchidium woodii T ZT Myc 582
1057 Pileolariaceae Uromycladium fusisporum BRIP 57526
1056 Pileolariaceae Pileolaria toxicodendri AFTOL ID 988
1059 Pileolariaceae Allodus podophylli T BPI 842277
Pileolariaceae
1045 Coleosporiaceae Coleosporium asterum TDB1464
1044 Coleosporiaceae Chrysomyxa arctostaphyli AFTOL ID 442
1047 Coleosporiaceae Endocronartium harknessii AFTOL ID 456
1046 Coleosporiaceae Cronartium ribicola TDB27354
Coleosporiaceae
1065 Pucciniastraceae Hyalopsora polypodii DB 1681
1067 Pucciniastraceae Hyalopsora polypodii PDD 71999
1048 Melampsoraceae Melampsora lini 5261
1066 Pucciniastraceae Pucciniastrum goeppertianum TDB1497
1064 Pucciniaceae Uromyces appendiculatus AFTOL ID 976
1060 Pucciniaceae Cumminsiella mirabilissima BPI 871101
1085 Pucciniaceae Aecidium kalanchoes BPI 843633
1063 Pucciniaceae Puccinia hordei AFTOL ID 1402
1077 Pucciniaceae Sphenospora kevorkianii BPI 863558
1080 Pucciniaceae Macruropyxis fraxini T ZT Myc 56551
1073 Raveneliaceae Nyssopsora thwaitesii AMH9528
Pucciniaceae
Pucciniales
1088 Sphaerophragmiaceae Sphenorchidium xylopiae T NYsn248
1078 Sphaerophragmiaceae Dasyspora amazonica BPI0116382
1076 Sphaerophragmiaceae Sphaerophragmium acaciae T BRIP56910
1068 Sphaerophragmiaceae Dietelia duquetiae PUR 87978
Sphaerophragmiaceae
1058 Pucciniaceae Gymnosporangium juniperi-virginianae AFTOL ID 712
1062 Pucciniaceae Gymnosporangium huanglongense BJFC R01985
1074 Raveneliaceae Racospermyces koae MCA2961
1071 Raveneliaceae Endoraecium acaciae T BPI 871098
1072 Raveneliaceae Kernkampella breyniae BRIP56909
Raveneliaceae
1049 Phakopsoraceae Phakopsora myrtacearum PREM 61155
Phakopsoraceae
1075 Raveneliaceae Ravenelia acaciaepennatulae U115
1083 Uropyxidaceae Prospodium lippiae AFTOL ID 1401
1082 Uropyxidaceae Porotenus hiporus ZT Myc 3414
1043 Mikronegeriaceae Maravalia cryptostegiae BRIP56898
1087 Mikronegeriaceae Hemileia vastatrix T BRIP 61233
1061 Mikronegeriaceae Cystopsora notelaeae BRIP 58325
Mikronegeriaceae
1086 Pucciniales Incertae sedis Caeoma torreyae U1168 U808
1039 Eocronartiaceae Eocronartium muscicola MIN796447
1040 Eocronartiaceae Jola cf. javensis DJM739
Eocronartiaceae
1041 Platygloeaceae Insolibasidium deformans T AFTOL ID 722
1042 Platygloeaceae Platygloea disciformis AFTOL ID 710
Platygloeaceae
Platygloeales
1090 Septobasidiaceae Auriculoscypha anacardicola T AFTOL ID 1885
1089 Septobasidiaceae Septobasidium canescens DUKEDAH323
1091 Septobasidiaceae Uredinella coccidiophaga T DUKEDAH217c
Septobasidiaceae/Septobasidiales
1037 Helicobasidiaceae Tuberculina maxima CBS 137 66
1036 Helicobasidiaceae Helicobasidium mompa CBS 278 51
Helicobasidiaceae /Helicobasidiales
Trichosporonaceae Effuseotrichosporon vanderwaltii CBS 12124
Trichosporonaceae Vanrija musci T CBS 8899
Trichosporonaceae Cutaneotrichosporon cutaneum T CBS 2466
Trichosporonaceae Trichosporon aquatile CBS 5973
Trichosporonaceae Trichosporon inkin T CBS 5585
Trichosporonaceae Haglerozyma chiarellii T CBS 11177
Outgroup
50.0 Mya
Silurian
Devonian
Carboniferous
Permian
Triassic
Jurassic
Cretaceous
Cenozoic
400
300
200
100
0 (Mya)

◀**Fig. 3** Maximum Clade Credibility tree of Pucciniomycotina based on LSU, SSU, rpb1, rpb2, 5.8 s and ef1 genes with the Agaricomycotina as outgroup. Posterior probabilities which equal to or greater than 0.8 are annotated at the internodes. The 95% highest posterior density of divergence time estimates are marked by horizontal bars. The coloured dots refer to the positions of the mean stem age of subphyla, classes, orders, families and potentially new families respectively

Montagnea Fr. 1836
Mycenastrum Desv. 1842
= *Endonevrum* Czern. 1845
Neosecotium Singer & A.H. Sm. 1960
Panaeolopsis Singer 1969
Phellorinia Berk. 1843
= *Areolaria* Kalchbr. 1884
= *Cyphellomyces* Speg. 1906

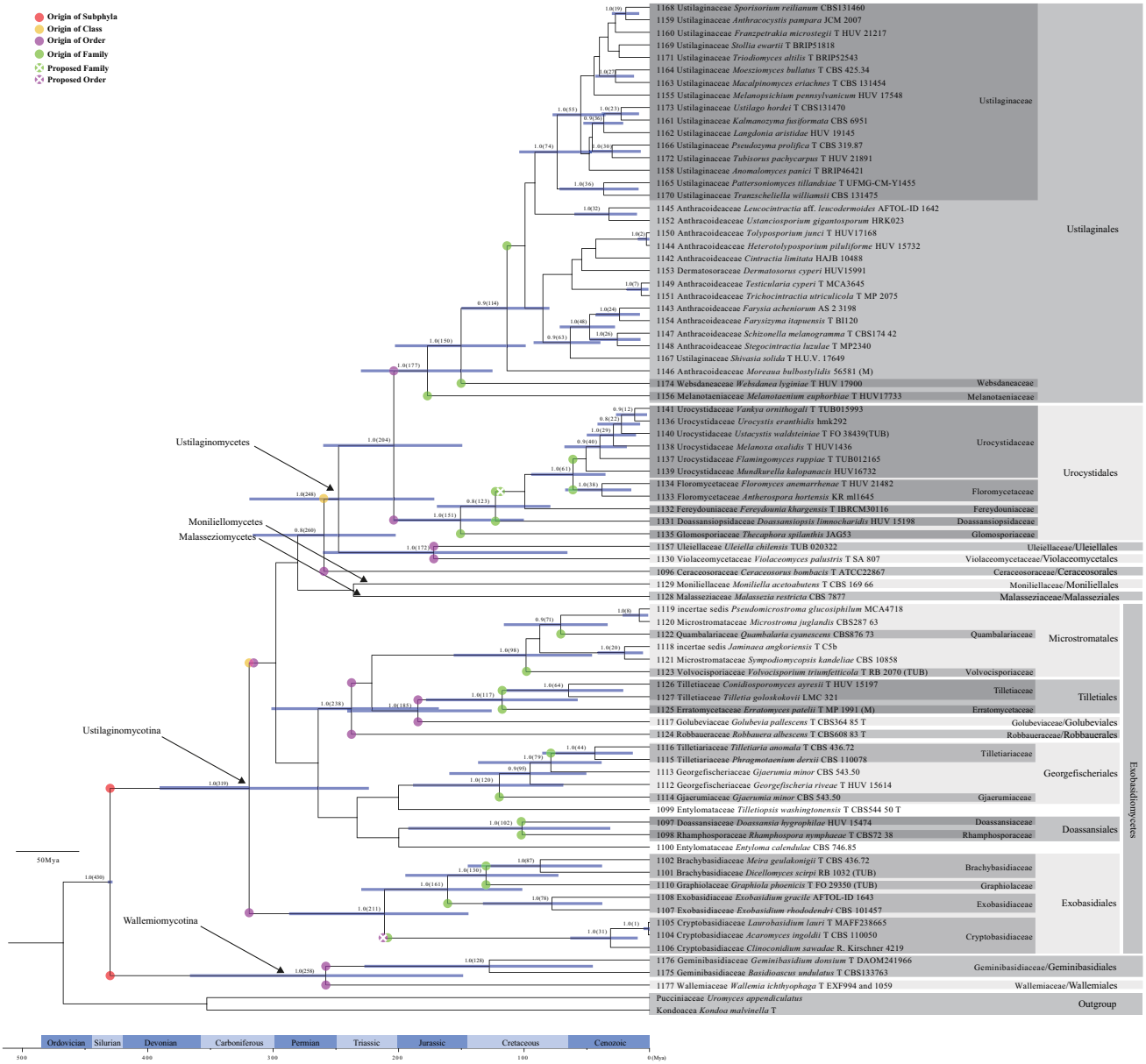


Fig. 4 Maximum Clade Credibility tree of Ustilaginomycotina based on LSU, SSU, rpb1, rpb2, 5.8 s and ef1 genes with Pucciniomycotina as the outgroup. Posterior probabilities which equal to or greater than 0.8 are annotated at the internodes. The 95% highest posterior density of divergence time estimates are marked by horizontal bars. The coloured dots refer to the positions of the mean stem age of subphyla, classes, orders, families, and potentially new families and orders respectively

Table 2 Estimated numbers for taxa in Basidiomycota

Phylum	Subphylum	Class	Order	Family number	Genus number	Species number
Basidiomycota				241	1928	41270
	Agaricomycotina			150	1514	30788
		Agaricomycetes		128	1434	30143
			Agaricales	38	508	17291
			Amylocorticiales	1	10	44
			Atheliales	1	20	102
			Auriculariales	2	41	318
			Boletales	16	141	2022
			Cantharellales	6	37	589
			Corticiales	4	26	115
			Geastrales	2	9	154
			Gloeophyllales	1	13	48
			Gomphales	3	20	410
			Hymenochaetales	7	80	1205
			Hysterangiales	5	20	133
			Jaapiales	1	1	2
			Lepidostromatales	1	3	11
			Phallales	3	34	139
			Polyporales	18	285	2544
			Russulales	9	98	4436
			Sebacinales	3	9	46
			Stereopsidales	1	1	15
			Thelephorales	4	17	321
			Trechisporales	1	16	118
			Tremellodendropsidales	1	1	8
			incertae sedis		44	72
		Dacrymycetes		3	12	146
			Dacrymycetales	2	11	145
			Unilacrymales	1	1	1
		Tremellomycetes		19	68	499
			Cystofilobasidiales	2	7	29
			Filobasidiales	2	7	51
			Holtermanniales	1	2	13
			Tremellales	12	39	336
			Trichosporonales	2	10	61
			incertae sedis		3	9
	Pucciniomycotina			49	270	8653
		Agaricostilbomycetes		4	13	56
			Agaricostilbales	4	13	56
		Atractiellomycetes		3	10	58
			Atractiellales	3	10	58
		Classiculomycetes		1	2	4
			Classiculales	1	2	4
		Cryptomycocolacomycetes		1	2	2
			Cryptomycocolacales	1	2	2
		Cystobasidiomycetes		8	13	62
			Buckleyzymales	1	1	5
			Cystobasidiales	1	2	29

Table 2 (continued)

Phylum	Subphylum	Class	Order	Family number	Genus number	Species number
			Erythrobasidiales	1	5	11
			Naohideales	1	1	1
			Sakaguchiales	1	1	5
			incertae sedis	2	3	11
		Microbotryomycetes		9	42	284
			Heterogastridiales	1	3	2
			Kriegeriales	1	4	7
			Leucosporidiales	1	1	11
			Microbotryales	2	8	170
			Sporidiobolales	1	4	39
			incertae sedis	3	22	55
		Mixiomycetes		1	1	1
			Mixiales	1	1	1
		Pucciniomycetes		20	180	8168
			Helicobasidiales	1	2	32
			Pachnocybales	1	1	1
			Platygloeales	2	9	26
			Pucciniales	15	162	8105
			Septobasidiales	1	6	4
		Spiculogloeomycetes		1	2	12
			Spiculogloeales	1	2	12
		Tritirachiomycetes		1	2	2
			Tritirachiales	1	2	2
		incertae sedis			3	4
	Ustilaginomycotina			42	128	1805
		Exobasidiomycetes		21	56	588
			Ceraceosorales	1	1	3
			Doassansiales	3	13	40
			Entylomatales	1	2	170
			Exobasidiales	5	17	102
			Georgefischeriales	4	7	43
			Golubeviales	1	1	1
			Microstromatales	3	7	37
			Robbauerales	1	1	1
			Tilletiales	2	7	191
		Malasseziomycetes		1	1	21
			Malasseziales	1	1	21
		Moniliellomycetes		1	1	11
			Moniliellales	1	1	11
		Ustilaginomycetes		17	70	1185
			Uleiellales	1	1	3
			Urocystidales	6	13	274
			Ustilaginales	9	53	905
			Violaceomycetales	1	1	1
			incertae sedis		2	2
	Wallemiomycotina			2	4	12
		Wallemiomycetes		2	4	12
			Geminibasidiales	1	2	2

Table 2 (continued)

Phylum	Subphylum	Class	Order	Family number	Genus number	Species number
			Wallemiales	1	1	8
			incertae sedis		1	2
	incertae sedis				12	12

= *Xylopodium* Mont. 1845
Phyllogaster Pegler 1969
Podaxis Desv. 1809
= *Catachyon* (Ehrenb. ex Fr.) Fr. 1832
= *Cauloglossum* Grev. ex Fr. 1829
= *Chainoderma* Massee 1890
= *Schweinitzia* Grev. 1823
Pseudoauricularia Kobayasi 1982
Pseudolepiota Z.W. Ge 2017
Queletia Fr. 1872
Rugosospora Heinem. 1973
Schinzinia Fayod 1889
Schizostoma Ehrenb. ex Lév. 1846
Singerina Sathe & S.D. Deshp. 1981
Smithiogaster J.E. Wright 1975
Smithiomyces Singer 1944
Termiticola E. Horak 1979
Tulostoma Pers. 1794
= *Tulasnodea* Fr. 1849
Xanthagaricus (Heinem.) Little Flower, Hosag. & T.K. Abraham 1997
Xerocoprinus Maire 1907

Family Amanitaceae E.-J. Gilbert 1940
Amanita Pers. 1797
= *Agaricus* Raf. 1830
= *Amanitaria* E.-J. Gilbert 1940
= *Amanitina* E.-J. Gilbert 1940
= *Amanitella* Earle 1909
= *Amanitopsis* Roze 1876
= *Amarrendia* Bougher & T. Lebel 2002
= *Amidella* E.-J. Gilbert 1940
= *Amplariella* E.-J. Gilbert 1940
= *Ariella* E.-J. Gilbert 1940
= *Aspidella* E.-J. Gilbert 1940
= *Boletium* Clem. 1909
= *Lepidella* E.-J. Gilbert 1925
= *Leucomyces* Battarra ex Earle 1909
= *Pseudofarinaceus* Battarra ex Kuntze 1891
= *Saproamanita* Redhead, Vizzini, Drehmel & Contu 2016
= *Torrendia* Bres. 1902
= *Vaginaria* Forq. 1886
= *Vaginarius* Roussel 1806
= *Vaginata* Nees ex Gray 1821
= *Volvella* E.-J. Gilbert & Beeli 1940
= *Volvoamanita* (Beck) E. Horak 1968
= *Volvoboletus* Henn. 1898
Catatrama Franco-Mol. 1991
Limacella Earle 1909
= *Amanitella* Maire 1913
Limacellopsis Zhu L. Yang, Q. Cai & Y.Y. Cui 2018
Zhuliangomyces Redhead 2019
= *Myxoderma* Fayod ex Kühner 1926

Family Bolbitiaceae Singer 1948
Agrogaster D.A. Reid 1986
Bolbitius Fr. 1838
= *Pluteolus* (Fr.) Gillet 1876
Conocybe Fayod 1889
= *Gastrocybe* Watling 1968
= *Pseudoconocybe* Hongo 1967
= *Raddetes* P. Karst. 1887
Cyttarophyllopsis R. Heim 1968
Descolea Singer 1952
= *Descomyces* Bougher & Castellano 1993
= *Hymenangium* Klotzsch 1839
= *Pseudodescolea* Raithelh. 1980
= *Setchelliogaster* Pouzar 1958
= *Timgrovea* G. Cunn. 1993
Galerella Earle 1909
Galeropsis Velen. 1930
= *Cyttarophyllum* (R. Heim) Singer 1936
= *Psammomyces* Lebedeva 1932
Gymnoglossum Massee 1891
Pholiotina Fayod 1889
Ptychella Roze & Boud. 1879
Rhodoarrhenia Singer 1964
Tubariella E. Horak & Hauskn. 2002
Tubariopsis R. Heim 1931
Tympanella E. Horak 1971
Wielandomyces Raithelh. 1988

Family Broomeiaceae Zeller 1948
Broomeia Berk. 1844

Family Biannulariaceae Jülich 1981
= Catathelasmataceae Wasser 1985
Anupama K.N.A. Raj, K.P.D. Latha & Manim. 2019
Callistosporium Singer 1944
Catathelasma Lovejoy 1910
= *Biannularia* Beck 1922

Guyanagarika Sánchez-García, T.W. Henkel & Aime 2016
Macrocybe Pegler & Lodge 1998
Pleurocollybia Singer 1947
Pseudolaccaria Vizzini, Contu & Z.W. Ge 2015

Family Chromocyphellaceae Knudsen 2010
Chromocyphella De Toni & Levi 1888
= *Cymbella* Pat. 1886
= *Phaeocarpus* Pat. 1887
= *Phaeocyphella* Pat. 1900
= *Phaeocyphella* Speg. 1909
Phaeosolenia Speg. 1902

Family Clavariaceae Chevall. 1826
Camarophyllopsis Herink 1958
= *Hygrotrama* Singer 1959
Clavaria Vaill. ex L. 1753
= *Clavaria* P. Micheli 1729
= *Holocoryne* (Fr.) Bonord. 1851
= *Stichoclavaria* Ulbr. 1928
Clavicorona Doty 1947
Clavulinopsis Overeem 1923
= *Donkella* Doty 1950
= *Ramaria* Holmsk. 1790
Hirticlavula J.H. Petersen & Læssøe 2014
Hodophilus R. Heim 1958
Hyphodontiella Å. Strid 1975
Lamelloclavaria Birkebak & Adamčík 2016
Ramariopsis (Donk) Corner 1950
Setigeroclavula R.H. Petersen 1988

Family Cortinariaceae R. Heim ex Pouzar 1983
Cortinarius (Pers.) Gray 1821
= *Bulbopodium* Earle 1909
= *Cereicium* Locq. 1979
= *Cuphocybe* R. Heim 1951
= *Cyanicium* Locq. 1979
= *Cystocybe* Velen. 1921
= *Dermocybe* (Fr.) Wünsche 1877
= *Gomphos* Kuntze 1891
= *Hydrocybe* (Fr. ex Rabenh.) Wünsche 1877
= *Hydrocybium* Earle 1909
= *Hydrotelamonia* Rob. Henry 1957
= *Hygramaricium* Locq. 1979
= *Hygromyxacium* Locq. 1979
= *Inoloma* (Fr.) Wünsche 1877
= *Locellina* Gillet 1876
= *Meliderma* Velen. 1920
= *Myxacium* (Fr.) P. Kumm. 1871
= *Myxopholis* Locq. 1979
= *Phlegmacium* (Fr.) Wünsche 1877
= *Raphanozon* P. Kumm. 1871
= *Rapacea* E. Horak 1999
= *Rozites* P. Karst. 1879
= *Sericeocybe* Rob. Henry 1993
= *Sphaerotrachys* Fayod 1889
= *Squamaphlegma* Locq. 1979
= *Telamonia* (Fr.) Wünsche 1877
= *Thaxterogaster* Singer 1951
= *Volvigerum* (E. Horak & M.M. Moser) R. Heim 1966
= *Weinzettlia* Velen. 1921
Protoglossum Massee 1891
= *Cortinomyces* Bougher & Castellano 1993
Pyrrhoglossum Singer 1944
Quadrispora Bougher & Castellano 1993
Stephanopus M.M. Moser & E. Horak 1975

Family Crassisporiaceae Vizzini, Consiglio & M. Marchetti 2019
Crassisporium Matheny, P.-A. Moreau & Vizzini 2014
Romagnesiella Contu, Matheny, P.-A. Moreau, Vizzini & A. de Haan 2014

Family Crepidotaceae (S. Imai) Singer 1951
Crepidotus (Fr.) Staude 1857
= *Calathinus* Quél. 1886
= *Cyphellathelia* Jülich 1972
= *Dochmiopus* Pat. 1887
= *Octojuga* Fayod 1889
= *Phaeoglabrotricha* W.B. Cooke 1961
= *Phaeomyces* E. Horak 2005
= *Phialocybe* P. Karst. 1879
= *Pleurotellus* Fayod 1889
= *Tremellastrum* Clem. 1909
= *Tremellopsis* Pat. 1903
Episphaeria Donk 1962
Nanstelocephala Oberw. & R.H. Petersen 1990
Pellidiscus Donk 1959
Pleuroflammula Singer 1946
Simocybe P. Karst. 1879
= *Ramicola* Velen. 1929

Family Cyphellaceae Lotsy 1907
Asterocyphella W.B. Cooke 1961
Campanophyllum Cifuentes & R.H. Petersen 2003
Catilla Pat. 1915
Cheimonophyllum Singer 1955
Chondrostereum Pouzar 1959
Cunninghammyces Stalpers 1985
Cyphella Fr. 1822
= *Dendrocyphella* Petch 1922
Gloeocorticium Hjortstam & Ryvarden 1986
Gloeostereum S. Ito & S. Imai 1933
Granulobasidium Jülich 1979
Hyphoradulum Pouzar 1987
Incrustocalyptella Agerer 1983

Phaeoporotheleum (W.B. Cooke) W.B. Cooke 1961
Seticyphella Agerer 1983
Sphaerobasidioscypha Agerer 1983
Thujacorticium Ginns 1988

Family Cystostereaceae Jülich 1982
Cericium Hjortstam 1995
Crustomyces Jülich 1978
Cystidiodontia Hjortstam 1983
Cystostereum Pouzar 1959
Parvobasidium Jülich 1975
Parvodontia Hjortstam & Ryvarden 2004
Rigidotubus J. Song, Y.C. Dai & B.K. Cui 2018

Family Entolomataceae Kotl. & Pouzar 1972
Clitocella Kluting, T.J. Baroni & Bergemann 2014
Clitopilopsis Maire 1937
Clitopilus (Fr. ex Rabenh.) P. Kumm. 1871
= *Hexajuga* Fayod 1889
= *Orcella* Battarra ex Clem. 1896
Entocybe T.J. Baroni, V. Hofst. & Largent 2011
Entoloma P. Kumm. 1871
= *Alboleptonia* Largent & R.G. Benedict 1970
= *Arenicola* Velen. 1947
= *Calliderma* (Romagn.) Largent 1994
= *Claudopus* Gillet 1876
= *Eccilia* (Fr.) P. Kumm. 1871
= *Fibropilus* (Noordel.) Largent 1994
= *Inocephalus* (Noordel.) P.D. Orton 1991
= *Inopilus* (Romagn.) Pegler 1983
= *Latzinaea* Kuntze 1891
= *Leptonia* (Fr.) P. Kumm. 1871
= *Leptoniella* Earle 1909
= *Nigropogon* Coker & Couch 1928
= *Nolanea* (Fr.) P. Kumm. 1871
= *Omphaliopsis* (Noordel.) P.D. Orton 1991
= *Paraeccilia* Largent 1994
= *Paraleptonia* (Romagn. ex Noordel.) P.D. Orton 1991
= *Pouzarella* Mazzer 1976
= *Pouzaromyces* Pilát 1953
= *Rhodocybella* T.J. Baroni & R.H. Petersen 1987
= *Rhodogaster* E. Horak 1964
= *Rhodophyllus* Quél. 1886
= *Richoniella* Costantin & L.M. Dufour 1900
= *Trichopilus* (Romagn.) P.D. Orton 1991
Rhodocybe Maire 1926
Rhodophana Kühner 1971

Family Hemigasteraceae Gäum. & C.W. Dodge 1928
Hemigaster Juel 1895

Family Hydnangiaceae Gäum. & C.W. Dodge 1928
Hydnangium Wallr. 1839
Laccaria Berk. & Broome 1883
= *Russuliopsis* J. Schröt. 1889
Maccagnia Mattir. 1922
Podohydnangium G.W. Beaton, Pegler & T.W.K. Young 1984

Family Hygrophoraceae Lotsy 1907
Acantholichen P.M. Jørg. 1998
Aeruginospora Höhn. 1908
Ampulloclitocybe Redhead, Lutzoni, Moncalvo & Vilgalys 2002
= *Clavicybe* Harmaja 2002
Aphroditeola Redhead & Manfr. Binder 2013
Arrhenia Fr. 1849
= *Boehmia* Raddi 1806
= *Corniola* Gray 1821
= *Dictyolus* Quél. 1886
= *Geotus* Pilát & Svrček 1953
= *Leptotus* P. Karst. 1879
Cantharellula Singer 1936
Cantharocybe H.E. Bigelow & A.H. Sm. 1973
Chromosera Redhead, Ammirati & Norvell 1995
Chrysomphalina Clémençon 1982
= *Chrysobostrychodes* G. Kost 1985
Cora Fr. 1825
= *Wainiocora* Tomas. 1950
Corella Vain. 1890
Cuphophyllus (Donk) Bon 1985
= *Dermolomopsis* Vizzini 2012
Cyphellostereum D.A. Reid 1965
Dictyonema C. Agardh ex Kunth 1822
= *Coraemyces* Cif. & Tomas. 1954
= *Dichonema* Blume & T. Nees 1826
= *Dictyonematomyces* Cif. & Tomas. 1954
= *Gyrolophium* Kunze ex Krombh. 1831
= *Laudatea* Johow 1884
= *Rhipidonematomyces* Cif. & Tomas. 1954
= *Rhizonema* Thwaites 1849
Eonema Redhead, Lücking & Lawrey 2009
Gliophorus Herink 1958
Haasiella Kotl. & Pouzar 1966
Humidicutis (Singer) Singer 1959
Hygroaster Singer 1955
Hygrocybe (Fr.) P. Kumm. 1871
= *Bertrandia* R. Heim 1936
= *Bertrandia* R. Heim 1966
= *Godfrinia* Maire 1902
= *Hydrophorus* Battarra ex Earle 1909
= *Pseudohygrocybe* (Bon) Kovalenko 1988
Hygrophorus Fr. 1836
= *Camarophyllus* (Fr.) P. Kumm. 1871
= *Limacium* (Fr. ex Rabenh.) P. Kumm. 1871
Lichenomphalia Redhead, Lutzoni, Moncalvo & Vilgalys 2002
= *Botrydiopsis* Trevis. 1845
= *Coriscium* Vain. 1890

= *Phalomia* Nieuwl. 1916
= *Phytoconis* Bory 1797
Neohygrocybe Herink 1958
Porpolomopsis Bresinsky 2008
Pseudoarmillariella Singer 1956
Semiomphalina Redhead 1984
Sinohygrocybe C.Q. Wang, Ming Zhang & T.H. Li 2018

Family Hymenogastraceae Vittad. 1831
Anamika K.A. Thomas, Peintner, M.M. Moser & Manim. 2002
Flammula (Fr.) P. Kumm. 1871
Galerina Earle 1909
= *Galerula* P. Karst. 1879
= *Pseudogalera* Velen. 1947
= *Phaeogalera* Kühner 1973
= *Pholidotopsis* Earle 1909
Gymnopilus P. Karst. 1879
Hebeloma (Fr.) P. Kumm. 1871
= *Hebelomatis* Earle 1909
= *Hebelomina* Maire 1935
= *Myxocybe* Fayod 1889
= *Picromyces* Battarra ex Earle 1909
Hymenogaster Vittad. 1831
= *Dendrogaster* Bucholtz 1901
= *Fechtneria* Velen. 1939
= *Hysterogaster* C.W. Dodge 1928
= *Radiogaster* Lloyd 1924
= *Rhizopogoniella* Soehner 1953
= *Roumeguerites* P. Karst. 1879
= *Sarcoloma* Locq. 1979
Naucoria (Fr.) P. Kumm. 1871
= *Alnicola* Kühner 1926
Phaeocollybia R. Heim 1931
= *Quercella* Velen. 1921
Psathyloma Soop, J.A. Cooper & Dima 2016
Psilocybe (Fr.) P. Kumm. 1871
= *Delitescor* Earle 1909
= *Naematoloma* P. Karst. 1879
= *Stropholoma* (Singer) Balletto 1989
= *Weraroa* Singer 1958

Family Inocybaceae Jülich 1982
Auritella Matheny & Bougher 2006
Inocybe (Fr.) Fr. 1863
= *Agmocybe* Earle 1909
= *Astrosporina* J. Schröt. 1889
= *Astrosporina* S. Imai 1938
= *Clypeus* (Britzelm.) Fayod 1889
= *Inocibium* Earle 1909
= *Inocybella* Zerova 1974
Tubariomyces Esteve-Rav. & Matheny 2010

Family Limnoperdaceae G.A. Escobar 1976
Limnoperdon G.A. Escobar 1976

Family Lycoperdaceae Chevall. 1826
Apioperdon (Kreisel & D. Krüger) Vizzini 2017
= *Lycoperdon* subgenus *Apioperdon* (Kreisel & D. Krüger) Jeppson & E. Larss. 2008
Bovista Pers. 1794
= *Globaria* Quél. 1873
= *Piesmycus* Raf. 1808
= *Pseudolycoperdon* Velen. 1947
= *Sackea* Rostk. 1844
Bryoperdon Vizzini 2017
Calbovista Morse ex M.T. Seidl 1995
= *Calbovista* Morse 1935
Calvatia Fr. 1849
= *Bovistaria* (Fr.) P. Karst. 1889
= *Eriosphaera* Reichardt 1866
= *Hypoblema* Lloyd 1902
= *Langermannia* Rostk. 1839
Gastropila Homrich & J.E. Wright 1973
= *Pila* Speg. 1923
Lycoperdon Pers. 1794
= *Bovistella* Morgan 1892
= *Calvatiella* C.H. Chow 1936
= *Capillaria* Velen. 1947
= *Cerophora* Raf. 1814
= *Handkea* Kreisel 1989
= *Priapus* Raf. 1808
= *Sufa* Adans. 1763
= *Utraria* Quél. 1873
= *Vascellum* F. Šmarda 1958
Morganella Zeller 1948

Family Lyophyllaceae Jülich 1982
Asterophora Ditmar 1809
= *Asterophora* Corda 1840
= *Asterophora* Fr. 1849
= *Asterotrichum* Bonord. 1851
Blastosporella T.J. Baroni & Franco-Mol. 2007
Calocybe Kühner ex Donk 1962
= *Calocybe* Kühner 1938
Calocybella Vizzini, Consiglio & Setti 2015
Clitolyophyllum Sesli, Vizzini & Contu 2016
Gerhardtia Bon 1994
Hypsizygus Singer 1947
Lyophyllopsis Sathe & J.T. Daniel 1981
Lyophyllum P. Karst. 1881
= *Caesposus* Nüesch 1937
Myochromella V. Hofst., Clémençon, Moncalvo & Redhead 2015
Ossicaulis Redhead & Ginns 1985
Rugosomyces Raithelh. 1979

Sagaranella V. Hofst., Clémençon, Moncalvo & Redhead 2014
Sphagnurus Redhead & V. Hofst. 2014
= *Bryophyllum* Vizzini 2014
Tephrocybe Donk 1962
Tephrocybella Picillo, Vizzini & Contu 2015
Termitomyces R. Heim 1942
= *Podabrella* Singer 1945
= *Rajapa* Singer 1945
= *Sinotermitomyces* M. Zang 1981
Tricholomella Zerova ex Kalamees 1992
= *Echinosporella* Contu 1992

Family Macrocystidiaceae Kühner 1980
Macrocystidia Joss. 1934
= *Galeromycena* Velen. 1947

Family Marasmiaceae Roze ex Kühner 1980
Amyloflagellula Singer 1966
Brunneocorticium Sheng H. Wu 2007
Campanella Henn. 1895
Chaetocalathus Singer 1943
Crinipellis Pat. 1889
Hymenogloea Pat. 1900
Marasmius Fr. 1836
= *Androsaceus* (Pers.) Pat. 1887
= *Chamaeceras* Rebent. ex Kuntze 1898
= *Discocyphella* Henn. 1900
= *Heliomyces* Lév. 1844
= *Hymenoconidium* Zukal 1888
= *Polymarasmius* Murrill 1915
= *Protomarasmius* Overeem 1927
= *Scorteus* Earle 1909
= *Tephrophana* Earle 1909
Moniliophthora H.C. Evans, Stalpers, Samson & Benny 1978
Neocampanella Nakasone, Hibbett & Goranova 2009
Tetrapyrgos E. Horak 1987
= *Pterospora* Métrod 1949

Family Mycenaceae Overeem 1926
Atheniella Redhead, Moncalvo, Vilgalys, Desjardin & B.A. Perry 2012
Cruentomycena R.H. Petersen, Kovalenko & O.V. Morozova 2008
Decapitatus Redhead & Seifert 2000
Favolaschia (Pat.) Pat. 1892
= *Hologloea* Pat. 1900
= *Mycomedusa* R. Heim 1945
= *Mycomedusa* R. Heim 1966
= *Poroauricula* McGinty 1917
= *Porolaschia* Pat. 1897
= *Porolaschia* Pat. 1898
Flabellimycena Redhead 1984
Heimiomyces Singer 1942
Hemimycena Singer 1938
= *Perona* Pers. 1825
Hydropus Kühner ex Singer 1948
Mycena (Pers.) Roussel 1806
= *Bactroboletus* Clem. 1909
= *Basidopus* Earle 1909
= *Collopus* Earle 1909
= *Corrugaria* Métrod 1949
= *Dictyoploca* Mont. ex Pat. 1890
= *Eomycenella* G.F. Atk. 1902
= *Filoboletus* Henn. 1900
= *Galactopus* Earle 1909
= *Hiatula* (Fr.) Mont. 1854
= *Insiticia* Earle 1909
= *Leiopoda* Velen. 1947
= *Leptomyces* Mont. 1856
= *Linopodium* Earle 1909
= *Mycenoporella* Overeem 1926
= *Mycenopsis* Velen. 1947
= *Phlebomycena* R. Heim 1945
= *Phlebomycena* R. Heim 1966
= *Poromycena* Overeem 1926
= *Prunulus* Gray 1821
= *Pseudomycena* Cejp 1929
= *Stereopodium* Earle 1909
= *Zephirea* Velen. 1947
Mycopan Redhead, Moncalvo & Vilgalys 2013
Panellus P. Karst. 1879
= *Dictyopanus* Pat. 1900
= *Scytinotus* P. Karst. 1879
= *Urospora* Fayod 1889
= *Urosporellina* E. Horak 1968
Resinomycena Redhead & Singer 1981
Roridomyces Rexer 1994
= *Roridella* E. Horak 2005
Sarcomyxa P. Karst. 1891
Tectella Earle 1909
Xeromphalina Kühner & Maire 1934
= *Phlebomarasmius* R. Heim 1967
= *Valentinia* Velen. 1939

Mythicomycetaceae Vizzini, Consiglio & M. Marchetti 2019
Mythicomyces Redhead & A.H. Sm. 1986
Stagnicola Redhead & A.H. Sm. 1986

Family Niaceae Jülich 1982
Digitatispora Doguet 1962
Flagelloscypha Donk 1951
Halocyphina Kohlm. & E. Kohlm. 1965
Lachnella Fr. 1836
Maireina W.B. Cooke 1961
Merismodes Earle 1909
= *Cyphellopsis* Donk 1931
= *Phaeocyphellopsis* W.B. Cooke 1961

= *Pseudodasyscypha* Velen. 1939
Nia R.T. Moore & Meyers 1961
Peyronelina P.J. Fisher, J. Webster & D.F. Kane 1976
Woldmaria W.B. Cooke 1961

Family Omphalotaceae Bresinsky 1985
Anthracophyllum Ces. 1879
Caripia Kuntze 1898
Connopus R.H. Petersen 2010
Gymnopanella Sand.-Leiva, J.V. McDonald & Thorn 2016
Gymnopus (Pers.) Gray 1821
= *Setulipes* Antonín 1987
Hymenoporus Tkalčec, Mešić & Chun Y. Deng 2015
Lentinula Earle 1909
Marasmiellus Murrill 1915
= *Collybiopsis* (J. Schröt.) Earle 1909
Mycetinis Earle 1909
Neonothopanus R.H. Petersen & Krisai 1999
Omphalotus Fayod 1889
= *Lampteromyces* Singer 1947
= *Monodelphus* Earle 1909
Rhodocollybia Singer 1939
Paragymnopus J.S. Oliveira 2019
Pusillomyces J.S. Oliveira 2019

Family Physalacriaceae Corner 1970
Anastrophella E. Horak & Desjardin 1994
Armillaria (Fr.) Staude 1857
= *Armillariella* (P. Karst.) P. Karst. 1881
= *Aphotistus* Humb. 1793
= *Polymyces* Battarra ex Earle 1909
= *Rhizomorpha* Roth 1791
Cibaomyces Zhu L. Yang, Y.J. Hao & J. Qin 2014
Cribbea A.H. Sm. & D.A. Reid 1962
Cryptomarasmius T.S. Jenkinson & Desjardin 2014
Cylindrobasidium Jülich 1974
Cyptotrama Singer 1960
= *Xerulina* Singer 1962
Dactylosporina (Clémençon) Dörfelt 1985
Desarmillaria (Herink) R. A. Koch & Aime 2017
Epicnaphus Singer 1960
Flammulina P. Karst. 1891
= *Collybidium* Earle 1909
= *Myxocollybia* Singer 1936
Gloiocephala Massee 1892
Guyanagaster T.W. Henkel, M.E. Sm. & Aime 2010
Hymenopellis R.H. Petersen 2010
Laccariopsis Vizzini 2013
Manuripia Singer 1960
Mucidula Pat. 1887
Mycaureola Maire & Chemin 1922
Naiadolina Redhead, Labbé & Ginns 2013
Oudemansiella Speg. 1881
= *Coprinopsis* Beeli 1929
= *Oudemansia* Speg. 1880
= *Phaeolimacium* Henn. 1899
Paraxerula R.H. Petersen 2010
Physalacria Peck 1882
= *Baumanniella* Henn. 1897
= *Eoagaricus* L. Krieg. 1923
= *Hormomitaria* Corner 1950
Ponticulomyces R.H. Petersen 2010
Protoxerula R.H. Petersen 2010
Rhizomarasmius R.H. Petersen 2000
Rhodotus Maire 1926
Strobilurus Singer 1962
Xerula Maire 1933

Family Pleurotaceae Kühner 1980
Agaricochaete Eichelb. 1906
Hohenbuehelia Schulzer 1866
= *Acanthocystis* (Fayod) Kühner 1926
= *Nematoctonus* Drechsler 1941
Lignomyces R.H. Petersen & Zmitr. 2015
Pleurotus (Fr.) P. Kumm. 1871
= *Antromycopsis* Pat. & Trab. 1897
= *Crepidopus* Nees ex Gray 1821
= *Lentodiopsis* Bubák 1895
= *Nothopanus* Singer 1944
= *Pterophyllus* Lév. 1844
= *Scleroma* Fr. 1838
= *Velolentinus* Overeem 1927
Resupinatus Nees ex Gray 1821
= *Asterotus* Singer 1943
= *Phyllotremella* Lloyd 1920
= *Phyllotus* P. Karst. 1879
= *Pleurotopsis* (Henn.) Earle 1909
= *Rhodocyphella* W.B. Cooke 1961
= *Scytinotopsis* Singer 1943
= *Stigmatolemma* Kalchbr. 1882
= *Urceolus* Velen. 1939

Family Pluteaceae Kotl. & Pouzar 1972
Pluteus Fr. 1836
= *Annularia* (Schulzer) Gillet 1876
= *Chamaeota* (W.G. Sm.) Earle 1909
= *Hyporrhodius* (Fr.) Staude 1857
= *Rhodosporus* J. Schröt. 1889
Volvariella Speg. 1898
= *Volva* Adans. 1763
= *Volvaria* (Fr.) P. Kumm. 1871
= *Volvariopsis* Murrill 1911
= *Volvarius* Roussel 1806

Volvopluteus Vizzini, Contu & Justo 2011
= *Pseudofarinaceus* Earle 1909

Family Porotheleaceae Murrill 1916
Phloeomana Redhead 2013
Porotheleum Fr. 1818
= *Stromatoscypha* Donk 1951

Family Psathyrellaceae Vilgalys, Moncalvo & Redhead 2001
Coprinellus P. Karst. 1879
= *Annularius* Roussel 1806
= *Ephemerocybe* Fayod 1889
= *Pseudocoprinus* Kühner 1928
Coprinopsis P. Karst. 1881
= *Pselliophora* P. Karst. 1879
Cystoagaricus Singer 1947
Gasteroagaricoides D.A. Reid 1986
Homophron (Britzelm.) Örstadius & E. Larss. 2015
Hormographiella Guarro & Gené 1992
Kauffmania Örstadius & E. Larss. 2015
Lacrymaria Pat. 1887
= *Cortiniopsis* J. Schröt. 1889
= *Glyptospora* Fayod 1889
Macrometrula Donk & Singer 1948
Parasola Redhead, Vilgalys & Hopple 2001
Psathyrella (Fr.) Quél. 1872
= *Astylospora* Fayod 1889
= *Drosophila* Quél. 1886
= *Gymnochilus* Clem. 1896
= *Hypholomopsis* Earle 1909
= *Pannucia* P. Karst. 1879
= *Pluteopsis* Fayod 1889
= *Psalliotina* Velen. 1939
= *Psathyra* (Fr.) P. Kumm. 1871
= *Psilocybe* Fayod 1889
Rhacophyllus Berk. & Broome 1871
Typhrasa Örstadius & E. Larss. 2015

Family Pseudoclitocybaceae Vizzini, Consiglio, P.-A. Moreau & P. Alvarado 2018
Bonomyces Vizzini 2014
Cleistocybe Ammirati, A.D. Parker & Matheny 2007
Clitopaxillus G. Moreno, Vizzini, Consiglio & P. Alvarado 2018
Harmajaea Dima, P. Alvarado & Kekki 2018
Musumecia Vizzini & Contu 2011
Pogonoloma (Singer) Sánchez-García 2014
Pseudoclitocybe (Singer) Singer 1956

Family Pterulaceae Corner 1970
Actiniceps Berk. & Broome 1876
= *Dimorphocystis* Corner 1950
= *Wiesnerina* Höhn. 1907
Allantula Corner 1952
Aphanobasidium Jülich 1979
Chaetotyphula Corner 1950
Coronicium J. Erikss. & Ryvarden 1975
Deflexula Corner 1950
Lepidomyces Jülich 1979
Merulicium J. Erikss. & Ryvarden 1976
Parapterulicium Corner 1952
Pterula Fr. 1825
= *Phaeopterula* (Henn.) Sacc. & D. Sacc. 1905
Pterulicium Corner 1950
Radulomyces M.P. Christ. 1960
= *Adustomyces* Jülich 1979
= *Cerocorticium* Henn. 1900
= *Chrysoderma* Boidin & Gilles 1991
= *Flavophlebia* (Parmasto) K.H. Larss. & Hjortstam 1977
Radulotubus Y.C. Dai, S.H. He & C.L. Zhao 2016

Family Schizophyllaceae Quél. 1888
Auriculariopsis Maire 1902
Porodisculus Murrill 1907
= *Enslinia* Fr. 1836
= *Porodiscus* Murrill 1903
Schizophyllum Fr. 1815
= *Apus* Gray 1821
= *Hyponevris* Earle 1909
= *Petrona* Adans. 1763
= *Phaeoschizophyllum* W.B. Cooke 1962
= *Rhipidium* Wallr. 1833
= *Scaphophoeum* Ehrenb. ex Wallr. 1833
= *Scaphophorum* Ehrenb. 1820
= *Schizonia* Pers. 1828

Family Stephanosporaceae Oberw. & E. Horak 1979
Athelidium Oberw. 1965
Cristinia Parmasto 1968
= *Dacryobasidium* Jülich 1982
Lindtneria Pilát 1938
Mayamontana Castellano, Trappe & Lodge 2007
Stephanospora Pat. 1914

Family Strophariaceae Singer & A.H. Sm. 1946
Agrocybe Fayod 1889
= *Bulla* Battarra ex Earle 1909
= *Bulla* Battarra 1755
= *Cyclopus* (Quél.) Barbier 1907
= *Togaria* W.G. Sm. 1908
Bogbodia Redhead 2013
Brauniella Rick ex Singer 1955
= *Braunia* Rick 1934
Deconica (W.G. Sm.) P. Karst. 1879
Hypholoma (Fr.) P. Kumm. 1871
Leratiomyces Bresinsky & Manfr. Binder ex Bridge, Spooner, Beever & D.C. Park 2008

= *Cytophyllopsis* R. Heim 1958
Melanotus Pat. 1900
Pholiota (Fr.) P. Kumm. 1871
= *Derminus* (Fr.) Staude 1857
= *Dryophila* Quél. 1886
= *Flammopsis* Fayod 1889
= *Gymnocybe* P. Karst. 1879
= *Hemipholiota* (Singer) Romagn. 1980
= *Hemipholiota* (Singer) Bon 1986
= *Hypodendrum* Paulet ex Earle 1909
= *Kuehneromyces* Singer & A.H. Sm. 1948
= *Nemecomyces* Pilát 1933
= *Nivatogastrium* Singer & A.H. Sm. 1959
= *Phaeonematoloma* (Singer) Bon 1994
= *Ryssospora* Fayod 1889
= *Visculus* Earle 1909
Protostropharia Redhead, Moncalvo & Vilgalys 2013
Pseudogymnopilus Raithelh. 1974
Stropharia (Fr.) Quél. 1872

Family Tricholomataceae R. Heim ex Pouzar 1983
Albomagister Sánchez-García, Birkebak & Matheny 2014
Corneriella Sánchez-García 2014
Dennisiomyces Singer 1955
Dermoloma J.E. Lange ex Herink 1958
= *Dermoloma* J.E. Lange ex Singer 1951
= *Dermoloma* J.E. Lange ex Singer 1955
Leucopaxillus Boursier 1925
Porpoloma Singer 1952
Pseudobaeospora Singer 1942
Pseudoporpoloma Vizzini & Consiglio 2016
Pseudotricholoma (Singer) Sánchez-García & Matheny 2014
Tricholoma (Fr.) Staude 1857
= *Cortinellus* Roze 1876
= *Glutinaster* Earle 1909
= *Gyrophila* Quél. 1886
= *Mastoleucomyces* Battarra ex Kuntze 1891
= *Megatricholoma* G. Kost. 1984
= *Monomyces* Battarra ex Earle 1909
= *Phlebophora* Lév. 1841
= *Sphaerocephalus* Battarra ex Earle 1909

Family Tubariaceae Vizzini 2008
Cyclocybe Velen. 1939
Flammulaster Earle 1909
Hemistropharia Jacobsson & E. Larss. 2007
Pachylepyrium Singer 1958
Phaeomarasmius Scherff. 1897
= *Epicorticium* Velen. 1926
= *Flocculina* P.D. Orton 1960
= *Marasmiopsis* Henn. 1898
Pleuromyces Dima, P.-A. Moreau & V. Papp 2018
Tubaria (W.G. Sm.) Gillet 1876

Family Typhulaceae Jülich 1982
Lutypha Khurana, K.S. Thind & Berthier 1977
Macrotyphula R.H. Petersen 1972
Tygervalleyomyces Crous 2017
Typhula (Pers.) Fr. 1818
= *Cnazonaria* Corda 1829
= *Dacryopsella* Höhn. 1915
= *Gliocoryne* Maire 1909
= *Phacorhiza* Pers. 1822
= *Pistillaria* Fr. 1821
= *Pistillina* Quél. 1881
= *Scleromitra* Corda 1829
= *Sphaerula* Pat. 1883

Agaricales genera *incertae sedis*
Acanthocorticium Baltazar, Gorjón & Rajchenb. 2015
Acinophora Raf. 1808
Aleurocystis Lloyd ex G. Cunn. 1956
Amparoina Singer 1958
Amylolepiota Harmaja 2002
Aphyllotus Singer 1973
Arthromyces T.J. Baroni & Lodge 2007
Arthrosporella Singer 1970
= *Nothoclavulina* Singer 1970
Asproinocybe R. Heim 1970
Aspropaxillus Kühner & Maire 1934
Atractosporocybe P. Alvarado, G. Moreno & Vizzini 2015
Austroclitocybe Raithelh. 1972
Austroomphaliaster Garrido 1988
Baeospora Singer 1938
Callistodermatium Singer 1981
Calyptella Quél. 1886
Caulorhiza Lennox 1979
Cellypha Donk 1959
Cephaloscypha Agerer 1975
Cercopemyces T.J. Baroni, Kropp & V.S. Evenson 2014
Clavomphalia E. Horak 1987
Clitocybe (Fr.) Staude 1857
= *Pseudolyophyllum* Raithelh. 1977
= *Rubeolarius* Raithelh. 1981
= *Singerella* Harmaja 1974
= *Trigonipes* Velen. 1939
Clitocybula (Singer) Singer ex Métrod 1952
Coccobotrys Boud. & Pat. 1900
Collybia (Fr.) Staude 1857
= *Microcollybia* Métrod 1952
= *Microcollybia* Lennox 1979
Conchomyces Overeem 1927
Crucibulum Tul. & C. Tul. 1844
Cyathus Haller 1768

= *Cyathia* P. Browne 1756
= *Cyathodes* P. Micheli ex Kuntze 1891
= *Peziza* L. 1753
Cymatella Pat. 1899
Cymatellopsis Parmasto 1985
Cynema Maas Geest. & E. Horak 1995
Cyphellocalathus Agerer 1981
Cystoderma Fayod 1889
Cystodermella Harmaja 2002
Deigloria Agerer 1980
Delicatula Fayod 1889
= *Retocybe* Velen. 1947
Dendrocollybia R.H. Petersen & Redhead 2001
= *Sclerostilbum* Povah 1932
= *Tilachlidiopsis* Keissl. 1924
Dendrothele Höhn. & Litsch. 1907
= *Aleurocorticium* P.A. Lemke 1964
Disporotrichum Stalpers 1984
Fayodia Kühner 1930
Fibulochlamys A.I. Romero & Cabral 1989
Fistulina Bull. 1791
= *Agarico-carnis* Paulet 1793
= *Buglossus* Wahlenb. 1820
= *Hypodrys* Pers. 1825
Fissolimbus E. Horak 1979
Floccularia Pouzar 1957
Gamundia Raithelh. 1979
= *Stachyomphalina* H.E. Bigelow 1979
Gerronema Singer 1951
Giacomia Vizzini & Contu 2012
Glabrocyphella W.B. Cooke 1961
Gloioxanthomyces Lodge, Vizzini, Ercole & Boertm. 2013
Gramincola Velen. 1947
Henningsomyces Kuntze 1898
= *Solenia* Pers. 1794
Hispidocalyptella E. Horak & Desjardin 1994
Hygrophorocybe Vizzini & Contu 2014
Infundibulicybe Harmaja 2003
Lactocollybia Singer 1939
= *Bertrandiella* R. Heim 1959
= *Bertrandiella* R. Heim 1966
Lecanocybe Desjardin & E. Horak 1999
Lepista (Fr.) W.G. Sm. 1870
= *Rhodopaxillus* Maire 1913
Lepistella T.J. Baroni & Ovrebo 2007
Leucocalocybe X.D. Yu & Y.J. Yao 2011
Leucocortinarius (J.E. Lange) Singer 1945
Leucocybe Vizzini, P. Alvarado, G. Moreno & Consiglio 2015
Leucoinocybe Singer ex Antonín, Borovička, Holec & Kolařík 2019
Leucopholiota (Romagn.) O.K. Mill., T.J. Volk & Bessette 1996
Lignomphalia Antonín, Borovička, Holec & Kolařík 2019
Lulesia Singer 1970
Lycogalopsis E. Fisch. 1886
= *Enteromyxa* Ces. 1879
Megacollybia Kotl. & Pouzar 1972
Melanoleuca Pat. 1897
= *Kinia* Consiglio, Contu, Setti & Vizzini 2008
= *Psammospora* Fayod 1893
Melanomphalia M.P. Christ. 1936
= *Horakomyces* Raithelh. 1983
Meottomyces Vizzini 2008
Mesophelliopsis Bat. & A.F. Vital 1957
Metraria (Cooke) Cooke & Massee 1891
Metulocyphella Agerer 1983
Mucronella Fr. 1874
= *Myxomycidium* Massee 1901
Mycenella (J.E. Lange) Singer 1938
Mycoalvimia Singer 1981
Mycocalia J.T. Palmer 1961
Mycospongia Velen. 1939
Myxomphalia Hora 1960
Neoclitocybe Singer 1962
Neopaxillus Singer 1948
Nidula V.S. White 1902
Nidularia Fr. 1817
= *Granularia* Roth 1791
Nochascypha Agerer 1983
Notholepista Vizzini & Contu 2012
Omphaliaster Lamoure 1971
Omphalina Quél. 1886
= *Phaeotellus* Kühner & Lamoure 1972
Palaeocephala Singer 1962
Panaeolina Maire 1933
Panaeolus (Fr.) Quél. 1872
= *Anellaria* P. Karst. 1879
= *Campanularius* Roussel 1806
= *Chalymmota* P. Karst. 1879
= *Copelandia* Bres. 1912
= *Coprinarius* (Fr.) P. Kumm. 1871
Paralepistopsis Vizzini 2012
Peglerochaete Sarwal & Locq. 1983
Pegleromyces Singer 1981
Phaeodepas D.A. Reid 1961
Phaeolepiota Maire ex Konrad & Maubl. 1928
Phaeomycena R. Heim ex Singer & Digilio 1952
Phaeopholiota Locq. & Sarwal 1983
Phlebonema R. Heim 1929
Phlebophyllum R. Heim 1969
Phyllotopsis E.-J. Gilbert & Donk ex Singer 1936
= *Tilotus* Kalchbr. 1881

= *Tomentifolium* Murrill 1903
Physocystidium Singer 1962
Pleurella E. Horak 1971
Pleurocybella Singer 1947
Plicatura Peck 1872
Polygaster Fr. 1823
Pseudoclitopilus Vizzini & Contu 2012
Pseudofistulina O. Fidalgo & M. Fidalgo 1963
Pseudohiatula (Singer) Singer 1938
Pseudohygrophorus Velen. 1939
Pseudolasiobolus Agerer 1983
Pseudoomphalina (Singer) Singer 1956
= *Neohygrophorus* Singer 1962
Pseudotyphula Corner 1953
Radulomycetopsis Dhingra, Priyanka & J. Kaur 2012
Rectipilus Agerer 1973
Rhizocybe Vizzini, G. Moreno, P. Alvarado & Consiglio 2015
Rimbachia Pat. 1891
= *Mniopetalum* Donk & Singer 1962
= *Pleuromycenula* Singer 1973
Ripartitella Singer 1947
Ripartites P. Karst. 1879
Secotium Kunze 1840
Singerocybe Harmaja 1988
Skepperiella Pilát 1927
Squamanita Imbach 1946
= *Coolia* Huijsman 1943
= *Dissoderma* (A.H. Sm. & Singer) Singer 1973
Stanglomyces Raithelh. 1986
Stemastrum Raf. 1808
Stromatocyphella W.B. Cooke 1961
Tephroderma Contu & Musumeci 2014
Trichocybe Vizzini 2010
Tricholomopsis Singer 1939
Tricholosporum Guzmán 1975
Trogia Fr. 1836
Ugola Adans. 1763
Vanromburghia Holterm. 1898
Verrucospora E. Horak 1967

Order Amylocorticiales K.H. Larss., Manfr. Binder & Hibbett 2010

Family Amylocorticiaceae Jülich 1982
Amyloathelia Hjortstam & Ryvarden 1979
Amylocorticiellum Spirin & Zmitr. 2002
Amylocorticium Pouzar 1959
Amyloxenasma (Oberw.) Hjortstam & Ryvarden 2005
Anomoloma Niemelä & K.H. Larss. 2007
Anomoporia Pouzar 1966
Ceraceomyces Jülich 1972
Irpicodon Pouzar 1966
Plicaturopsis D.A. Reid 1964
Podoserpula D.A. Reid 1963
Serpulomyces (Zmitr.) Zmitr. 2002

Order Atheliales Jülich 1981

Family Atheliaceae Jülich 1982
Amphinema P. Karst. 1892
= *Diplonema* P. Karst. 1889
Athelia Pers. 1822
= *Fibularhizoctonia* G.C. Adams & Kropp 1996
Athelicium K.H. Larss. & Hjortstam 1986
Athelocystis Hjortstam & Ryvarden 2010
Athelopsis Oberw. ex Parmasto 1968
Butlerelfia Weresub & Illman 1980
Byssocorticium Bondartsev & Singer 1944
= *Byssocorticium* Bondartsev & Singer 1941
= *Caerulicium* Jülich 1982
Elaphocephala Pouzar 1983
Hypochnella J. Schröt. 1888
Hypochniciellum Hjortstam & Ryvarden 1980
Leptosporomyces Jülich 1972
= *Fibulomyces* Jülich 1972
Lobulicium K.H. Larss. & Hjortstam 1982
Lyoathelia Hjortstam & Ryvarden 2004
Melzericium Hauerslev 1975
Mycostigma Jülich 1976
Piloderma Jülich 1969
Pteridomyces Jülich 1979
Taeniospora Marvanová 1977
Tretomyces K.H. Larss., Kotir. & Saaren. 2011
Tylospora Donk 1960
= *Tylosperma* Donk 1957

Order Auriculariales J. Schröt. 1887

Family Auriculariaceae Fr. 1838
Amphistereum Spirin & Malysheva 2017
Auricularia Bull. 1780
= *Auricula* Battarra 1755
= *Auricula* Battarra ex Kuntze 1891
= *Auriculariella* (Sacc.) Clem. 1909
= *Conchites* Paulet 1793
= *Oncomyces* Klotzsch 1843
= *Patila* Adans. 1763
= *Seismosarca* Cooke 1889
Eichleriella Bres. 1903
Elmerina Bres. 1912
Exidia Fr. 1822
= *Spicularia* Chevall. 1826
= *Tremellochaete* Raitv. 1964
= *Ulocolla* Bref. 1888
Exidiopsis (Bref.) Möller 1895
Fibulosebacea K. Wells & Raitv. 1987
Heterochaete Pat. 1892
Heteroradulum Lloyd ex Spirin & Malysheva 2017

Protodaedalea Imazeki 1955
Pseudostypella McNabb 1969
Sclerotrema Spirin & Malysheva 2017
Family Hyaloriaceae Lindau 1897
Helicomyxa R. Kirschner & Chee J. Chen 2004
Hyaloria Möller 1895
Myxarium Wallr. 1833
Auriculariales genera *incertae sedis*
Basidiodendron Rick 1938
Bourdotia (Bres.) Bres. & Torrend 1913
Ceratosebacina P. Roberts 1993
Dendrogloeon Spirin & Miettinen 2015
Ductifera Lloyd 1917
= *Gloeotromera* Ervin 1956
Endoperplexa P. Roberts 1993
Gelacantha V. Malysheva & Spirin 2019
Grammatus H.S. Yuan & C. Decock 2018
Guepinia Fr. 1825
Hauerslevia P. Roberts 1998
Heterorepetobasidium Chee J. Chen & Oberw. 2002
Heteroscypha Oberw. & Agerer 1979
Hyalodon V. Malysheva & Spirin 2018
Hydrophana V. Malysheva & Spirin 2019
Metabourdotia L.S. Olive 1957
Microsebacina P. Roberts 1993
Mycostilla Spirin & V. Malysheva 2018
Myxariellum Spirin & V. Malysheva 2019
Ofella Spirin & V. Malysheva 2019
Porpopycnis R. Kirschner 2012
Protoacia Spirin & V. Malysheva 2019
Protodontia Höhn. 1907
Protograndinia Rick 1933
Protohydnum Möller 1895
Protomerulius Möller 1895
= *Aporpium* Bondartsev & Singer 1941
= *Aporpium* Bondartsev & Singer 1944
Protoradulum Rick 1933
Pseudohydnum P. Karst. 1868
= *Hydnogloea* Curr., Berk. & Broome 1871
Renatobasidium Hauerslev 1993
Stypella Möller 1895
= *Gloeosebacina* Neuhoff 1924
= *Heterochaetella* (Bourdot) Bourdot & Galzin 1928
Stypellopsis Spirin & V. Malysheva 2018
Tremellacantha Jülich 1980
Order Boletales E.-J. Gilbert 1931
Family Boletaceae Chevall. 1826
Afroboletus Pegler & T.W.K. Young 1981
Afrocastellanoa M.E. Sm. & Orihara 2017
Alessioporus Gelardi, Vizzini & Simonini 2014
Aureoboletus Pouzar 1957
Australopilus Halling & N.A. Fechner 2012
Austroboletus (Corner) Wolfe 1980
Baorangia G. Wu & Zhu L. Yang 2015
Binderoboletus T.W. Henkel & M.E. Sm. 2016
Boletellus Murrill 1909
= *Boletogaster* Lohwag 1926
= *Strobilofungus* McGinty 1915
Boletochaete Singer 1944
Boletus L. 1753
= *Ceriomyces* Murrill 1909
= *Dictyopus* Quél. 1886
= *Tubiporus* P. Karst. 1881
= *Xerocomopsis* Reichert 1940
Borofutus Hosen & Zhu L. Yang 2012
Bothia Halling, T.J. Baroni & Manfr. Binder 2007
Buchwaldoboletus Pilát 1969
Butyriboletus Arora & J.L. Frank 2014
Caloboletus Vizzini 2014
Carolinigaster M.E. Sm. & S. Cruz 2018
Castellanea T.W. Henkel & M.E. Sm. 2015
Chalciporus Bataille 1908
Chamonixia Rolland 1899
Chiua Y.C. Li & Zhu L. Yang 2016
Corneroboletus N.K. Zeng & Zhu L. Yang 2012
Costatisporus T.W. Henkel & M.E. Sm. 2015
Crocinoboletus N.K. Zeng, Zhu L. Yang & G. Wu 2014
Cupreoboletus Simonini, Gelardi & Vizzini 2015
Cyanoboletus Gelardi, Vizzini & Simonini 2014
Durianella Desjardin, A.W. Wilson & Manfr. Binder 2008
Erythrophylloporus Ming Zhang & T.H. Li 2018
Fistulinella Henn. 1901
= *Gastrotylopilus* T.H. Li & Watling 1999
= *Ixechinus* R. Heim 1968
Gastroboletus Lohwag 1926
Gastroleccinum Thiers 1989
Guyanaporus T.W. Henkel & M.E. Sm. 2016
Gymnogaster J.W. Cribb 1956
Harrya Halling, Nuhn & Osmundson 2012
Heimioporus E. Horak 2004
Heliogaster Orihara & K. Iwase 2010
Hemileccinum Šutara 2008
Hortiboletus Simonini, Vizzini & Gelardi 2015
Hourangia Xue T. Zhu & Zhu L. Yang 2015

Hymenoboletus Y.C. Li & Zhu L. Yang 2016
Imleria Vizzini 2014
Imperator G. Koller, Assyov, Bellanger, Bertéa, Loizides, G. Marques, P.-A. Moreau, J.A. Muñoz, Oppicelli, Puddu & F. Richard 2015
Indoporus A. Parihar, K. Das, Hembrom & Vizzini 2018
Ionosporus O. Khmelnitsky 2019
Jimtrappea T.W. Henkel, M.E. Sm. & Aime 2015
Kombocles Castellano, T.W. Henkel & Dentinger 2016
Lanmaoa G. Wu & Zhu L. Yang 2015
Leccinellum Bresinsky & Manfr. Binder 2003
Leccinum Gray 1821
= *Krombholziella* Maire 1937
= *Trachypus* Bataille 1908
Mackintoshia Pacioni & Sharp 2000
Mucilopilus Wolfe 1979
Mycoamaranthus Castellano, Trappe & Malajczuk 1992
Neoboletus Gelardi, Simonini & Vizzini 2014
Nigroboletus Gelardi, Vizzini, E. Horak, T.H. Li & Ming Zhang 2015
Octaviania Vittad. 1831
= *Maccagnea* Zeller & C.W. Dodge 1928
Parvixerocomus G. Wu & Zhu L. Yang 2015
Paxillogaster E. Horak 1966
Phylloboletellus Singer 1952
Phyllobolites Singer 1942
Phylloporus Quél. 1888
Porphyrellus E.-J. Gilbert 1931
Pseudoaustroboletus Y.C. Li & Zhu L. Yang 2014
Pseudoboletus Šutara 1991
Pulchroboletus Gelardi, Vizzini & Simonini 2014
Pulveroboletus Murrill 1909
Retiboletus Manfr. Binder & Bresinsky 2002
Rheubarbariboletus Vizzini, Simonini & Gelardi 2015
Rhodactina Pegler & T.W.K. Young 1989
Rossbeevera T. Lebel, Orihara & N. Maek. 2012
Royoungia Castellano, Trappe & Malajczuk 1992
Rubroboletus Kuan Zhao & Zhu L. Yang 2014
Rugiboletus G. Wu & Zhu L. Yang 2015
Setogyroporus Heinem. & Rammeloo 1982
Singerocomus T.W. Henkel & M.E. Sm. 2016
Singeromyces M.M. Moser 1966
Solioccasus Trappe, Osmundson, Manfr. Binder, Castellano & Halling 2013
Spongiforma Desjardin, Manfr. Binder, Roekring & Flegel 2009
Spongispora G. Wu, S.M.L. Lee, E. Horak & Zhu L. Yang 2018
Strobilomyces Berk. 1851
= *Eriocorys* Quél. 1886
Suillellus Murrill 1909
Sutorius Halling, Nuhn & N.A. Fechner 2012
Tengioboletus G. Wu & Zhu L. Yang 2016
Tubosaeta E. Horak 1967
Turmalinea Orihara & N. Maek. 2015
Tylocinum Y.C. Li & Zhu L. Yang 2016
Tylopilus P. Karst. 1881
= *Leucogyroporus* Snell 1942
= *Phaeoporus* Bataille 1908
= *Rhodobolites* Beck 1923
= *Rhodoporus* Quél. ex Bataille 1908
Veloporphyrellus L.D. Gómez & Singer 1984
Wakefieldia Corner & Hawker 1953
Xanthoconium Singer 1944
Xerocomellus Šutara 2008
Xerocomus Quél. 1887
= *Versipellis* Quél. 1886
Zangia Y.C. Li & Zhu L. Yang 2011

Family Boletinellaceae P.M. Kirk, P.F. Cannon & J.C. David 2001
Boletinellus Murrill 1909
Phlebopus (R. Heim) Singer 1936
= *Phaeogyroporus* Singer 1944

Family Calostomataceae E. Fisch. 1900
Calostoma Desv. 1809
= *Gyropodium* E. Hitchc. 1825
= *Husseia* Berk. 1847
= *Mitremyces* Nees 1816

Family Coniophoraceae Ulbr. 1928
Chrysoconia McCabe & G.A. Escobar 1979
Coniophora DC. 1815
= *Coniophorella* P. Karst. 1889
Coniophoropsis Hjortstam & Ryvarden 1986
Gyrodontium Pat. 1900
= *Boninohydnum* S. Ito & S. Imai 1940
Sedecula Zeller 1941

Family Diplocystidiaceae Kreisel 1974
Astraeus Morgan 1889
= *Diploderma* Link 1816
Diplocystis Berk. & M.A. Curtis 1868
Endogonopsis R. Heim 1966
Tremellogaster E. Fisch. 1924

Family Gasterellaceae Zeller 1948
Gasterella Zeller & L.B. Walker 1935

Family Gomphidiaceae Maire ex Jülich 1982
Chroogomphus (Singer) O.K. Mill. 1964
= *Brauniellula* A.H. Sm. & Singer 1959
Cystogomphus Singer 1942
Gomphidius Fr. 1836
= *Leucogomphidius* Kotl. & Pouzar 1972
Gomphogaster O.K. Mill. 1973

Family Gyroporaceae (Singer) Manfr. Binder & Bresinsky 2002
Gyroporus Quél. 1886
= *Coelopus* Bataille 1908
= *Leucobolites* Beck 1923
= *Leucoconius* Beck 1923
Family Hygrophoropsidaceae Kühner 1980
Hygrophoropsis (J. Schröt.) Maire ex Martin-Sans 1929
Leucogyrophana Pouzar 1958
Family Paxillaceae Lotsy 1907
Alpova C.W. Dodge 1931
Austrogaster Singer 1962
Gyrodon Opat. 1836
= *Anastomaria* Raf. 1820
= *Campbellia* Cooke & Massee 1890
= *Gilbertina* R. Heim 1966
= *Pseudogyrodon* Heinem. & Rammeloo 1983
= *Rodwaya* Syd. & P. Syd. 1901
= *Uloporus* Quél. 1886
Hoehnelogaster Lohwag 1926
Hydnomerulius Jarosch & Besl 2001
Meiorganum R. Heim 1966
Melanogaster Corda 1831
= *Argylium* Wallr. 1833
= *Bulliardia* Jungh. 1830
Neoalpova Vizzini 2014
Paragyrodon (Singer) Singer 1942
Paxillus Fr. 1836
= *Paxillopsis* E.-J. Gilbert 1931
= *Rhymovis* Pers. ex Rabenh. 1844
= *Ruthea* Opat. 1836
Family Protogastraceae Zeller 1934
Protogaster Thaxt. 1934
Family Rhizopogonaceae Gäum. & C.W. Dodge 1928
Fevansia Trappe & Castellano 2000
Rhizopogon Fr. 1817
= *Anthracophlous* Mattir. ex Lloyd 1913
= *Hysteromyces* Vittad. 1844
= *Splanchnomyces* Corda 1831
= *Trappeindia* Castellano, S.L. Mill., L. Singh bis & T.N. Lakh. 2012
Rhopalogaster J.R. Johnst. 1902
Family Sclerodermataceae Corda 1842
Chlorogaster Læssøe & Jalink 2004
Favillea Fr. 1849
Horakiella Castellano & Trappe 1992
Pisolithus Alb. & Schwein. 1805
= *Durosaccum* Lloyd 1924
= *Endacinus* Raf. 1814
= *Lycoperdodes* Haller ex Kuntze 1891
= *Pisocarpium* Link 1808
= *Polypera* Pers. 1818
= *Polysaccum* F. Desp. & DC. 1807
Scleroderma Pers. 1801
= *Actigea* Raf. 1814
= *Actinodermium* Nees 1816
= *Caloderma* Petri 1900
= *Goupilia* Mérat 1834
= *Mycastrum* Raf. 1813
= *Neosaccardia* Mattir. 1921
= *Nepotatus* Lloyd 1925
= *Phlyctospora* Corda 1841
= *Pirogaster* Henn. 1901
= *Pompholyx* Corda 1834
= *Sclerangium* Lév. 1848
= *Stella* Massee 1889
= *Sterrebekia* Link 1816
= *Veligaster* Guzmán 1970
Family Serpulaceae Jarosch & Bresinsky 2001
Austropaxillus Bresinsky & Jarosch 1999
Gymnopaxillus E. Horak 1966
Serpula (Pers.) Gray 1821
= *Gyrophana* Pat. 1897
= *Plicaturella* Murrill 1910
= *Xylomyzon* Pers. 1825
= *Xylophagus* Link 1809
Family Suillaceae Besl & Bresinsky 1997
Psiloboletinus Singer 1945
Suillus Gray 1821
= *Boletinus* Kalchbr. 1867
= *Boletopsis* Henn. 1898
= *Cricunopus* P. Karst. 1881
= *Euryporus* Quél. 1886
= *Fuscoboletinus* Pomerl. & A.H. Sm. 1962
= *Gastrosuillus* Thiers 1989
= *Ixocomus* Quél. 1888
= *Mariaella* Šutara 1987
= *Peplopus* (Quél.) Quél. ex Moug. & Ferry 1887
= *Pinuzza* Gray 1821
= *Rostkovites* P. Karst. 1881
= *Solenia* Hill ex Kuntze 1898
= *Viscipellis* (Fr.) Quél. 1886
Truncocolumella Zeller 1939
= *Dodgea* Malençon 1939
Family Tapinellaceae C. Hahn 1999
Bondarcevomyces Parmasto 1999
Pseudomerulius Jülich 1979
Tapinella E.-J. Gilbert 1931
= *Sarcopaxillus* Zmitr., Malysheva & E.F. Malysheva 2004
= *Tapinia* (Fr.) P. Karst. 1879

Boletales genera *incertae sedis*
Corditubera Henn. 1897
Corneromyces Ginns 1976
Marthanella States & Fogel 1999
Phaeoradulum Pat. 1900
Order Cantharellales Gäum. 1926
= **Botryobasidiales** Jülich 1981
= **Sistotrematales** Jülich 1981
Family Aphelariaceae Corner 1970
Aphelaria Corner 1950
Phaeoaphelaria Corner 1953
Tumidapexus D.A. Crawford 1954
Family Botryobasidiaceae Jülich 1982
Acladium Link 1809
Allescheriella Henn. 1897
Alysidium Kunze 1817
Botryobasidium Donk 1931
= *Haplotrichum* Link 1824
Suillosporium Pouzar 1958
Family Ceratobasidiaceae G.W. Martin 1948
= Family Cejpomycetaceae Jülich 1981
Ceratobasidium D.P. Rogers 1935
= *Uthatobasidium* Donk 1956
= *Koleroga* Donk 1958
Ceratoporia Ryvarden & de Meijer 2002
Ceratorhiza R.T. Moore 1987
Rhizoctonia DC. 1805
Scotomyces Jülich 1978
Thanatephorus Donk 1956
Family Hydnaceae Chevall. 1826
= Family Clavulinaceae Donk 1970
= Family Cantharellaceae J. Schröt. 1888
= Family Sistotremataceae Jülich 1982
= Family Pterygellaceae Jülich 1982
= Family Heteroacanthellaceae P. Roberts 1998
= Family Repetobasidiaceae Jülich 1982
Burgoa Goid. 1937
Burgella Diederich & Lawrey 2007
Burgellopsis Diederich & Lawrey 2014
Cantharellus Adans.ex Fr. 1821
= *Afrocantharellus* (Eyssart. & Buyck) Tibuhwa 2012
= *Goossensia* Heinem. 1958
Clavulina J. Schröt. 1888
Corallofungus Kobayasi 1983
Craterellus Pers. 1825
= *Pseudocraterellus* Corner 1958
= *Pterygellus* Corner 1966
Gloeomucro R.H. Petersen 1980
Hydnum L. 1753
= *Malacodon* Bataille 1923
Ingoldiella D.E. Shaw 1972
Membranomyces Jülich 1975
Multiclavula R.H. Petersen 1967
Neoburgoa Diederich, E. Zimm. & Lawrey 2016
Parastereopsis Corner 1976
Osteomorpha G. Arnaud ex Watling & W.B. Kendr. 1979
Paullicorticium J. Erikss. 1958
Repetobasidiellum J. Erikss. & Hjortstam 1981
Repetobasidium J. Erikss. 1958
Rogersiomyces J.L. Crane & Schokn. 1978
= *Hyphobasidiofera* K. Matsush. & Matsush. 1996
Sistotrema Fr. 1821
= *Galziniella* Parmasto 1968
= *Heptasporium* Bref. 1908
= *Hydnotrema* Link 1833
Sistotremella Hjortstam 1984
Family Oliveoniaceae P. Roberts 1998
Oliveonia Donk 1958
Family Tulasnellaceae Juel 1897
Pseudotulasnella Lowy 1964
Tulasnella J. Schröt. 1888
= *Epulorhiza* R.T. Moore 1987
Cantharellales genera *incertae sedis*
Boidinella Nakasone 2011
Bulbilla Diederich, Flakus & Etayo 2014
= *Adamflakia* Diederich & Lawrey 2016
Clavulicium Boidin 1957
Minimedusa Weresub & P.M. LeClair 1971
= *Pneumatospora* B. Sutton, Kuthub. & Muid 1984
= *Tricellulortus* Matsush. 1995
Odontiochaete Rick 1940
Radulochaete Rick 1940
Schildia Franchi & M. Marchetti 2015
Stilbotulasnella Oberw. & Bandoni 1982
Order Corticiales K.H. Larss. 2007
Family Corticiaceae Herter 1910
Capillosclerotium Prameela & Deeba 2013
Corticirama Pilát 1957
Corticium Pers. 1794
= *Lyomyces* P. Karst. 1882
= *Mycinema* C. Agardh 1824
Erythricium J. Erikss. & Hjortstam 1970
= *Marchandiobasidium* Diederich & Schultheis 2003
Galzinia Bourdot 1922
Giulia Tassi 1904

Laetisaria Burds. 1979
= *Limonomyces* Stalpers & Loer. 1982
Lawreymyces Lücking & Moncada 2017
Marchandiomyces Diederich & D. Hawksw. 1990
= *Marchandiopsis* Ghobad-Nejhad & Hallenb. 2010
Necator Massee 1898
Tretopileus B.O. Dodge 1946
Waitea Warcup & P.H.B. Talbot 1962

Family Dendrominiaceae Ghobad-Nejhad 2015
Dendrominia Ghobad-Nejhad & Duhem 2013

Family Punctulariaceae Donk 1964
Dendrocorticium M.J. Larsen & Gilb. 1974
Punctularia Pat. 1895
= *Phaeophlebia* W.B. Cooke 1956
Punctulariopsis Ghobad-Nejhad 2010

Family Vuilleminiaceae Maire ex Lotsy 1902
Australovuilleminia Ghobad-Nejhad & Hallenb. 2010
Cytidia Quél. 1888
= *Lomatina* (Fr.) P. Karst. 1892
Vuilleminia Maire 1902

Corticiales genera *incertae sedis*
Ambivina Katz 1974
Amylobasidium Ginns 1988
Leptocorticium Hjortstam & Ryvarden 2002
Melzerodontia Hjortstam & Ryvarden 1980
Nothocorticium Gresl. & Rajchenb. 1999
Papyrodiscus D.A. Reid 1979
Ripexicium Hjortstam 1995

Order Geastrales K. Hosaka & Castellano 2007

Family Geastraceae Corda 1842
Geasteroides Long 1917
= *Terrostella* Long 1945
Geastrum Pers. 1794
= *Astrocitum* Raf. 1806
= *Astrycum* Raf. 1809
= *Coilomyces* Berk. & M.A. Curtis 1854
= *Geasteropsis* Hollós 1903
= *Plecostoma* Desv. 1809
= *Radiigera* Zeller 1944
= *Trichaster* Czern. 1845
Myriostoma Desv. 1809
= *Bovistoides* Lloyd 1919
= *Polystoma* Gray 1821
Nidulariopsis Greis 1935
Phialastrum Sunhede 1989
Schenella T. Macbr. 1911
= *Pyrenogaster* Malençon & Riousset 1977
Sphaerobolus Tode 1790
= *Carpobolus* P. Micheli 1729
= *Carpobolus* P. Micheli ex Willd. 1787
= *Carpobolus* P. Micheli ex Paulet 1808
= *Siropeltis* Arx & R. Garnier 1960

Family Sclerogastraceae Locq. ex P.M. Kirk 2008
Sclerogaster R. Hesse 1891

Geastrales genera *incertae sedis*
Boninogaster Kobayasi 1937

Order Gloeophyllales Thorn 2007

Family Gloeophyllaceae Jülich 1982
Boreostereum Parmasto 1968
Campylomyces Nakasone 2004
Chaetodermella Rauschert 1988
= *Chaetoderma* Parmasto 1968
Gloeophyllum P. Karst. 1882
= *Anisomyces* Theiss. & Syd. 1914
= *Ceratophora* Humb. 1793
= *Phaeocoriolellus* Kotl. & Pouzar 1957
= *Reisneria* Velen. 1922
= *Serda* Adans. 1763
= *Sesia* Adans. 1763
Griseoporia Ginns 1984
Heliocybe Redhead & Ginns 1985
Hispidaedalea Y.C. Dai & S.H. He 2014
Mycothele Jülich 1976
Neolentinus Redhead & Ginns 1985
Osmoporus Singer 1944
Stiptophyllum Ryvarden 1973
Veluticeps Cooke 1879
= *Chaetocarpus* P. Karst. 1889
= *Columnocystis* Pouzar 1959

Gloeophyllales genera *incertae sedis*
Pileodon P. Roberts & Hjortstam 1998

Order Gomphales Jülich 1981

Family Clavariadelphaceae Corner 1970
Beenakia D.A. Reid 1956
= *Psathyrodon* Maas Geest. 1977
Clavariadelphus Donk 1933

Family Gomphaceae Donk 1961
Araeocoryne Corner 1950
Ceratellopsis Konrad & Maubl. 1937
= *Ceratella* Pat. 1887
Delentaria Corner 1970
Destuntzia Fogel & Trappe 1985
Gautieria Vittad. 1831
= *Ciliciocarpus* Corda 1831
= *Uslaria* Nieuwl. 1916
Gloeocantharellus Singer 1945
= *Alectorolophoides* Battarra ex Earle 1909
= *Linderomyces* Singer 1947
Gomphus Pers. 1797
= *Gomphora* Fr. 1825
Phaeoclavulina Brinkmann 1897
= *Chloroneuron* Murrill 1911
Protogautieria A.H. Sm. 1965
Pseudogomphus R. Heim 1970

Ramaria Fr. ex Bonord. 1851
= *Capitoclavaria* Lloyd 1922
= *Cladaria* Ritgen 1828
= *Clavariella* P. Karst. 1881
= *Corallium* G. Hahn 1883
= *Coralloidea* Roussel 1806
= *Coralloides* Tourn. ex Battarra 1755
= *Dendrocladium* (Pat.) Lloyd 1919
Ramaricium J. Erikss. 1954
Terenodon Maas Geest. 1971
Turbinellus Earle 1909

Family Lentariaceae Jülich 1982
Hydnocristella R.H. Petersen 1971
Kavinia Pilát 1938
Lentaria Corner 1950

Order Hymenochaetales Oberw. 1977

Family Hymenochaetaceae Donk 1948
Arambarria Rajchenb. & Pildain 2015
Asterodon Pat. 1894
= *Aciella* (P. Karst.) P. Karst. 1899
= *Hydnochaetella* Sacc. 1898
Aurificaria D.A. Reid 1963
Botryodontia (Hjortstam & Ryvarden) Hjortstam 1987
Clavariachaete Corner 1950
= *Clavariachaeta* Lloyd 1922
Coltricia Gray 1821
= *Coltriciopsis* Teixeira 1991
= *Cycloporus* Murrill 1904
= *Pelloporus* Quél. 1886
= *Polystictus* Fr. 1851
= *Strilia* Gray 1821
= *Volvopolyporus* McGinty 1909
= *Xanthochrous* Pat. 1897
Coltriciella Murrill 1904
Coniferiporia L.W. Zhou & Y.C. Dai 2016
Cylindrosporus L.W. Zhou 2015
Deviodontia (Parmasto) Hjortstam & Ryvarden 2009
Dichochaete Parmasto 2001
Erythromyces Hjortstam & Ryvarden 1990
Fomitiporella Murrill 1907
Fomitiporia Murrill 1907
Fulvifomes Murrill 1914
Fuscoporia Murrill 1907
Hastodontia (Parmasto) Hjortstam & Ryvarden 2009
Hydnochaete Bres. 1896
Hymenochaete Lév. 1846
= *Cerrenella* Murrill 1905
= *Cyclomycetella* Murrill 1904
= *Cycloporellus* Murrill 1907
= *Hymenochaetella* P. Karst. 1889
= *Leptochaete* Lév. 1846
= *Stipitochaete* Ryvarden 1985
Hymenochaetopsis S.H. He & Jiao Yang 2016
= *Hydnoporia* Murrill 1907
= *Pseudochaete* T. Wagner & M. Fisch. 2002
Inocutis Fiasson & Niemelä 1984
Inonotopsis Parmasto 1973
Inonotus P. Karst. 1879
= *Flaviporellus* Murrill 1905
= *Phaeoporus* J. Schröt. 1888
= *Polystictoides* Lázaro Ibiza 1916
Mensularia Lázaro Ibiza 1916
Neomensularia F. Wu, L.W. Zhou & Y.C. Dai 2016
Nothophellinus Rajchenb. 2015
Onnia P. Karst. 1889
= *Mucronoporus* Ellis & Everh. 1889
Phellinidium (Kotl.) Fiasson & Niemelä 1984
Phellinopsis Y.C. Dai 2010
Phellinotus Drechsler-Santos, Robledo & Rajchenb. 2016
Phellinus Quél. 1886
= *Boletus* Dill. 1719
= *Boletus* Dill. ex Gray 1821
= *Boudiera* Lázaro Ibiza 1916
= *Fuscoporella* Murrill 1907
= *Ochroporus* J. Schröt. 1888
= *Ochrosporellus* (Bondartseva & S. Herrera) Bondartseva & S. Herrera 1992
= *Pseudofomes* Lázaro Ibiza 1916
= *Pyropolyporus* Murrill 1903
= *Scalaria* Lázaro Ibiza 1916
= *Scindalma* Hill ex Kuntze 1898
Phellopilus Niemelä, T. Wagner & M. Fisch. 2001
Phylloporia Murrill 1904
= *Cryptoderma* Imazeki 1943
= *Daedaloides* Lázaro Ibiza 1916
= *Phaeolopsis* Murrill 1905
Porodaedalea Murrill 1905
Pseudoinonotus T. Wagner & M. Fisch. 2001
Pyrrhoderma Imazeki 1966
Sanghuangporus Sheng H. Wu, L.W. Zhou & Y.C. Dai 2015
Tropicoporus L.W. Zhou, Y.C. Dai & Sheng H. Wu 2015
Tubulicrinis Donk 1956
Xanthoporia Murrill 1916

Family Neoantrodiellaceae Y.C. Dai, B.K. Cui, Jia J. Chen & H.S. Yuan 2015

Neoantrodiella Y.C. Dai, B.K. Cui, Jia J. Chen & H.S. Yuan 2015

Family Nigrofomitaceae Jülich 1982

Nigrofomes Murrill 1904

= *Melanoporella* Murrill 1907

= *Melanoporia* Murrill 1907

Family Oxyporaceae Zmitr. & V. Malysheva 2014

Oxyporus (Bourdot & Galzin) Donk 1933

Family Rickenellaceae Vizzini 2010

Alloclavaria Dentinger & D.J. McLaughlin 2007

Atheloderma Parmasto 1968

Contumyces Redhead, Moncalvo, Vilgalys & Lutzoni 2002

= *Jacobia* Contu 1998

Cotylidia P. Karst. 1881

= *Bresadolina* Brinkmann 1909

= *Craterella* Pers. 1794

= *Stereophyllum* P. Karst. 1889

Globulicium Hjortstam 1973

Peniophorella P. Karst. 1889

Resinicium Parmasto 1968

Rickenella Raithelh. 1973

Family Schizoporaceae Jülich 1982

Alutaceodontia (Parmasto) Hjortstam & Ryvarden 2002

Basidioradulum Nobles 1967

Echinoporia Ryvarden 1980

= *Echinodia* Pat. 1918

Fibrodontia Parmasto 1968

Hyphodontia J. Erikss. 1958

= *Chaetoporellus* Bondartsev & Singer 1941

Lagarobasidium Jülich 1974

Leucophellinus Bondartsev & Singer 1944

= *Oxyflavus* Ryvarden 1973

Odontiopsis Hjortstam & Ryvarden 1980

Paratrichaptum Corner 1987

Poriodontia Parmasto 1982

Rogersella Liberta & A.J. Navas 1978

Schizopora Velen. 1922

Xylodon (Pers.) Gray 1821

= *Palifer* Stalpers & P.K. Buchanan 1991

Hymenochaetales genera *incertae sedis*

Caeruleomyces Stalpers 2000

Cantharellopsis Kuyper 1986

Cyanotrama Ghobad-Nejhad & Y.C. Dai 2010

Fibricium J. Erikss. 1958

Ginnsia Sheng H. Wu & Hallenb. 2010

Gyroflexus Raithelh. 1981

= *Sphagnomphalia* Redhead, Moncalvo, Vilgalys & Lutzoni 2002

Kurtia Karasiński 2014

Lawrynomyces Karasiński 2013

Muscinupta Redhead, Lücking & Lawrey 2009

Physodontia Ryvarden & H. Solheim 1977

Sidera Miettinen & K.H. Larss. 2011

Skvortzovia Bononi & Hjortstam 1987

Subulicium Hjortstam & Ryvarden 1979

Trichaptum Murrill 1904

= *Hirschioporus* Donk 1933

Tsugacorticium Nakasone & Burds. 2011

Order Hysterangiales K. Hosaka & Castellano 2007

Family Gallaceaceae Locq. ex P.M. Kirk 2008

Austrogautieria E.L. Stewart & Trappe 1985

Gallacea Lloyd 1905

Hallingea Castellano 1996

Family Hysterangiaceae E. Fisch. 1899

Aroramyces Castellano & Verbeken 2000

Circulocolumella S. Ito & S. Imai 1957

= *Stalactocolumella* S. Imai 1950

Clathrogaster Petri 1900

Hysterangium Vittad. 1831

Family Mesophelliaceae Jülich 1982

Andebbia Trappe, Castellano & Amar. 1996

Castoreum Cooke & Massee 1887

Chondrogaster Maire 1926

Gummiglobus Trappe, Castellano & Amar. 1996

Gummivena Trappe & Bougher 2002

Malajczukia Trappe & Castellano 1992

Mesophellia Berk. 1857

= *Potoromyces* Müll. bis ex Hollós 1902

Nothocastoreum G.W. Beaton 1984

Family Phallogastraceae Locq. 1974

Phallogaster Morgan 1893

Protubera Möller 1895

= *Protophallus* Murrill 1910

Family Trappeaceae P.M. Kirk 2008

Phallobata G. Cunn. 1926

Restingomyces Sulzbacher, Grebenc & Baseia 2016

Trappea Castellano 1990

Order Jaapiales Manfr. Binder, K.H. Larss. & Hibbett 2010

Family Jaapiaceae Manfr. Binder, K.H. Larss. & Hibbett 2010

Jaapia Bres. 1911

= *Coniobotrys* Pouzar 1958

Order Lepidostromatales B.P. Hodk. & Lücking 2014

Family Lepidostromataceae Ertz, Eb. Fisch., Killmann, Sérus. & Lawrey 2008

Ertzia B.P. Hodk. & Lücking 2014

Lepidostroma Mägd. & S. Winkl. 1967

Sulzbacheromyces B.P. Hodk. & Lücking 2014

Order Phallales E. Fisch. 1898

Family Claustulaceae G. Cunn. 1931

Claustula K.M. Curtis 1926

Gelopellis Zeller 1939

Kjeldsenia W. Colgan, Castellano & Bougher 1995
Phlebogaster Fogel 1980
Pseudogelopellis K. Tao & B. Liu 1996
Family Gastrosporiaceae Pilát 1934
Gastrosporium Mattir. 1903
Family Phallaceae Corda 1842
Abrachium Baseia & T.S. Cabral 2012
Aporophallus Möller 1895
Aseroë Labill. 1800
Blumenavia Möller 1895
Calvarula Zeller 1939
Clathrus P. Micheli ex L. 1753
= *Anthurus* Kalchbr. & MacOwan 1880
= *Aserophallus* Mont. & Lepr. 1845
= *Clathrella* E. Fisch. 1898
= *Cletria* P. Browne 1756
= *Colonnaria* Raf. 1808
= *Dycticia* Raf. 1808
= *Linderiella* G. Cunn. 1942
Colus Cavalier & Séchier 1835
Echinophallus Henn. 1898
Endoclathrus B. Liu, Yin H. Liu & Z.J. Gu 2000
Endophallus M. Zang & R.H. Petersen 1989
Ileodictyon Tul. & C. Tul. 1844
Itajahya Möller 1895
= *Alboffiella* Speg. 1898
Kobayasia S. Imai & A. Kawam. 1958
Laternea Turpin 1822
Ligiella J.A. Sáenz 1980
Lysurus Fr. 1823
= *Calathiscus* Mont. 1841
= *Desmaturus* (Schltdl.) Kalchbr. 1880
= *Dictyobole* G.F. Atk. & Long 1902
= *Kalchbrennera* Berk. 1876
= *Kupsura* Lloyd 1924
= *Mycopharus* Petch 1926
= *Pharus* Petch 1919
= *Schizmaturus* (Corda) Kalchbr. 1880
= *Simblum* Klotzsch ex Hook. 1831
= *Sinolloydia* C.H. Chow 1936
Mutinus Fr. 1849
= *Aedycia* Raf. 1808
= *Caromyxa* Mont. 1856
= *Corynites* Berk. & M.A. Curtis 1853
= *Cynophallus* (Fr.) Corda 1842
= *Floccomutinus* Henn. 1895
= *Foetidaria* A. St.-Hil. 1835
= *Jansia* Penz. 1899
Neolysurus O.K. Mill., Ovrebo & Burk 1991
Phallus Junius ex L. 1753
= *Clautriavia* (Pat.) Lloyd 1909
= *Cryptophallus* Peck 1897
= *Dictyopeplos* Kuhl & Hasselt 1824
= *Dictyophallus* Corda 1842
= *Dictyophora* Desv. 1809
= *Hymenophallus* Nees 1816
= *Jaczewskia* Mattir. 1912
= *Kirchbaumia* Schulzer 1866
= *Morellus* Eaton 1818
= *Omphalophallus* Kalchbr. 1883
= *Phalloidastrum* Battarra 1755
= *Retigerus* Raddi 1829
= *Satyrus* Bosc 1811
= *Sophronia* Pers. 1827
Protuberella S. Imai & A. Kawam. 1958
Pseudoclathrus B. Liu & Y.S. Bau 1980
Pseudocolus Lloyd 1907
Staheliomyces E. Fisch. 1921
Staurophallus Mont. 1845
Stephanophallus MacOwan 1880
Xylophallus (Schltdl.) E. Fisch. 1933
Phallales genera *incertae sedis*
Saprogaster Fogel & States 2001
Vandasia Velen. 1922
Order Polyporales Gäum. 1926
Family Cerrenaceae Miettinen, Justo & Hibbett 2017
Cerrena Gray 1821
= *Phyllodontia* P. Karst. 1883
Irpiciporus Murrill 1905
Pseudolagarobasidium J.C. Jang & T.Chen 1985
Radulodon Ryvarden 1972
Family Dacryobolaceae Jülich 1981
Amylocystis Bondartsev & Singer ex Singer 1944
Dacryobolus Fr. 1849
= *Gloeocystidium* P. Karst. 1889
Jahnoporus Nuss 1980
Oligoporus Bref. 1888
= *Strangulidium* Pouzar 1967
Osteina Donk 1966
Postia Fr. 1874
= *Hemidiscia* Lázaro Ibiza 1916
= *Ptychogaster* Corda 1838
Spongiporus Murrill 1905
Family Fomitopsidaceae Jülich 1982
= Daedaleaceae Jülich 1981
= Piptoporaceae Jülich 1981
Adustoporia Audet 2017
Anthoporia Karasiński & Niemelä 2016
Antrodia P. Karst. 1879
= *Cartilosoma* Kotl. & Pouzar 1958
= *Coriolellus* Murrill 1905

Antrodiopsis Audet 2017
Brunneoporus Audet 2017
Buglossoporus Kotl. & Pouzar 1966
Daedalea Pers. 1801
= *Agarico-suber* Paulet 1793
= *Striglia* Adans. 1763
Dentiporus Audet 2017
Flavidoporia Audet 2017
Fomitopsis P. Karst. 1881
= *Pilatoporus* Kotl. & Pouzar 1990
= *Placoderma* (Ricken) Ulbr. 1928
= *Ungularia* Lázaro Ibiza 1916
Fragifomes B.K. Cui, M.L. Han & Y.C. Dai 2016
Laricifomes Kotl. & Pouzar 1957
= *Agaricon* Tourn. ex Adans. 1763
= *Agarico-pulpa* Paulet 1793
= *Agaricum* P. Micheli ex Haller 1768
= *Agaricum* Paulet 1812
Lentoporia Audet 2017
Neoantrodia Audet 2017
Neolentiporus Rajchenb. 1995
Niveoporofomes B.K. Cui, M.L. Han & Y.C. Dai 2016
Ranadivia Zmitr. 2018
Resinoporia Audet 2017
Rhizoporia Audet 2017
Rhodofomes Kotl. & Pouzar 1990
Rhodofomitopsis B.K. Cui, M.L. Han & Y.C. Dai 2016
Rubellofomes B.K. Cui, M.L. Han & Y.C. Dai 2016
Subantrodia Audet 2017
Ungulidaedalea B.K. Cui, M.L. Han & Y.C. Dai 2016
Wolfiporia Ryvarden & Gilb. 1984
= *Pachyma* Fr. 1822

Family Fragiliporiaceae Y.C. Dai, B.K. Cui & C.L. Zhao 2015
Fragiliporia Y.C. Dai, B.K. Cui & C.L. Zhao 2015

Family Gelatoporiaceae Miettinen, Justo & Hibbett 2017
Cinereomyces Jülich 1982
Gelatoporia Niemelä 1985
Obba Miettinen & Rajchenb. 2012
Sebipora Miettinen 2012

Family Grifolaceae Jülich 1982
Aegis Gómez-Montoya, Rajchenb. & Robledo 2017
Grifola Gray 1821
= *Cladodendron* Lázaro Ibiza 1916
= *Polypilus* P. Karst. 1881

Family Hyphodermataceae Jülich 1981
Hyphoderma Fr. 1833
= *Mutatoderma* (Parmasto) C.E. Gómez 1976
= *Pycnodon* Underw. 1898

Family Incrustoporiaceae Jülich 1982
Gloeoporellus Zmitr. 2018
Incrustoporia Domanski 1963
Piloporia Niemelä 1982
Skeletocutis Kotl. & Pouzar 1958
= *Leptotrimitus* Pouzar 1966
Tyromyces P. Karst. 1881

Family Irpicaceae Spirin & Zmitr. 2003
Byssomerulius Parmasto 1967
Ceriporia Donk 1933
Cytidiella Pouzar 1954
Efibula Sheng H. Wu 1990
Emmia Zmitr., Spirin & Malysheva 2006
Flavodon Ryvarden 1973
Gloeoporus Mont. 1842
= *Vitreoporus* Zmitr. 2018
Hydnopolyporus D.A.Reid 1962
Irpex Fr. 1825
Leptoporus Quél. 1886
Meruliopsis Bondartsev 1959
Raduliporus Spirin & Zmitr. 2006
Resiniporus Zmitr. 2018
Trametopsis Tomšovský 2008

Family Ischnodermataceae Jülich 1981
Ischnoderma P. Karst. 1879
= *Lasiochlaena* Pouzar 1990

Family Laetiporaceae Jülich 1981
= Phaeolaceae Jülich 1981
Kusaghiporia J. Hussein, S. Tibell & Tubuhwa 2018
Laetiporus Murrill 1904
= *Cladoporus* (Pers.) Chevall. 1826
Phaeolus (Pat.) Pat. 1900
= *Choriphyllum* Velen. 1922
= *Spongiosus* Lloyd ex Torrend 1920

Family Meripilaceae Jülich 1982
= Rigidoporaceae Jülich 1981
Meripilus P. Karst. 1882
= *Flabellopilus* Kotl. & Pouzar 1957
Pseudonadsoniella T.O. Kondr. & S.Y. Kondr. 2015
Rigidoporus Murrill 1905
= *Leucofomes* Kotl. & Pouzar 1957

Family Meruliaceae Rea 1922
= Climacodontaceae Jülich 1981
= Phlebiaceae Jülich 1981
Aurantiopileus Ginns, D.L. Lindner & T.J. Baroni 2010
Aurantiporus Murrill 1905
Ceriporiopsis Domański 1963
Climacodon P. Karst. 1881

Crustodontia Hjortstam & Ryvarden 2005
Geesterania Westphalen, Tomšovský & Rajchenb. 2018
Hermanssonia Zmitr. 2018
Hydnophanerochaete Sheng H. Wu & C.C. Chen 2018
Hydnophlebia Parmasto 1967
Lilaceophlebia (Parmasto) Spirin & Zmitr. 2004
Luteoporia F. Wu, Jia J. Chen & S.H. He 2016
Merulius Fr. 1821
Mycoacia Donk 1931
Mycoaciella J. Erikss. & Ryvarden 1978
= *Ceraceohydnum* Jülich 1978
Odoria V. Papp & Dima 2017
Pappia Zmitr. 2018
Phlebia Fr. 1821
= *Jacksonomyces* Jülich 1979
Phlebiporia Jia J. Chen, B.K. Cui & Y.C. Dai 2014
Physisporinus P. Karst. 1889
Sarcodontia Schulzer 1866
= *Oxydontia* L.W. Mill. 1933
Scopuloides (Massee) Höhn. & Litsch. 1908
Stereophlebia Zmitr. 2018

Family Panaceae Miettinen, Justo & Hibbett 2017
Cymatoderma Jungh. 1840
= *Actinostroma* Klotzsch 1843
= *Beccariella* Ces. 1879
= *Cladoderris* Pers. ex Berk. 1842
Panus Fr. 1838
= *Lentinopanus* Pilát 1941

Family Phanerochaetaceae Jülich 1982
= Hapalopilaceae Jülich 1981
= Bjerkanderaceae Jülich 1981
Bjerkandera P. Karst. 1879
= *Myriadoporus* Peck 1884
Donkia Pilát 1937
Efibulella Zmitr. 2018
Geliporus Yuan Yuan, Jia J. Chen & S.H. He 2017
Hapalopilus P. Karst. 1881
Hyphodermella J. Erikss. & Ryvarden 1976
Odontoefibula C.C. Chen & Sheng H. Wu 2018
Oxychaete Miettinen 2016
Phaeophlebiopsis D. Floudas & Hibbett 2015
Phanerina Miettinen 2016
Phanerochaete P. Karst. 1889
= *Atheliachaete* Spirin & Zmitr. 2011
= *Grandiniella* P. Karst. 1895
= *Hjortstamia* Boidin & Gilles 2003
= *Xerocarpus* P. Karst. 1881
Phlebiopsis Jülich 1978
Pirex Hjortstam & Ryvarden 1985
Porostereum Pilát 1937
Rhizochaete Gresl., Nakasone & Rajchenb. 2004
Riopa D.A. Reid 1969
= *Sporotrichum* Link 1809
Terana Adans. 1763
= *Pulcherricium* Parmasto 1968

Family Podoscyphaceae D.A. Reid 1965
Abortiporus Murrill 1904
= *Heteroporus* Lázaro Ibiza 1916
= *Irpicium* Bref. 1912
= *Sporotrichopsis* Stalpers 2000
Podoscypha Pat. 1900
Pouzaroporia Vampola 1992

Family Polyporaceae Fr. ex Corda 1839
= Ganodermataceae (Donk) Donk 1948
= Coriolaceae Singer 1961
= Cryptoporaceae Jülich 1981
= Echinochaetaceae Jülich 1981
= Fomitaceae Jülich 1981
= Grammotheleaceae Jülich 1981
= Haddowiaceae Jülich 1981
= Microporaceae Jülich 1981
= Pachykytosporaceae Jülich 1981
= Perenniporiaceae Jülich 1981
= Sparsitubaceae Jülich 1981
= Lophariaceae Boidin, Mugnier & Canales 1998
= Trametaceae Boidin, Mugnier & Canales 1998
Abundisporus Ryvarden 1999
Amauroderma Murrill 1905
= *Magoderna* Steyaert 1972
Atroporus Ryvarden 1973
= *Cladomeris* Quél. 1886
= *Dendropolyporus* (Pouzar) Jülich 1982
= *Mycelithe* Gasp. 1841
Australoporus P.K. Buchanan & Ryvarden 1988
Bresadolia Speg. 1883
Cerarioporia F. Wu, L.W. Zhou & J. Si 2016
Cerioporus Quél. 1886
= *Grandinioides* Banker 1906
= *Melanopus* Pat. 1887
= *Mycobonia* Pat. 1894
= *Petaloides* Lloyd ex Torrend 1920
Cinereomycetella Zmitr. 2018
Colospora Miettinen & Spirin 2015
Coriolopsis Murrill 1905
Cryptoporus (Peck) Shear 1902
Daedaleopsis J. Schröt. 1888
= *Apoxona* Donk 1969
Datronia Donk 1966
Datroniella B.K. Cui, Hai J. Li & Y.C. Dai 2014

Dentocorticium (Parmasto) M.J. Larsen & Gilb. 1974
= *Dendrodontia* Hjortstam & Ryvarden 1980
Dextrinoporus H.S. Yuan 2018
Dichomitus D.A. Reid 1965
Donkioporia Kotl. & Pouzar 1973
Donkioporiella L.W. Zhou 2016
Earliella Murrill 1905
Echinochaete D.A. Reid 1963
= *Dendrochaete* G. Cunn. 1965
Endopandanicola Tibpromma & K.D. Hyde 2018
Epithele (Pat.) Pat. 1900
Epithelopsis Jülich 1976
Favolus Fr. 1828
Flammeopellis Y.C. Dai, B.K. Cui & C.L. Zhao 2014
Fomes (Fr.) Fr. 1849
= *Elfvingiella* Murrill 1914
Globifomes Murrill 1904
= *Placodes* Quél. 1886
= *Ungulina* Pat. 1900
Fomitella Murrill 1905
Foraminispora Robledo, Costa-Rezende & Drechsler-Santos 2017
Funalia Pat. 1900
Furtadoa Costa-Rezende, Robledo & Drechsler-Santos 2017
Ganoderma P. Karst. 1881
= *Elfvingia* P. Karst. 1889
Grammothele Berk. & M.A. Curtis 1868
Grammothelopsis Jülich 1982
Haddowia Steyaert 1972
Haploporus Bondartsev & Singer 1944
Hexagonia Fr. 1835
Hornodermoporus Teixeira 1993
Humphreya Steyaert 1972
Laccocephalum McAlpine & Tepper 1895
Leifiporia Y.C. Dai, F. Wu & C.L. Zhao 2016
Lentinus Fr. 1825
= *Lentodiellum* Murrill 1915
= *Lentodium* Morgan 1895
= *Leucoporus* Quél. 1886
= *Polyporellus* P. Karst. 1879
Lignosus Lloyd ex Torrend 1920
Lopharia Kalchbr. & MacOwan 1881
= *Lloydella* Bres. 1901
= *Thwaitesiella* Massee 1892
Megasporia B.K. Cui, Y.C. Dai & Hai J. Li 2013
Megasporoporia Ryvarden & J.E. Wright 1982
Megasporoporiella B.K. Cui, Y.C. Dai & Hai J. Li 2013
Melanoderma B.K. Cui & Y.C. Dai 2011
Microporellus Murrill 1905
Microporus P. Beauv. 1805
Mollicarpus Ginns 1984
Murinicarpus B.K. Cui & Y.C. Dai 2019
Myriothele Nakasone 2013
Navisporus Ryvarden 1980
Neodatronia B.K. Cui, Hai J. Li & Y.C. Dai 2014
Neodictyopus Palacio, Robledo, Reck & Drechsler-Santos 2017
Neofavolus Sotome & T. Hatt. 2013
Neofomitella Y.C. Dai, Hai J. Li & Vlasák 2014
Pachykytospora Kotl. & Pouzar 1963
Perenniporia Murrill 1942
= *Physisporus* Chevall. 1826
Perenniporiella Decock & Ryvarden 2003
Perenniporiopsis C.L. Zhao 2017
Phaeotrametes Lloyd ex J.E. Wright 1966
= *Phaeotrametes* Lloyd 1915
Picipes Zmitr. & Kovalenko 2016
Pilatotrama Zmitr. 2018
Podofomes Pouzar 1966
Polyporopsis Audet 2010
Polyporus [P. Micheli ex Adans.] Fr. 1821
Porogramme (Pat.) Pat. 1900
= *Tinctoporia* Murrill 1907
Pseudofavolus Pat. 1900
Pseudomegasporoporia X.H. Ji & F. Wu 2017
Pseudopiptoporus Ryvarden 1980
Pyrofomes Kotl. & Pouzar 1964
Rubroporus Log.-Leite, Ryvarden & Groposo 2002
Sparsitubus L.W. Hsu & J.D. Zhao 1980
Szczepkamyces Zmitr. 2018
Theleporus Fr. 1847
Thermophymatospora Udagawa, Awao & Abdullah 1986
Tinctoporellus Ryvarden 1979
Tomophagus Murrill 1905
Trametes Fr. 1836
= *Artolenzites* Falck 1909
= *Cellularia* Bull. 1788
= *Cellulariella* Zmitr. & Malysheva 2014
= *Coriolus* Quél. 1886
= *Cubamyces* Murrill 1905
= *Leiotrametes* Welti & Courtec. 2012
= *Lenzites* Fr. 1836
= *Pseudotrametes* Bondartsev & Singer 1944
= *Pycnoporus* P. Karst. 1881
= *Tomentoporus* Ryvarden 1973
= *Trametella* Pinto-Lopes 1952
Truncospora Pilát 1953
= *Loweporus* J.E. Wright 1976
Vanderbylia D.A. Reid 1973
Yuchengia B.K. Cui & K.T. Steffen 2013

Family Sparassidaceae Jülich 1981
Crustoderma Parmasto 1968
Pycnoporellus Murrill 1905
= *Aurantiporellus* Murrill 1905
Sparassis Fr. 1819
= *Masseeola* Kuntze 1891
Family Steccherinaceae Parmasto 1968
= Mycorraphiacaeae Jülich 1981
Antella Miettinen 2016
Antrodiella Ryvarden & I. Johans. 1980
Atraporiella Ryvarden 2007
Austeria Miettinen 2016
Butyrea Miettinen 2016
Cabalodontia Piątek 2004
Caudicicola Miettinen, M. Kulju & Kotir. 2017
Citripora Miettinen 2016
Elaphroporia Z.Q. Wu & C.L. Zhao 2018
Flabellophora G. Cunn. 1965
Flaviporus Murrill 1905
= *Baeostratoporus* Bondartsev & Singer 1944
Frantisekia Spirin & Zmitr. 2007
Junghuhnia Corda 1842
= *Chaetoporus* P. Karst. 1890
Lamelloporus Ryvarden 1987
Loweomyces (Kotl. & Pouzar) Jülich 1982
Metuloidea G. Cunn. 1965
Mycorrhaphium Maas Geest. 1962
Niemelaea Zmitr., Ezhov & Khimich 2015
Nigroporus Murrill 1905
Steccherinum Gray 1821
= *Etheirodon* Banker 1902
= *Odontina* Pat. 1887
Trullella Zmitr. 2018
Xanthoporus Audet 2010
Polyporales genera *incertae sedis*
Aegeritopsis Höhn. 1903
Amaropostia B.K. Cui, L.L. Shen & Y.C. Dai 2019
Amaurohydnum Jülich 1978
Amauromyces Jülich 1978
Amethicium Hjortstam 1983
Amyloporia Singer 1944
Aquascypha D.A. Reid 1965
Auriporia Ryvarden 1973
Australicium Hjortstam & Ryvarden 2002
Australohydnum Jülich 1978
Austrolentinus Ryvarden 1991
Bourdotiella Duhem & Schultheis 2011
Bulbillomyces Jülich 1974
= *Aegerita* Pers. 1794
= *Crocysporium* Corda 1837
= *Dermosporium* Link 1816
Calcipostia B.K. Cui, L.L. Shen & Y.C. Dai 2019
Candelabrochaete Boidin 1970
Climacocystis Kotl. & Pouzar 1958
Columnodontia Jülich 1979
Conohypha Jülich 1975
Coralloderma D.A. Reid 1965
Cordochaete Sanyal, Samita, Dhingra & Avn.P. Singh 2013
Cryptomphalina R. Heim 1966
Cyanodontia Hjortstam 1987
Cyanosporus McGinty 1909
Cystidiopostia B.K. Cui, L.L. Shen & Y.C. Dai 2019
Dendrophlebia Dhingra & Priyanka 2011
Diacanthodes Singer 1945
Diplomitoporus Domański 1970
= *Fabisporus* Zmitr. 2001
Erastia Niemelä & Kinnunen 2005
Faerberia Pouzar 1981
= *Geopetalum* Pat. 1887
Fibroporia Parmasto 1968
Fuscopostia B.K. Cui, L.L. Shen & Y.C. Dai 2019
Gilbertsonia Parmasto 2001
Globosomyces Jülich 1980
Globuliciopsis Hjortstam & Ryvarden 2004
Gyrophanopsis Jülich 1979
= *Hyphodermopsis* Jülich 1982
Henningsia Möller 1895
Hymenogramme Mont. & Berk. 1844
Hyphodontiastra Hjortstam 1999
Hypochnicium J. Erikss. 1958
Inflatostereum D.A. Reid 1965
Irpicochaete Rick 1940
Laetifomes T. Hatt. 2001
Macrohyporia I. Johans. & Ryvarden 1979
Meruliophana Duhem & Buyck 2011
Mycoleptodonoides Nikol. 1952
Mycorrhaphoides Hembrom, K. Das & Hallenb. 2017
Nigrohydnum Ryvarden 1987
Phaneroites Hjortstam & Ryvarden 2010
Phanerodontia Hjortstam & Ryvarden 2010
Phlebiella P. Karst. 1890
Piptoporellus B.K. Cui, M.L. Han & Y.C. Dai 2016
Pseudofibroporia Yuan Y. Chen, B.K. Cui & Y.C. Dai 2017
Repetobasidiopsis Dhingra & Avn.P. Singh 2008
Rhodonia Niemelä 2005
= *Caloporus* P. Karst. 1881

Rickiopora Westphalen, Tomšovský & Rajchenb. 2016
Roseofavolus T. Hatt. 2003
Roseograndinia Hjortstam & Ryvarden 2005
Ryvardenia Rajchenb. 1994
Sarcoporia P. Karst. 1894
Skeletohydnum Jülich 1979
Sparassiella Schwarzman 1964
Spathulina Pat. 1900
Spongioides Lázaro Ibiza 1916
Spongipellis Pat. 1887
Stegiacantha Maas Geest. 1966
Taiwanofungus Sheng H. Wu, Z.H. Yu, Y.C. Dai & C.H. Su 2004
Uncobasidium Hjortstam & Ryvarden 1978

Order Russulales Kreisel ex P.M. Kirk, P.F. Cannon & J.C. David 2001

Family Albatrellaceae Nuss 1980
Albatrellopsis Teixeira 1993
Albatrellus Gray 1821
= *Ovinus* (Lloyd) Torrend 1920
Byssoporia M.J. Larsen & Zak 1978
Leucogaster R. Hesse 1882
Leucophleps Harkn. 1899
= *Cremeogaster* Mattir. 1924
Mycolevis A.H. Sm. 1965
Polyporoletus Snell 1936
Scutiger Paulet 1808

Family Auriscalpiaceae Maas Geest. 1963
Amylonotus Ryvarden 1975
Artomyces Jülich 1982
Auriscalpium Gray 1821
= *Pleurodon* Quél. ex P. Karst. 1881
Dentipratulum Domański 1965
Lentinellus P. Karst. 1879
= *Hemicybe* P. Karst. 1879
Stalpersia Parmasto 2001

Family Bondarzewiaceae Kotl. & Pouzar 1957
Amylaria Corner 1955
Amylosporus Ryvarden 1973
= *Rigidoporopsis* I. Johans. & Ryvarden 1979
Bondarzewia Singer 1940
Gloiodon P. Karst. 1879
= *Leaia* Banker 1906
= *Sclerodon* P. Karst. 1889
Heterobasidion Bref. 1888
Laurilia Pouzar 1959
Lauriliella Nakasone & S.H. He 2017
Stecchericium D.A. Reid 1963
Wrightoporia Pouzar 1966

Family Echinodontiaceae Donk 1961
= Amylostereaceae Boidin, Mugnier & Canales 1998
Amylostereum Boidin 1958
= *Lloydellopsis* Pouzar 1959
= *Trichocarpus* P. Karst. 1889
Echinodontiellum S.H. He & Nakasone 2017
Echinodontium Ellis & Everh. 1900
= *Hydnofomes* Henn. 1900
Larssoniporia Y.C. Dai, Jia J. Chen & B.K. Cui 2015

Family Hericiaceae Donk 1964
Dentipellicula Y.C. Dai & L.W. Zhou 2013
Dentipellis Donk 1962
= *Amylodontia* Nikol. 1967
Hericium Pers. 1794
= *Friesites* P. Karst. 1879
= *Hericium* Schrank 1786
= *Hericius* Juss. 1789
= *Martella* Endl. 1836
= *Medusina* Chevall. 1826
Laxitextum Lentz 1956
Pseudowrightoporia Y.C. Dai, Jia J. Chen & B.K. Cui 2015
Wrightoporiopsis Y.C. Dai, Jia J. Chen & B.K. Cui 2015

Family Hybogasteraceae Jülich 1982
Hybogaster Singer 1964

Family Peniophoraceae Lotsy 1907
= Lachnocladiaceae Jülich 1982
Amylofungus Sheng H. Wu 1996
Asterostroma Massee 1889
Baltazaria Leal-Dutra, Dentinger & G.W. Griff. 2018
Dendrophora (Parmasto) Chamuris 1987
Dichostereum Pilát 1926
Duportella Pat. 1915
Entomocorticium H.S. Whitney, Bandoni & Oberw. 1987
Gloiothele Bres. 1920
Lachnocladium Lév. 1846
= *Eriocladus* Lév. 1846
= *Stelligera* R. Heim 1938
= *Stelligera* R. Heim ex Doty 1948
Licrostroma P.A. Lemke 1964
= *Michenera* Berk. & M.A. Curtis 1868
Metulodontia Parmasto 1968
Peniophora Cooke 1879
= *Cryptochaete* P. Karst. 1889
= *Gloeopeniophora* Höhn. & Litsch. 1907
= *Sterellum* P. Karst. 1889

Sceptrulum K.H. Larss. 2014
Scytinostroma Donk 1956
Vararia P. Karst. 1898
= *Asterostromella* Höhn. & Litsch. 1907
= *Denrophysellum* Parmasto 1968
Vesiculomyces E. Hagstr. 1977

Family Russulaceae Lotsy 1907
Boidinia Stalpers & Hjortstam 1982
Gloeopeniophorella Rick 1934
Lactarius Pers. 1797
= *Arcangeliella* Cavara 1900
= *Galorrheus* (Fr.) Fr. 1825
= *Gastrolactarius* R. Heim 1971
= *Gastrolactarius* R. Heim ex J.M. Vidal 2005
= *Gloeocybe* Earle 1909
= *Lactariella* J. Schröt. 1889
= *Zelleromyces* Singer & A.H. Sm. 1960
Lactifluus (Pers.) Roussel 1806
= *Lactariopsis* Henn. 1901
= *Pleurogala* Redhead & Norvell 1993
Multifurca Buyck & V. Hofst. 2008
Pseudoxenasma K.H. Larss. & Hjortstam 1976
Russula Pers. 1796
= *Bucholtzia* Lohwag 1924
= *Cystangium* Singer & A.H. Sm. 1960
= *Dixophyllum* Earle 1909
= *Elasmomyces* Cavara 1897
= *Gymnomyces* Massee & Rodway 1898
= *Lactarelis* Earle 1909
= *Macowanites* Kalchbr. 1882
= *Martellia* Mattir. 1900
= *Omphalomyces* Battarra ex Earle 1909
= *Phaeohygrocybe* Henn. 1901
= *Russulina* J. Schröt. 1889

Family Stereaceae Pilát 1930
Acanthobasidium Oberw. 1965
Acanthofungus Sheng H. Wu, Boidin & C.Y. Chien 2000
Acanthophysellum Parmasto 1967
Acanthophysium (Pilát) G. Cunn. 1963
Aleurobotrys Boidin 1986
Aleurodiscus Rabenh. ex J. Schröt. 1888
= *Aleurodiscus* Rabenh. 1874
= *Aleurodiscus* Cooke 1885
Aleuromyces Boidin & Gilles 2002
Amylohyphus Ryvarden 1978
Amylosporomyces S.S. Rattan 1977
Confertextum Priyanka & Dhingra 2014
Conferticium Hallenb. 1980
Dextrinocystidium Sheng H. Wu 1996
Gloeocystidiellum Donk 1931
Gloeocystidiopsis Jülich 1982
Gloeomyces Sheng H. Wu 1996
Gloeosoma Bres. 1920
Matula Massee 1888
Megalocystidium Jülich 1978
Neoaleurodiscus Sheng H. Wu 2010
Scotoderma Jülich 1974
Stereum Hill ex Pers. 1794
= *Haematostereum* Pouzar 1959
Xylobolus P. Karst. 1881

Family Xenasmataceae Oberw. 1965
Xenasma Donk 1957
Xenasmatella Oberw. 1965
Xenosperma Oberw. 1965

Russulales genera *incertae sedis*
Aleurocystidiellum P.A. Lemke 1964
Dentipellopsis Y.C. Dai & L.W. Zhou 2013
Dichantharellus Corner 1966
Dichopleuropus D.A. Reid 1965
Gloeoasterostroma Rick 1938
Gloeodontia Boidin 1966
Gloeohypochnicium (Parmasto) Hjortstam 1987
Haloaleurodiscus N. Maek., Suhara & K. Kinjo 2005
Laeticutis Audet 2010
Neoalbatrellus Audet 2010
Perplexostereum Ryvarden & S. Tutka 2014
Polypus Audet 2010
Scopulodontia Hjortstam 1998
Scytinostromella Parmasto 1968
= *Confertobasidium* Jülich 1972
Xeroceps Audet 2010

Order Sebacinales M. Weiss, Selosse, Rexer, A. Urb. & Oberw. 2004

Family Sebacinaceae K. Wells & Oberw. 1982
Chaetospermum Sacc. 1892
Ditangium P. Karst. 1867
= *Craterocolla* Bref. 1888
= *Poroidea* Göttinger ex G. Winter 1885
Efibulobasidium K. Wells 1975
Globulisebacina Oberw., Garnica & K. Riess 2014
Helvellosebacina Oberw., Garnica & K. Riess 2014
Paulisebacina Oberw., Garnica & K. Riess 2014
Sebacina Tul. & C. Tul. 1871
= *Atkinsonia* Lloyd 1916
= *Collodendrum* Clem. 1909
= *Corticioides* Lloyd 1908
= *Cristella* Pat. 1887
= *Opadorhiza* T.F. Andersen & R.T. Moore 1996
= *Soppittiella* Massee 1892
= *Tremellodendron* G.F. Atk. 1902
Tremelloscypha D.A. Reid 1979
= *Tremellostereum* Ryvarden 1986

Family Serendipitaceae M. Weiss, Waller, A. Zuccaro & Selosse 2016
Serendipita P. Roberts 1993
= *Piriformospora* Sav. Verma, Aj. Varma, Rexer, G. Kost & P. Franken 1998
Order Stereopsidales Sjökvist, E. Larss., B.E. Pfeil & K.H. Larss. 2013
Family Stereopsidaceae Sjökvist, E. Larss., B.E. Pfeil & K.H. Larss. 2013
Stereopsis D.A. Reid 1965
Order Thelephorales Corner ex Oberw. 1976
Family Bankeraceae Donk 1961
Bankera Coker & Beers ex Pouzar 1955
Boletopsis Fayod 1889
Corneroporus T. Hatt. 2001
Hydnellum P. Karst. 1879
= *Calodon* P. Karst. 1881
= *Phaeodon* J. Schröt. 1888
Sarcodon Quél. ex P. Karst. 1881
Family Thelephoraceae Chevall. 1826
Amaurodon J. Schröt. 1888
Gymnoderma Humb. 1793
Lenzitopsis Malençon & Bertault 1963
Parahaplotrichum W.A. Baker & Partr. 2001
Phellodon P. Karst. 1881
Polyozellus Murrill 1910
= *Phyllocarbon* Lloyd 1920
Pseudotomentella Svrček 1958
Skepperia Berk. 1857
Thelephora Ehrh. ex Willd. 1787
= *Merisma* Pers. 1797
= *Phylacteria* (Pers.) Pat. 1887
= *Pseudothelephora* Lloyd 1919
= *Scyphopilus* P. Karst. 1881
Tomentella Pers. ex Pat. 1887
= *Acrotamnium* Nees 1816
= *Caldesiella* Sacc. 1877
= *Cyphellina* Rick 1959
= *Hypochnus* Fr. 1818
= *Karstenia* Britzelm. 1897
Tomentellopsis Hjortstam 1970
= *Byssocristella* M.P. Christ. & J.E.B. Larsen 1970
Thelephorales genera *incertae sedis*
Thelephorella P. Karst. 1889
Order Trechisporales K.H. Larss. 2007
Family Hydnodontaceae Jülich 1982
Brevicellicium K.H. Larss. & Hjortstam 1978
Dextrinocystis Gilb. & M. Blackw. 1988
Dextrinodontia Hjortstam & Ryvarden 1980
Hydnodon Banker 1913
= *Pseudohydnum* Rick 1904
Litschauerella Oberw. 1965
Luellia K.H. Larss. & Hjortstam 1974
Porpomyces Jülich 1982
Scytinopogon Singer 1945
Sistotremastrum J. Erikss. 1958
Sphaerobasidium Oberw. 1965
Subulicystidium Parmasto 1968
Trechispora P. Karst. 1890
= *Cristelloporia* I. Johans. & Ryvarden 1979
= *Echinotrema* Park.-Rhodes 1955
= *Fibriciellum* J. Erikss. & Ryvarden 1975
= *Fibuloporia* Bondartsev & Singer 1941
= *Fibuloporia* Bondartsev & Singer 1944
= *Murrilloporus* Ryvarden 1985
= *Tomentella* P. Karst. 1889
Tubulicium Oberw. 1965
= *Tubulixenasma* Parmasto 1965
Order Tremellodendropsidales Vizzini 2014
Family Tremellodendropsidaceae Jülich 1982
Tremellodendropsis (Corner) D.A. Crawford 1954
= *Polyozus* P. Karst. 1881
= *Pseudotremellodendron* D.A. Reid 1957
Agaricomycetes genera *incertae sedis*
Akenomyces G. Arnaud ex D. Hornby 1984
Aldridgea Massee 1892
Arthrodochium R.F. Castañeda & W.B. Kendr. 1990
Arualis Katz 1980
Blasiphalia Redhead 2007
Bridgeoporus T.J. Volk, Burds. & Ammirati 1996
Cenangiomyces Dyko & B. Sutton 1979
Ceraceopsis Hjortstam & Ryvarden 2007
Cilicia Fr. 1825
Corticomyces A.I. Romero & S.E. López 1989
Cruciger R. Kirschner & Oberw. 1999
Dendrosporomyces Nawawi, J. Webster & R.A. Davey 1977
Ellula Nag Raj 1980
Fibulocoela Nag Raj 1978
Fibulotaeniella Marvanová & Bärl. 1988
Geotrichopsis Tzean & Estey 1991
Gloeosynnema Seifert & G. Okada 1988
Glomerulomyces A.I. Romero & S.E. López 1989
Glutinoagger Sivan. & Watling 1980
Hallenbergia Dhingra & Priyanka 2011
Heteroacanthella Oberw. 1990
Intextomyces J. Erikss. & Ryvarden 1976
Korupella Hjortstam & P. Roberts 2000
Loreleia Redhead, Moncalvo, Vilgalys & Lutzoni 2002
Minostroscyta Hjortstam & Ryvarden 2001
Mylittopsis Pat. 1895
Myriococcum Fr. 1823
Odonticium Parmasto 1968
= *Leifia* Ginns 1998
Pagidospora Drechsler 1960

Phlyctibasidium Jülich 1974
Purpureocorticium S.H. Wu 2017
Pycnovellomyces R.F. Castañeda 1987
Riessia Fresen. 1852
Riessiella Jülich 1985
Taiwanoporia T.T. Chang & W.N. Chou 2003
Titaeella G. Arnaud ex K. Ando & Tubaki 1985
Trechinothus E.C. Martini & Trichiès 2004
Trimitiella Dhingra 2008
= *Trimitiella* Dhingra 2006
Tubulicrinopsis Hjortstam & Kotir. 2007
Xerotus Fr. 1828
= *Xerotinus* Rchb. 1828

Class Dacrymycetes Doweld 2001
Order Dacrymycetales Henn. 1897
Family Cerinomycetaceae Jülich 1982
Cerinomyces G.W. Martin 1949
Family Dacrymycetaceae J. Schröt. 1888
Calocera (Fr.) Fr. 1828
= *Calopposis* Lloyd 1925
= *Corynoides* Gray 1821
= *Dacryomitra* Tul. & C. Tul. 1872
Cerinosterus R.T. Moore 1987
Dacrymyces Nees 1816
= *Arrhytidia* Berk. & M.A. Curtis 1849
= *Hydromycus* Raf. 1808
= *Septocolla* Bonord. 1851
Dacryonaema Nannf. 1947
Dacryopinax G.W. Martin 1948
Dacryoscyphus R. Kirschner & Zhu L. Yang 2005
Ditiola Fr. 1822
= *Dacryopsis* Massee 1891
Femsjonia Fr. 1849
Guepiniopsis Pat. 1883
Heterotextus Lloyd 1922

Order Unilacrymales Shirouzu, Tokum. & Oberw. 2013
Family Unilacrymaceae Shirouzu, Tokum. & Oberw. 2013
Unilacryma Shirouzu, Tokum. & Oberw. 2013

Class Tremellomycetes Doweld 2001
Order Cystofilobasidiales Fell, Roeijmans & Boekhout 1999
Family Cystofilobasidiaceae K. Wells & Bandoni 2001
Cystofilobasidium Oberw. & Bandoni 1983
Family Mrakiaceae X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Itersonilia Derx 1948
Krasilnikovozyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Mrakia Y. Yamada & Komag. 1987
Phaffia M.W. Mill., Yoney. & Soneda 1976
= *Rhodomyces* Wettst. 1885
= *Xanthophyllomyces* Golubev 1995
Tausonia Babeva 1998
Udeniomyces Nakase & Takem. 1992
Vustinia Kachalkin, Turchetti & Yurkov 2019

Order Filobasidiales Jülich 1981
Family Filobasidiaceae L.S. Olive 1968
Filobasidium L.S. Olive 1968
Goffeauzyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Heterocephalacria Berthier 1980
Naganishia S. Goto 1963
Syzygospora G.W. Martin 1937
Family Piskurozymaceae X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Piskurozyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Solicoccozyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015

Order Holtermanniales Libkind, Wuczk., Turchetti & Boekhout 2011
Family Holtermanniaceae Redhead 2015
Holtermannia Sacc. & Traverso 1910
Holtermanniella Libkind, Wuczk., Turchetti & Boekhout 2011

Order Tremellales Fr. 1821
Family Bulleraceae X. Zh. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Bullera Derx 1930
= *Bulleromyces* Boekhout & Á. Fonseca 1991
Fonsecazyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Genolevuria X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Pseudotremella X.Z. Liu, F.Y. Bai, A.M. Yurkov, M. Groenew. & Boekhout 2015
Family Bulleribasidiaceae X. Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Bulleribasidium J.P. Samp., M. Weiss & R. Bauer 2002
= *Mingxiaea* F.Y. Bai, Q.M. Wang, Boekhout & Nakase 2011
Derxomyces F.Y. Bai & Q.M. Wang 2008
Dioszegia Zsolt 1957
Hannaella F.Y. Bai & Q.M. Wang 2008
Nielozyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Vishniacozyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015

Family Carcinomycetaceae Oberw. & Bandoni 1982
Carcinomyces Oberw. & Bandoni 1982
Family Cryptococcaceae Kütz. ex Castell. & Chalm. 1919
Cryptococcus Vuill. 1901
= *Atelosaccharomyces* Beurm. & Gougerot 1909
= *Cryptococcus* Kütz. 1833
= *Filobasidiella* Kwon-Chung 1976
= *Tsuchiyaea* Y. Yamada, H. Kawas., Itoh, I. Banno & Nakase 1988
Kwoniella Statzell & Fell 2008
Family Cuniculitremaceae J.P. Samp., R. Kirschner & M. Weiss 2001
Fellomyces Y. Yamada & I. Banno 1984
Kockovaella Nakase, I. Banno & Y. Yamada 1991
Sterigmatosporidium G. Kraep. & U. Schulze 1983
= *Cuniculitrema* J.P. Samp. & R. Kirschner 2001
Family Naemateliaceae X. Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Dimennazyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Naematelia Fr. 1818
Family Phaeotremellaceae A.M. Yurkov & Boekhout 2015
Gelidatrema A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Phaeotremella Rea 1912
Family Phragmoxenidiaceae Oberw. & R. Bauer 1990
Phragmoxenidium Oberw. 1990
Family Rhynchogastremaceae Oberw. & B. Metzler 1989
Papiliotrema J.P. Samp., M. Weiss & R. Bauer 2002
Rhynchogastrema B. Metzler & Oberw. 1989
= *Bandoniozyma* Boekhout, P. Valente, Pagnocca, C.A. Rosa, C.F. Lee, S.O. Suh, M. Blackw., G. Péter & Fell 2012
Tetragoniomyces Oberw. & Bandoni 1981
Family Sirobasidiaceae Lindau 1897
Fibulobasidium Bandoni 1979
Family Tremellaceae Fr. 1821
Hormomyces Bonord. 1851
Mycocryptococcus Pollacci & Nann. 1927
Tremella Pers. 1794
= *Dermatangium* Velen. 1926
= *Encephalium* Link 1816
= *Epidochium* Fr. 1849
= *Gelatina* Raf. 1808
= *Gyraria* Nees 1816
= *Hepataria* Raf. 1808
= *Tremella* Dill. ex L. 1753
Family Trimorphomycetaceae X. Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Carlosrosaea A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Saitozyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Sugitazyma A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Trimorphomyces Bandoni & Oberw. 1983
Tremellales genera *incertae sedis*
Biatoropsis Räsänen 1934
Dictyotremella Kobayasi 1971
Neotremella Lowy 1979
Sigmogloea Bandoni & J.C. Krug 2000
Sirobasidium Lagerh. & Pat. 1892
Sirotrema Bandoni 1986
Tremellina Bandoni 1986
Xenolachne D.P. Rogers 1947
Order Trichosporonales Boekhout & Fell 2001
Family Tetragoniomycetaceae Oberw. & Bandoni 1981
Bandonia A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Cryptotrichosporon Okoli & Boekhout 2007
Takashimella Q.M. Wang 2015
Family Trichosporonaceae Nann. 1934
Apiotrichum Stautz 1931
Cutaneotrichosporon X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Effuseotrichosporon A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Haglerozyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015
Pascua Takashima, Manabe, Nishimura, Sriswasdi, Ohkuma, Iwasaki & Sugita 2019
Prillingera Takashima, Manabe, Nishimura, Sriswasdi, Ohkuma, Iwasaki & Sugita 2019
Trichosporon Behrend 1890
Vanrija R.T. Moore 1980
= *Asterotremella* Prillinger, Lopandić & Sugita 2007
Tremellomycetes genera *incertae sedis*
Heteromycophaga P. Roberts 1997
Phyllopta (Fr.) Fr. 1825
Trichosporonoides Haskins & J.F.T. Spencer 1967
Subphylum Pucciniomycotina R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Class Agaricostilbomycetes R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Order Agaricostilbales Oberw. & R. Bauer 1989
Family Agaricostilbaceae Oberw. & R. Bauer 1989

Agaricostilbum J.E. Wright 1970
= *Amerobotryum* Subram. & Natarajan 1976
Pseudobensingtonia F.Y. Bai, Q.M. Wang, M. Groenewald & Boekhout 2015
Sterigmatomyces Fell 1966

Family Chionosphaeraceae Oberw. & Bandoni 1982
Ballistosporomyces Nakase, G. Okada & Sugiy. 1989
Chionosphaera D.E. Cox 1976
= *Fibulostilbum* Seifert & Oberw. 1992
Cystobasidiopsis R. Bauer, B. Metzler, Begerow & Oberw. 2009
Kurtzmanomyces Y. Yamada, Itoh, H. Kawas., I. Banno & Nakase 1989
Stilbum Tode 1790

Family Kondoaceae R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Bensingtonia Ingold 1986
Kondoa Y. Yamada, Nakagawa & I. Banno 1989

Family Ruineniaceae Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Ruinenia Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015

Agaricostilbales genera *incertae sedis*
Jianyunia Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Mycogloea L.S. Olive 1950

Class Atractiellomycetes R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Order Atractiellales Oberw. & Bandoni 1982
Family Atractogloeaceae Oberw. & R. Bauer 1989
Atractogloea Oberw. & Bandoni 1982

Family Hoehnelomycetaceae Jülich 1982
Basidiopycnis Oberw., R. Kirschner, R. Bauer, Begerow & Arenal 2006
= *Basidiopycnides* J. Reid, Eyjólfsd. & Georg Hausner 2008
Proceropycnis M. Villarreal, Arenal, V. Rubio, Begerow, R. Bauer, R. Kirschner & Oberw. 2006

Family Phleogenaceae Gäum. 1926
Atractidochium Oono, Urbina & Aime 2018
Atractiella Sacc. 1886
= *Hoehnelomyces* Weese 1920
= *Pilacrella* J. Schröt. 1887
Bourdotigloea Aime 2018
Helicogloea Pat. 1892
= *Exobasidiellum* Donk 1931
= *Infundibura* Nag Raj & W.B. Kendr. 1981
= *Leucogloea* R. Kirschner 2004
= *Neogloea* Aime 2018
= *Saccoblastia* Möller 1895
Hobsonia Berk. ex Massee 1891
Phleogena Link 1833
= *Ecchyna* Fr. ex Boud. 1885
= *Martindalia* Sacc. & Ellis 1885
Saccosoma Spirin 2018

Class Classiculomycetes R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Order Classiculales R. Bauer, Begerow, Oberw. & Marvanová 2003
Family Classiculaceae R. Bauer, Begerow, Oberw. & Marvanová 2003
Classicula R. Bauer, Begerow, Oberw. & Marvanová 2003
Jaculispora H.J. Huds. & Ingold 1960

Class Cryptomycocolacomycetes R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Order Cryptomycocolacales Oberw. & R. Bauer 1990
Family Cryptomycocolacaceae Oberw. & R. Bauer 1990
Colacosiphon R. Kirschner, R. Bauer & Oberw. 2001
Cryptomycocolax Oberw. & R. Bauer 1990

Class Cystobasidiomycetes R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Order Buckleyzymales R.L. Zhao & K.D. Hyde 2017
Family Buckleyzymaceae Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Buckleyzyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015

Order Cystobasidiales R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Family Cystobasidiaceae Gäum. 1926
Cystobasidium (Lagerh.) Neuhoff 1924
Halobasidium Z. Guo, Y.R. Wang, Q.C. Hou, W.C. Li, H.J. Zhao, Z.H. Sun & Z.D. Zhang 2019
Occultifur Oberw. 1990

Order Erythrobasidiales R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Family Erythrobasidiaceae Denchev 2009
Bannoa Hamam. 2002
Erythrobasidium Hamam., Sugiy. & Komag. 1988

Erythrobasidiales genera *incertae sedis*
Cyphobasidium Millanes, Diederich & Wedin 2016
Cyrenella Goch. 1981
Hasegawazyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015

Order Naohideales R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Family Naohideaceae Denchev 2009
Naohidea Oberw. 1990
Order Sakaguchiales R.L. Zhao & K.D. Hyde 2017
Family Sakaguchiaceae Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2017
Sakaguchia Y. Yamada, K. Maeda & Mikata 1994
Cystobasidiomycetes families *incertae sedis*
Family Microsporomycetaceae Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Microsporomyces Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Family Symmetrosporaceae Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Symmetrospora Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Cystobasidiomycetes genera *incertae sedis*
Queiroziella C.R. Félix, J.D.P. Bezerra, R.P. Neves & Landell 2018
Class Microbotryomycetes R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Order Heterogastridiales Oberw. & R. Bauer 1990
Family Heterogastridiaceae Oberw. & R. Bauer 1990
Hyalopycnis Höhn. 1918
= *Heterogastridium* Oberw. & R. Bauer 1990
Krieglsteinera Pouzar 1987
Pycnopulvinus Toome & Aime 2014
Order Kriegeriales Toome & Aime 2013
Family Camptobasidiaceae R.T. Moore 1996
Camptobasidium Marvanová & Suberkr. 1990
= *Crucella* Marvanová & Suberkr. 1990
Glaciozyma Turchetti, Connell, Thomas-Hall & Boekhout 2011
Family Kriegeriaceae Toome & Aime 2013
Kriegeria Bres. 1891
= *Xenogloea* Syd. & P. Syd. 1919
= *Zymoxenogloea* D.J. McLaughlin & Doublés 1992
Meredithblackwellia Toome & Aime 2013
Phenoliferia Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Yamadamyces Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Order Leucosporidiales Sampaio, M. Weiss & Bauer 2003
Family Leucosporidiaceae Sampaio, M. Weiss & Bauer 2003
Leucosporidium Fell, Statzell, I.L. Hunter & Phaff 1970
= *Mastigobasidium* Golubev 1999
= *Leucosporidiella* Samp. 2003
Order Microbotryales R. Bauer & Oberw. 1997
Family Microbotryaceae R.T. Moore 1996
Bauerago Vánky 1999
Microbotryum Lév. 1847
= *Bauhinus* R.T. Moore 1992
= *Haradaea* Denchev 2006
= *Liroa* Cif. 1933
Sphacelotheca de Bary 1884
Zundeliomyces Vánky 1987
Family Ustilentylomataceae R. Bauer & Oberw. 1997
Aurantiosporium M. Piepenbr., Vánky & Oberw. 1996
Fulvisporium Vánky 1997
Microbotryozyma S.O. Suh, D.A. Maslov, Molestina & J.J. Zhou 2012
Ustilentyloma Savile 1964
Order Sporidiobolales Doweld 2001
Family Sporidiobolaceae R.T. Moore 1980
Rhodosporidiobolus Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Rhodotorula F.C. Harrison 1927
= *Chromotorula* F.C. Harrison 1927
= *Rhodosporidium* I. Banno 1967
Sporobolomyces Kluyver & C.B. Niel 1924
= *Amphiernia* Grüss 1927
= *Aessosporon* Van der Walt 1970
= *Blastoderma* B. Fisch. & Breback 1894
= *Prosporobolomyces* E.K. Novák & Zsolt 1961
= *Sporidiobolus* Nyland 1950
Microbotryomycetes families *incertae sedis*
Family Chrysozymaceae Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Bannozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Chrysozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Fellozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Hamamotoa Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Family Colacogloeaceae Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Colacogloea Oberw. & Bandoni 1991
Microbotryomycetes genera *incertae sedis*
Atractocolax R. Kirschner, R. Bauer & Oberw. 1999
Curvibasidium Samp. & Golubev 2004
Heitmania X.Z. Liu, F.Y. Bai, M. Groenew. & T. Boekhout 2018

Libkindia Mašínová, A. Pontes, J.P. Samp. & Baldrian 2017
Oberwinklerozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Pseudohyphozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Pseudoleucosporidium V. de Garcia, M.A. Coelho, T. Maia, L.H. Rosa, A.B.M. Vaz, C.A. Rosa, J.P. Samp., P. Gonç., M.R. Van Broock & Libkind 2015
Sampaiozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Slooffia Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Spencerozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Trigonosporomyces Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Udeniozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Vonarxula Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Yunzhangia Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Yurkovia Mašínová, A. Pontes, J.P. Samp. & Baldrian 2016

Class Mixiomycetes R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Order Mixiales R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Family Mixiaceae C.L. Kramer 1987
Mixia C.L. Kramer 1959
= *Phytoceratiomyxa* Sawada 1929

Class Pucciniomycetes R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Order Helicobasidiales R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Family Helicobasidiaceae P.M. Kirk 2008
Helicobasidium Pat. 1885
= *Helicobasis* Clem. & Shear 1931
= *Stypinella* J. Schröt. 1887
Tuberculina Tode ex Sacc. 1880
= *Cordalia* Gobi 1885
= *Uredinula* Speg. 1880

Order Pachnocybales R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Family Pachnocybaceae Oberw. & R. Bauer 1989
Pachnocybe Berk. 1836

Order Platygloeales R.T. Moore 1990
Family Eocronartiaceae Jülich 1982
Eocronartium G.F. Atk. 1902
= *Protopistillaria* Rick 1933
Herpobasidium Lind 1908
Jola Möller 1895
Platycarpa Couch 1949
Ptechetelium Oberw. & Bandoni 1984
Family Platygloeaceae Racib. 1909
Glomerogloea Doweld 2013
Glomopsis D.M. Hend. 1961
= *Glomerularia* Peck 1880
Insolibasidium Oberw. & Bandoni 1984
Platygloea J. Schröt. 1887
= *Collopezis* Clem. 1909
= *Tjibodasia* Holterm. 1898

Order Pucciniales Clem. & Shear 1931
Family Chaconiaceae Cummins & Y. Hirats. 1983
Achrotelium Syd. 1928
Aplopsora Mains 1921
Botryorhiza Whetzel & Olive 1917
Ceraceopsora Kakish., T. Sato & S. Sato 1984
Chaconia Juel 1897
= *Bitzea* Mains 1939
= *Desmotelium* Syd. 1937
Goplana Racib. 1900
Maravalia Arthur 1922
= *Acervulopsora* Thirum. 1945
= *Angusia* G.F. Laundon 1964
= *Argomycetella* Syd. 1922
= *Scopella* Mains 1939
= *Scopellopsis* T.S. Ramakr. & K. Ramakr. 1947
Olivea Arthur 1917
= *Tegillum* Mains 1940
Telomapea G.F. Laundon 1967
Family Coleosporiaceae Dietel 1900
Ceropsora B.K. Bakshi & Suj. Singh 1960
Chrysomyxa Unger 1840
= *Barclayella* Dietel 1890
= *Coleosporium* subgen. *Melampsoropsis* J. Schröt. 1879
= *Hiratsukaia* Hara 1948
= *Melampsoropsis* (J. Schröt.) Sacc. 1888
= *Melampsoropsis* (J. Schröt.) Arthur 1906
= *Stilbechrysomyxa* M.M. Chen 1984
Coleosporium Lév. 1847
= *Erannium* Bonord. 1860
= *Stichopsora* Dietel 1899 [1900]

= *Synomyces* Arthur 1924
Diaphanopellis P.E. Crane 2005
Gallowaya Arthur 1906

Family Cronartiaceae Dietel 1900
Cronartium Fr. 1815
Endocronartium Y. Hirats. 1969
Peridermium (Link) J.C. Schmidt & Kunze 1817

Family Melampsoraceae Dietel 1897
Melampsora Castagne 1843
= *Chnoopsora* Dietel 1906
= *Mesopsora* Dietel 1922
= *Necium* Arthur 1907
= *Podocystis* Fr. 1849
= *Podosporium* Lév. 1847

Family Mikronegeriaceae Cummins & Y. Hirats. 1983
Blastospora Dietel 1908
= *Pelastoma* M. Salazar, A.A. Carvalho & J.F. Hennen 2012
Chrysocelis Lagerh. & Dietel 1914
= *Stomatisora* J.M. Yen 1971
Mikronegeria Dietel 1899

Family Phakopsoraceae Cummins & Hirats. f. 1983
Aeciure Buriticá & J.F. Hennen 1994
Arthuria H.S. Jacks. 1931
Cerotelium Arthur 1906
= *Catenulopsora* Mundk. 1943
Crossopsora Syd. & P. Syd. 1919
Dasturella Mundk. & Khesw. 1943
Kweilingia Teng 1940
= *Tunicopsora* Suj. Singh & P.C. Pandey 1971
Macabuna Buriticá & J.F. Hennen 1994
Monosporidium Barclay 1888
= *Kulkarniella* Gokhale & Patel 1952 [1951]
Newinia Thaung 1973
Nothoravenelia Dietel 1910
Phakopsora Dietel 1895
= *Angiopsora* Mains 1934
= *Bubakia* Arthur 1906
= *Batistopsora* Dianese, R.B. Medeiros & L.T.P. Santos 1993
= *Malupa* Y. Ono, Buriticá & J.F. Hennen 1992
= *Physopella* Arthur 1906
= *Stakmania* Kamat & Sathe 1968
= *Uredostilbe* Buriticá & J.F. Hennen 1994
= *Uredendo* Buriticá & J.F. Hennen 1994 [nom. inval.]
Phragmidiella Henn. 1905
= *Santapauella* Mundk. & Thirum. 1945
Pucciniostele Tranzschel & K.L. Kom. 1899
= *Klastopsora* Dietel 1904
= *Phragmostele* Clem. 1909
Scalarispora Buriticá & J.F. Hennen 1994
Uredopeltis Henn. 1908

Family Phragmidiaceae Corda 1837
Arthuriomyces Cummins & Y. Hirats. 1983
Campanulospora Salazar-Yepes, Pardo-Card. & Buriticá 2007
Gerwasia Racib. 1909
= *Mainsia* H.S. Jacks. 1931
Gymnoconia Lagerh. 1894
= *Kunkelia* Arthur 1917
Hamaspora Körn. 1877
= *Hamasporella* Höhn. 1912
Joerstadia Gjaerum & Cummins 1982
Kuehneola Magnus 1898
= *Spirechina* Arthur 1907
Morispora Salazar-Yepes, Pardo-Card. & Buriticá 2007
Phragmidium Link 1816
= *Ameris* Arthur 1906
= *Aregma* Fr. 1815
= *Earlea* Arthur 1906
= *Epitea* Fr. 1832
= *Frommea* Arthur 1917
= *Frommeëlla* Cummins & Y. Hirats. 1983
= *Lecythea* Lév. 1847
= *Phragmidium* A *Phragmidiopsis* G. Winter 1881 [1884]
= *Phragmidiopsis* (G. Winter) Mussat 1901
= *Teloconia* Syd. 1921
= *Trolliomyces* Ulbr. 1938
Physonema Lév. 1847
Scutelliformis Salazar-Yepes, Pardo-Card. & Buriticá 2007
Trachyspora Fuckel 1861
= *Trachysporella* Syd. 1921
Xenodochus Schltdl. 1826

Family Pileolariaceae Cummins & Y. Hirats. 1983
Atelocauda Arthur & Cummins 1933
Pileolaria Castagne 1842
= *Discospora* Arthur 1907
Skierka Racib. 1900
= *Ctenoderma* Syd. & P. Syd. 1919
Uromycladium McAlpine 1905
= *Macalpinia* Arthur 1906

Family Pucciniaceae Chevall. 1826
Allodus Arthur 1906
Chrysella Syd. 1926
Chrysocyclus Syd. 1925
= *Holwayella* H.S. Jacks. 1926
Chrysopsora Lagerh. 1892
Cleptomyces Arthur 1918
Coleopucciniella Hara ex Hirats. 1937
= *Coleopucciniella* Hara 1936
Corbulopsora Cummins 1940
Cumminsiella Arthur 1933

Cystopsora E.J. Butler 1910
Endophyllum Lév. 1826
Gymnosporangium R. Hedw. ex DC. 1805
= *Ceratitium* Rabenh. 1851
= *Ceratitium* Ces. 1879
= *Ciglides* Chevall. 1826
= *Gymnotelium* Syd. 1921
= *Podisoma* Link 1809
Kernella Thirum. 1949
= *Kernia* Thirum. 1946
Miyagia Miyabe ex Syd. & P. Syd. 1913
= *Peristemma* Syd. 1921
Polioma Arthur 1907
Puccinia Pers. 1794
= *Argomyces* Arthur 1912
= *Argotelium* Arthur 1906
= *Bullaria* DC. 1805
= *Coronotelium* Syd. 1921
= *Cutomyces* Thüm. 1878
= *Dicaeoma* Gray 1821
= *Eriosporangium* Bertero ex Ruschenb. 1831
= *Jackya* Bubák 1902
= *Leptinia* Juel 1897
= *Leptopuccinia* (G. Winter) Rostr. 1902
= *Lindrothia* Syd. 1922
= *Linkiella* Syd. 1921
= *Lysospora* Arthur 1906
= *Micropuccinia* Rostr. 1902
= *Persooniella* Syd. 1922
= *Pleomeris* Syd. 1921
= *Poliomella* Syd. 1922
= *Puccinia* subgen. *Leptopuccinia* G. Winter 1881 [1884]
= *Puccinidia* Mayr 1890
= *Rostrupia* Lagerh. 1889
= *Schroeterella* Syd. 1922
= *Sclerotelium* Syd. 1921
= *Solenodonta* Castagne 1845
= *Trailia* Syd. 1922
Ramakrishnania Ramachar & Bhagyan. 1979
Roestelia Rebent. 1804
= *Cancellaria* Brongn. 1825
= *Centridium* Chevall. 1826
Stereostratum Magnus 1899
Uromyces (Link) Unger 1833
= *Alveomyces* Bubák 1914
= *Capitularia* Rabenh. 1851
= *Coeomurus* Gray 1821
= *Dichlamys* Syd. & P. Syd. 1920 [1919]
= *Groveola* Syd. 1921
= *Haplopyxis* Syd. & P. Syd. 1920 [1919]
= *Haplotelium* Syd. 1922
= *Hypodermium* subgen. *Uromyces* Link 1816 [1815]
= *Klebahnia* Arthur 1906
= *Nielsenia* Syd. 1921
= *Ontotelium* Syd. 1921
= *Poliotelium* Syd. 1922
= *Puccinella* Fuckel 1860
= *Pucciniola* L. Marchand 1829
= *Teleutospora* Arthur & Bisby 1921
= *Telospora* Arthur 1906
= *Trochodium* Syd. & P. Syd. 1920 [1919]
= *Uromycopsis* Arthur 1906
Xenostele Syd. & P. Syd. 1921
Zaghouania Pat. 1901

Family Pucciniastraceae Gäum. ex Leppik 1972
Hyalopsora Magnus 1902
Melampsorella J. Schröt. 1874
Melampsoridium Kleb. 1899
Milesia F.B. White 1878
Milesina Magnus 1909
Naohidemyces S. Sato, Katsuya & Y. Hirats. 1993
Peridiopsora Kamat & Sathe 1969
Pucciniastrum G.H. Otth 1861
= *Calyptospora* J.G. Kühn 1869
= *Phragmopsora* Magnus 1875
= *Pomatomyces* Oerst. 1864
Thekopsora Magnus 1875
Uredinopsis Magnus 1893

Family Pucciniosiraceae Cummins & Y. Hirats. 1983
Alveolaria Lagerh. 1892
Baeodromus Arthur 1905
Ceratocoma Buriticá & J.F. Hennen 1991
Chardoniella F. Kern 1939
Cionothrix Arthur 1907
Didymopsora Dietel 1899
Dietelia Henn. 1897
= *Endophylloides* Whetzel & Olive 1917
= *Jacksonia* J.C. Lindq. 1970
= *Jacksoniella* J.C. Lindq. 1972
= *Jacksoniella* Kamat & Sathe 1972
= *Thirumalachariella* Sathe 1975 [1974]
Gambleola Massee 1898
Pucciniosira Lagerh. 1892
= *Aecidiella* Ellis & Kelsey 1897
= *Didymosira* Clem. 1909
= *Schizospora* Dietel 1895
Trichopsora Lagerh. 1892

Family Raveneliaceae Leppik 1972
Allotelium Syd. 1939
Anthomyces Dietel 1899
Anthomycetella Syd. & P. Syd. 1916
= *Reyesiella* Sacc. 1917
Apra J.F. Hennen & F.O. Freire 1979

Bibulocystis J. Walker, Beilharz, Pascoe & Priest 2006
Cumminsina Petr. 1955
Cystomyces Syd. 1926
Diabole Arthur 1922
Diabolidium Berndt 1995
Dicheirinia Arthur 1907
Diorchidiella J.C. Lindq. 1957
Diorchidium Kalchbr. 1882
= *Diphragmium* Boedijn (1960) [1959]
Endoraecium Hodges & D.E. Gardner 1984
= *Racospermyces* J. Walker 2001
Esalque J.F. Hennen, Figueiredo & A.A. Carvalho 2000
Hapalophragmium Syd. & P. Syd. 1901
= *Hapalophragmiopsis* Thirum. 1950
= *Triactella* Syd. 1921
Kernkampella Rajendren 1970
Lipocystis Cummins 1937
Nyssopsora Arthur 1906
= *Oplophora* Syd. 1921
Ravenelia Berk. 1853
= *Cephalotelium* Syd. 1921
= *Cystingophora* Arthur 1907
= *Cystotelium* Syd. 1921
= *Dendroecia* Arthur 1906
= *Haploravenelia* Syd. 1921
= *Longia* Syd. 1921
= *Neoravenelia* Long 1903
= *Pleoravenelia* Long 1903
Sphenospora Dietel 1892
Spumula Mains 1935
Triphragmiopsis Naumov 1914
= *Nyssopsorella* Syd. 1921
Triphragmium Link 1825
Ypsilospora Cummins 1941

Family Sphaerophragmiaceae Cummins & Y. Hirats. 1983
Austropuccinia Beenken 2017
Sphaerophragmium Magnus 1891

Family Uncolaceae Buriticá 2000
Calidion Syd. & P. Syd. 1919
Uncol Buriticá & P.A. Rodr. 2000

Family Uropyxidaceae (P. Syd. & Syd.) Cummins & Y. Hirats. 1983
Canasta A.A. Carvalho & J.F. Hennen 2010
Dasyspora Berk. & M.A. Curtis 1854
= *Sartvellia* Berk. 1857
Didymopsorella Thirum. 1950
= *Gymnopuccinia* K. Ramakr. 1951
Dipyxis Cummins & J.W. Baxter 1967
Kimuromyces Dianese, L.T.P. Santos, R.B. Medeiros & Furlan. 1995
Leucotelium Tranzschel 1935
Macruropyxis Azbukina 1972
Mimema H.S. Jacks. 1931
Ochropsora Dietel 1895
Phragmopyxis Dietel 1897
= *Tricella* Long 1912
Poliomopsis A.W. Ramaley 1987
Porotenus Viégas 1960
Prospodium Arthur 1907
= *Coinostelium* Syd. 1939
= *Nephlyctis* Arthur 1907
Sorataea Syd. 1930
= *Allopuccinia* H.S. Jacks. 1931
Tranzschelia Arthur 1906
= *Polythelis* Arthur 1906
= *Lipospora* Arthur 1942
Uropyxis J. Schröt. 1875
= *Calliospora* Arthur 1905

Pucciniales genera *incertae sedis*
Aecidiconium Vuill. 1892
Aecidiolum Unger 1833
Aecidium Pers. 1796
= *Sphaerotheca* Desv. 1817
= *Symperidium* Klotzsch 1843
Caeoma Link 1809
= *Hypodermium* Link 1815
Caetea Salazar-Yepes & A.A. Carvalho 2012
Cerradoa J.F. Hennen & Y. Ono 1978
Coleopuccinia Pat. 1889
= *Coleoma* Clem. 1909
Desmella Syd. & P. Syd. 1919 [1918]
Desmellopsis J.M. Yen 1969
Desmosorus Ritschel, Oberw. & Berndt 2005
Edythea H.S. Jacks. 1931
Elateraecium Thirum., F. Kern & B.V. Patil 1966
= *Hiratsukamyces* Thirum., F. Kern & B.V. Patil 1975
Flaminia Sacc. & P. Syd. 1902
Hemileia Berk. & Broome 1869
= *Hemileiopsis* Racib. 1900
= *Wardia* J.F. Hennen & M.M. Hennen 2003
Hennenia Buriticá 1995
Intrapes J.F. Hennen & Figueiredo 1979
Masseeëlla Dietel 1895
= *Kamatomyces* Sathe 1966
Mehtamyces Mundk. & Thirum. 1945
Phragmotelium Syd. 1921
Puccorchidium Beenken 2015
Schroeteriaster Magnus 1896
= *Uromycodes* Clem. 1909
Sphenorchidium Beenken 2015
Uraecium Arthur 1933
Uredo Pers. 1801

= *Mapea* Pat. 1906
= *Nigredo* (Pers.) Roussel 1806
= *Peridipes* Buriticá & J.F. Hennen 1994
= *Rubigo* (Pers.) Roussel 1806
= *Trichobasis* Lév., in Orbigny 1849
= *Uredo* Pers. 1801

Order Septobasidiales Couch ex Donk 1964
Family Septobasidiaceae Racib. 1909
Aphelariopsis Jülich 1982
Auriculoscypha D.A. Reid & Manim. 1985
Coccidiodictyon Oberw. 1989
Johncouchia S. Hughes & Cavalc. 1983
Septobasidium Pat. 1892
= *Ordonia* Racib. 1909
= *Campylobasidium* Lagerh. ex F. Ludw. 1892
= *Glenospora* Berk. & Desm. 1849
= *Mohortia* Racib. 1909
= *Rudetum* Lloyd 1919
Uredinella Couch 1937

Class Spiculogloeomycetes Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Order Spiculogloeales R. Bauer, Begerow, J.P. Samp., M. Weiss & Oberw. 2006
Family Spiculogloeaceae Denchev 2009
Phyllozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015
Spiculogloea P. Roberts 1996

Class Tritirachiomycetes Aime & Schell 2011
Order Tritirachiales Aime & Schell 2011
Family Tritirachiaceae Aime & Schell 2011
Tritirachium Limber 1940
= *Spirotrichum* Saito ex J.F.H. Beyma 1940
Paratritirachium Beguin, Pyck & Detandt 2012

Pucciniomycotina genera *incertae sedis*
Kryptastrina Oberw. 1990
Paraphelaria Corner 1966
Zygogloea P. Roberts 1994

Subphylum Ustilaginomycotina Doweld 2001
Class Exobasidiomycetes Begerow, M. Stoll & R. Bauer 2007
Order Ceraceosorales Begerow, M. Stoll & R. Bauer 2007
Family Ceraceosoraceae Denchev & R.T. Moore 2009
Ceraceosorus B.K. Bakshi 1976

Order Doassansiales R. Bauer & Oberw. 1997
Family Doassansiaceae R.T. Moore ex P.M. Kirk, P.F. Cannon & J.C. David 2001
Burrillia Setch. 1891
= *Stereosorus* Sawada 1943
Doassansia Cornu 1883
= *Setchellia* Magnus 1896
Doassinga Vánky, R. Bauer & Begerow 1998
Entylomaster Vánky & R.G. Shivas 2006
Heterodoassansia Vánky 1993
Nannfeldtiomyces Vánky 1981
Narasimhania Thirum. & Pavgi 1952
Pseudodermatosorus Vánky 1999
Pseudodoassansia (Setch.) Vánky 1981
Pseudotracya Vánky 1999
Tracya Syd. & P. Syd. 1901
= *Cornuella* Setch. 1891
= *Tracyella* Zambett. 1970
Family Melaniellaceae R. Bauer, Vánky, Begerow & Oberw. 1999
Melaniella R. Bauer, Vánky, Begerow & Oberw. 1999
Family Rhamphosporaceae R. Bauer & Oberw. 1997
Rhamphospora D.D. Cunn. 1888

Order Entylomatales R. Bauer & Oberw. 1997
Family Entylomataceae R. Bauer & Oberw. 1997
Entyloma de Bary 1874
Tilletiopsis Derx 1948

Order Exobasidiales Henn. 1898
Family Brachybasidiaceae Gäum. 1926
Brachybasidium Gäum. 1922
Dicellomyces L.S. Olive 1945
Kordyana Racib. 1900
= *Lelum* Racib. 1900
Meira Boekhout, Scorzetti, Gerson & Sztejnb. 2003
Proliferobasidium J.L. Cunn. 1976
Family Cryptobasidiaceae Malençon ex Donk 1956
Acaromyces Boekhout, Scorzetti, Gerson & Sztejnb. 2003
Botryoconis Syd. & P.Syd. 1906
= *Cryptobasidium* Lendn. 1921
Clinoconidium Pat. 1898
Coniodictyum Har. & Pat. 1909
= *Hyalodema* Magnus 1910
Drepanoconis J. Schröt. & Henn. 1896
Phacellula Syd. 1927
Family Exobasidiaceae J. Schröt. 1888
Arcticomyces Savile 1959
Austrobasidium Palfner 2006
Exobasidium Woronin 1867
Muribasidiospora Kamat & Rajendren 1968
Family Graphiolaceae Clem. & Shear 1931
Graphiola Poit. 1824
= *Dacryodochium* P. Karst. 1896
= *Elpidophora* Ehrenb. ex Link 1824
= *Trichodesmium* Chevall. 1826
Stylina Syd. & P. Syd. 1921

Family Laurobasidiaceae Pinruan, Sommai, Suetrong, Somrith. & E.B.G. Jones 2018
Laurobasidium Jülich 1982
Order Georgefischeriales R. Bauer, Begerow & Oberw. 1997
Family Eballistraceae R. Bauer, Begerow, A. Nagler & Oberw. 2001
Eballistra R. Bauer, Begerow, A. Nagler & Oberw. 2001
Family Georgefischeriaceae R. Bauer, Begerow & Oberw. 1997
Georgefischeria Thirum. & Naras. 1963
Jamesdicksonia Thirum., Pavgi & Payak 1961
Family Gjaerumiaceae R. Bauer, M. Lutz & Oberw. 2005
Gjaerumia R. Bauer, M. Lutz & Oberw. 2005
Family Tilletiariaceae R.T. Moore 1980
Phragmotaenium R. Bauer, Begerow, A. Nagler & Oberw. 2001
Tilletiaria Bandoni & B.N. Johri 1972
Tolyposporella G.F. Atk. 1897
Order Golubeviales Q.M. Wang, Begerow, F.Y. Bai & Boekhout 2015
Family Golubeviaceae Q.M. Wang, F.Y. Bai, Begerow & Boekhout 2015
Golubevia Q.M. Wang, F.Y. Bai, Begerow & Boekhout 2015
Order Microstromatales R. Bauer & Oberw. 1997
Family Microstromataceae Jülich 1982
Microstroma Niessl 1861
= *Helostroma* Pat. 1902
= *Leptophyma* Sacc. 1889
Family Quambalariaceae Z.W. de Beer, Begerow & R. Bauer 2006
Quambalaria J.A. Simpson 2000
Family Volvocisporiaceae Begerow, R. Bauer & Oberw. 2001
Volvocisporium Begerow, R. Bauer & Oberw. 2001
Microstromatales genera *incertae sedis*
Jaminaea Sipiczki & Kajdacsi ex T. Kij. & Aime 2017
Parajaminaea T. Kij. & Aime 2017
Pseudomicrostroma T. Kij. & Aime 2017
Sympodiomycopsis Sugiy., Tokuoka & Komag. 1991
Order Robbauerales Boekhout, Begerow, Q.M. Wang & F.Y. Bai 2015
Family Robbaueraceae Boekhout, Begerow, Q.M. Wang & F.Y. Bai 2015
Robbauera Boekhout, Begerow, Q.M. Wang & F.Y. Bai 2015
Order Tilletiales Kreisel ex R. Bauer & Oberw. 1997
Family Erratomycetaceae Denchev & T. Denchev 2013
Erratomyces M. Piepenbr. & R. Bauer 1997
Family Tilletiaceae J. Schröt. 1887
Conidiosporomyces Vánky 1992
Ingoldiomyces Vánky 1996
Neovossia Körn. 1879
= *Vossia* Thüm. 1879
Oberwinkleria Vánky & R. Bauer 1995
Salmacisia D.R. Huff & A. Chandra 2008
Tilletia Tul. & C. Tul. 1847
Class Malasseziomycetes Q.M. Wang & F.Y. Bai 2014
Order Malasseziales R.T. Moore 1980
Family Malasseziaceae Denchev & R.T. Moore 1980
Malassezia Baillon 1889
= *Pityrosporum* Sabour. 1904
Class Moniliellomycetes Q.M. Wang, F.Y. Bai & Boekhout 2014
Order Moniliellales Q.M. Wang, F.Y. Bai & Boekhout
Family Moniliellaceae Q.M. Wang, F.Y. Bai & Boekhout
Moniliella Stolk & Dakin 1966
Class Ustilaginomycetes R. Bauer, Oberw. & Vánky 1997
Uleiellales Garnica, K. Riess, M. Schön, H. Butin, M. Lutz, Oberw. & R. Bauer 2016
Family Uleiellaceae Vánky 2001
Uleiella J. Schröt. 1894
= *Ulea* J. Schröt. 1892
Order Urocystidales R. Bauer & Oberw. 1997
Family Doassansiopsidaceae Begerow, R. Bauer & Oberw. 1998
Doassansiopsis (Setch.) Dietel 1897
Family Fereydouniaceae S. Nasr, Soudi, H.D.T. Nguyen, M. Lutz & Piątek 2014
Fereydounia S. Nasr, M.R. Soudi, H.D.T. Nguyen, M. Lutz & Piątek 2014
Family Floromycetaceae S. Nasr, Soudi, H.D.T. Nguyen, M. Lutz & Piątek 2014
Antherospora R. Bauer, M. Lutz, Begerow, Piątek & Vánky 2008
Floromyces Vánky, M. Lutz & R. Bauer 2008
Family Glomosporiaceae Cif. 1963
Thecaphora Fingerh. 1836
= *Angiosorus* Thirum. & M.J. O'Brien 1974
= *Poikilosporium* Dietel 1897
= *Sorosporium* F. Rudolphi 1829
= *Thecaphorella* H. Scholz & I. Scholz 1988

= *Tothiella* Vánky 1999
Family Mycosyringaceae R. Bauer & Oberw. 1997
Mycosyrinx Beck 1894
Family Urocystidaceae Begerow, R. Bauer & Oberw. 1998
Flamingomyces R. Bauer, M. Lutz, Piątek, Vánky & Oberw. 2007
Melanoxa M. Lutz, Vánky & R. Bauer 2013
Melanustilospora Denchev 2003
Mundkurella Thirum. 1944
Urocystis Rabenh. ex Fuckel 1870
= *Ginanniella* Cif. 1938
= *Polycystis* Lév. 1846
= *Polysaccopsis* Henn. 1898
= *Tuburcinia* Fr. 1832
= *Tuburcinia* Woronin 1882
= *Tuburciniella* Zambett. 1970
Ustacystis Zundel 1945
= *Whetzelia* Zundel 1945
Vankya Ershad 2000
Order Ustilaginales G. Winter 1880
Family Anthracoideaceae Denchev 1997
Anthracoidea Bref. 1895
= *Cintractiomyxa* Golovin 1952
Cintractia Cornu 1883
Dermatosorus Sawada ex L. Ling 1949
= *Zundelula* Thirum. & Naras. 1952
Farysia Racib. 1909
= *Elateromyces* Bubák 1912
Farysporium Vánky 1999
Heterotolyposporium Vánky 1997
Kuntzeomyces Henn. ex Sacc. & P. Syd. 1899
= *Didymochlamys* Henn. 1897
= *Perichlamys* Clem. & Shear 1931
Leucocintractia M. Piepenbr., Begerow & Oberw. 1999
Moreaua Liou & H.C. Cheng 1949
Orphanomyces Savile 1974
Pilocintractia Vánky 2004
Planetella Savile 1951
Portalia V. González, Vánky & Platas 2007
Schizonella J. Schröt. 1877
Stegocintractia M. Piepenbr., Begerow & Oberw. 1999
Testicularia Klotzsch 1832
Tolyposporium Woronin ex J. Schröt. 1887
Trichocintractia M. Piepenbr. 1995
Ustanciosporium Vánky 1999
= *Gymnocintractia* M. Piepenbr., Begerow & Oberw. 1999
Family Cintractiellaceae Vánky 2003
Cintractiella Boedijn 1937
Family Clintamraceae Vánky 2001
Clintamra Cordas & Durán 1977
Family Geminaginaceae Vánky 2001
Geminago Vánky & R. Bauer 1996
Family Melanotaeniaceae Begerow, R. Bauer & Oberw. 1998
Exoteliospora R. Bauer, Oberw. & Vánky 1999
Melanotaenium de Bary 1874
Yelsemia J. Walker 2001
Family Pericladiaceae Vánky 2011
Pericladium Pass. 1875
= *Xylosorium* Zundel 1939
Family Ustilaginaceae Tul. & C. Tul. 1847
Ahmadiago Vánky 2004
Aizoago Vánky 2013
Anomalomyces Vánky, M. Lutz & R.G. Shivas 2006
Anthracocystis Bref. 1912
Bambusiomyces Vánky 2011
Centrolepidosporium R.G. Shivas & Vánky 2007
Dirkmeia F.Y. Bai, Q.M. Wang, Begerow & Boekhout 2015
Eriocaulago Vánky 2005
Eriomoeszia Vánky 2005
Eriosporium Vánky 2005
Franzpetrakia Thirum. & Pavgi 1957
Kalmanozyma Q.M. Wang, F.Y. Bai, Begerow & Boekhout 2015
Langdonia McTaggart & R.G. Shivas 2012
Macalpinomyces Langdon & Full. 1977
= *Endosporisorium* Vánky 1995
Melanopsichium Beck 1894
Moesziomyces Vánky 1977
= *Tolyposporidium* Thirum. & Neerg. 1978
Mycosarcoma Bref. 1912
Parvulago R. Bauer, M. Lutz, Piątek, Vánky & Oberw. 2007
Pattersoniomyces Piątek, M. Lutz & C.A. Rosa 2017
Pseudozyma Bandoni 1985
Shivasia Vánky, M. Lutz & Piątek 2012
Sporisorium Ehrenb. ex Link 1825
= *Endothlaspis* Sorokīn 1884
Stollia McTaggart & R.G. Shivas 2012
Tranzscheliella Lavrov 1936
Triodiomyces McTaggart & R.G. Shivas 2012
Ustilago (Pers.) Roussel 1806
= *Crozalsiella* Maire 1917
= *Farinaria* Sowerby 1803
= *Pericoelium* Bonord. 1851
= *Tubisorus* Vánky & M. Lutz 2011
= *Ustilagidium* Herzberg 1895
= *Yenia* Liou 1949
Yunchangia L. Guo & B. Xu 2013

Family Websdaneaceae Vánky 2001
Restiosporium Vánky 2000
Websdanea Vánky 1997
Order Violaceomycetales Albu, Toome & Aime 2015
Family Violaceomycetaceae Albu, Toome & Aime 2015
Violaceomyces Albu, Toome & Aime 2015
Ustilaginomycetes genera *incertae sedis*
Capitulocladosporium L.Y. Sun, X. Sun & L.D. Guo 2017
Eriocortex Vánky & R.G. Shivas 2013
Subphylum Wallemiomycotina Doweld 2014
Class Wallemiomycetes Zalar, de Hoog & Schroers 2005
Order Geminibasidiales H.D.T. Nguyen, N.L. Nick. & Seifert 2013
Family Geminibasidiaceae H.D.T. Nguyen, N.L. Nick. & Seifert 2013
Basidioascus Matsush. 2003
Geminibasidium H.D.T. Nguyen, N.L. Nick. & Seifert 2013
Order Wallemiales Zalar, de Hoog & Schroers 2005
Family Wallemiaceae R.T. Moore 1996
Wallemia Johan-Olsen 1887
= *Bargellinia* Borzí 1888
= *Hemispora* Vuill. 1906
Wallemiomycetes genus *incertae sedis*
Chernovia A.M. Yurkov & Begerow 2016
Basidiomycota genera *incertae sedis*
Anastomyces W.P. Wu, B. Sutton & Gange 1997
Anguillomyces Marvanová & Bärl. 2000
Arcispora Marvanová & Bärl. 1998
Arrasia Bernicchia, Gorjón & Nakasone 2011
Bartheletia G. Arnaud ex Scheuer, R. Bauer, M. Lutz, Stabenth., Melnik & Grube 2008
= *Bartheletia* G. Arnaud 1954
Brevicellopsis Hjortstam & Ryvarden 2008
Celatogloea P. Roberts 2005
Cystogloea P. Roberts 2006
Microstella K. Ando & Tubaki 1984
Neotyphula Wakef. 1934
Radulodontia Hjortstam & Ryvarden 2008
Restilago Vánky 2008

Notes of genera in Basidiomycota

Abortiporus Murrill 1904, Podoscyphaceae, Polyporales, Agaricomycetes, asexual morph *Sporotrichopsis* Stalpers 2000, four species, type species *A. distortus* (Schwein.) Murrill (current name: *A. biennis* (Bull.) Singer), basidioma pileate-stipitate, hymenophore poroid to daedaleoid, terrestrial or wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Justo et al. 2017 (phylogeny, Polyporales), new sp. see Læssøe and Ryvarden 2010a (morphology, Ecuador).
Abrachium Baseia & T.S. Cabral 2012, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *A. floriforme* (Baseia & Calonge) Baseia & T.S. Cabral, saprobic, terrestrial, Brazil, sequence data available, see Cabral et al. 2012 (monograph).
Abstoma G. Cunn. 1926, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, eight species, type species *A. purpureum* (Lloyd) G. Cunn., terrestrial, saprobic, worldwide, see Moreno et al. 2007 (new combination of *A. stuckertii*), see Kirk et al. 2013 (genus accepted), sequence data available, see Bidartondo et al. 2009 (taxonomy).
Abundisporus Ryvarden 1999, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, eight species, type species *A. fuscopurpureus* (Pers.) Ryvarden, basidioma resupinate to pileate, hymenophore poroid, wood-rotting, white rot, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Robledo et al. 2009 (phylogeny), Li and Cui 2013b (phylogeny), Zhao et al. 2013b (morphology, China), Jargalmaa et al. 2015 (Korea), Jang et al. 2016 (polyporoid fungi, corticioid fungi, Korea), new sp. see Zhao et al. 2015b (phylogeny, monograph, China).
Acanthobasidium Oberw. 1965, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, six species, type species *A. delicatus* (Wakef.) Oberw. ex Jülich, wood-rotting, Europe, genus accepted, see Kirk et al. 2013, sequence data available, new spp. and new combination see Dai and He 2017 (phylogeny, *Aleurodiscus* s.l., China).
Acanthocorticium Baltazar, Gorjón & Rajchenb. 2015, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *A. brueggemannii* Baltazar, Gorjón & Rajchenb., South Brazil, basidioma resupinate, adnate, cartilaginous, hymenophore smooth to poroid, sequence data available, see Baltazar et al. 2015 (phylogeny, Brazil).
Acanthofungus Sheng H. Wu, Boidin & C.Y. Chien 2000, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, six species, type species *A. rimosus* Sheng H. Wu, Boidin & C.Y. Chien, saprobes, worldwide, see Wu et al. 2000 (taxonomy), sequence data available, see Wu et al. 2001 (phylogeny).
Acantholichen P.M. Jørg. 1998, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *A. pannarioides* P.M. Jørg., lichenized, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Dal-Forno et al. 2016 (South and Central America).

Acanthophysellum Parmasto 1967, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, 14 species, type species *A. lividocoeruleum* (P. Karst.) Parmasto, wood-rotting, worldwide, genus accepted, see Kirk et al. 2013, sequence data available, see Dai and He 2017 (phylogeny, *Aleurodiscus s. l.*).

Acanthophysium (Pilát) G. Cunn. 1963, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, c. 20 species, worldwide, crust fungus, see Kirk et al. 2013 (genus accepted), sequence data available, see Vu et al. 2019 (DNA sequences).

Acaromyces Boekhout, Scorzetti, Gerson & Sztejnberg 2003, Cryptobasidiaceae, Exobasidiales, Exobasidiomycetes, one species, known only from saprobic yeast states, anamorphic genus, plant material, Israel, Japan, Vietnam, see Kurtzman et al. 2011 (taxonomy), cultures available, sequence data available, see Begerow et al. 2014 (taxonomy), Wang et al. 2015c (phylogeny).

Achrotelium Syd. 1928, Chaconiaceae, Pucciniales, Pucciniomycetes, five species, type species *A. ichnocarpi* Syd., biotrophic on Apocynaceae, Sapotaceae, Urticaceae, terrestrial, Africa, Cuba, Philippines, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Acinophora Raf. 1808, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *A. aurantiaca* Raf., sequence data unavailable, see Kirk et al. 2008.

Acladium Link 1809, Botryobasidiaceae, Cantharellales, Agaricomycetes, sexual morph unknown, 20 species, type species *A. conspersum* Link, polyphyletic across orders, in need of modern interpretation, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Actiniceps Berk. & Broome 1876, Pterulaceae, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *A. thwaitesii* Berk. & Broome, saprobes, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Dentinger and McLaughlin 2006 (phylogeny).

Acutocapillitium P. Ponce de León 1976, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *A. torrendii* (Lloyd) P. Ponce de León, tropical America, Spain, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Aecidiconium Vuill. 1892, *incertae sedis*, Pucciniales, Pucciniomycetes, one species, type species *A. bartetii* Vuill., France, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Adustoporia Audet 2017, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *A. sinuosa* (Fr.) Audet, basidioma resupinate, sequence data available, see Ortiz-Santana et al. 2013 (antrodia clade of Polyporales, phylogeny), Spirin et al. 2015d (phylogeny, *Antrodia s. s.*), Audet 2017d (new combination).

Aecidiolum Unger 1833, *incertae sedis*, Pucciniales, Pucciniomycetes, twelve species, type species *A. exanthematicum* Unger, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Aecidium Pers. 1796 (= *Sphaerotheca* Desv. 1817; = *Symperidium* Klotzsch 1843), *incertae sedis*, Pucciniales, Pucciniomycetes, asexual morph particularly of *Puccinia*, *Tranzschelia*, *Uromyces*, c. 800 species, type species *A. berberidis* Pers., biotrophic on many plant families, terrestrial, worldwide, see Azbukina and Gjærum 2008 (new variety, nom. inval.), Hernández and Cline 2010 (new name), Hernández and Cline 2010 (replaced *Aecidium dioscoreae* J.C. Lindq., nom. illeg. with *Aecidium tumbayensis*), Jage et al. 2010 (new variety, nom. inval.), Kirk et al. 2013 (genus accepted), sequence data available, see Van Der Merwe et al. 2008 (coevolution, *Puccinia*/*Uromyces*), Morin et al. 2009 (species hybrid of *Puccinia lagenophorae*, phylogeny), Padamsee and McKenzie 2017 (phylogeny, New Zealand), new spp. see Kavale and Patil 2008, Sultan et al. 2008, Walker and van der Merwe 2009, Mohanan 2010, Berndt 2013a (account of rust fungi in French Guiana), Beenken 2014, Duarte et al. 2016.

Aeciure Buriticá & J.F. Hennen 1994, Phakopsoraceae, Pucciniales, Pucciniomycetes, one species, type species *A. crotonis* (Henn.) Buriticá & J.F. Hennen, biotrophic on Euphorbiaceae, terrestrial, Brazil, see Cummins and Hiratsuka 2003 (synonym of *Caeoma*), new spp. see Yepes and Céspedes 2008 (*Aeciure ancizari* = *Puccinia ancizari* Mayor), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Aegeritopsis Höhn. 1903, *incertae sedis*, Polyporales, Agaricomycetes, sexual morph unknown, one species, type species *A. nulliporoides* Höhn, wood-rotting, sequence data unavailable, see Kirk et al. 2008.

Aegis Gómez-Montoya, Rajchenb. & Robledo 2017, Grifolaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *A. boa* Gómez-Montoya, Rajchenb. & Robledo, basidioma resupinate, effused-reflexed to pileate, hymenophore poroid, wood-rotting, white rot, sequence data available, see Gómez-Montoya et al. 2017b (phylogeny, Argentina).

Aeruginospora Höhn. 1908, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *A. singularis* Höhn., Australia, Southeast Asia, see Kirk et al. 2013 (genus accepted), sequence data unavailable, see Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae).

Afroboletus Pegler & T.W.K. Young 1981, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, eight species, type species *A. pterosporus* (Singer) Pegler & T.W.K. Young, mostly stipitate-pileate, ectomycorrhizal,

Africa, *A. luteolus* reported edible and consumed see Boa 2004, Kirk et al. 2013 (genus accepted), sequence data available, see Han et al. 2017 (new, sequestrate species, Zambia), Sato et al. 2017 (phylogeny, biogeography), Crous et al. 2018b (new species, Vietnam, generic placement doubtful).

Afrocastellanoa M.E. Sm. & Orihara 2017, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one described species but DNA evidence of more, type species *A. ivoryana* (Castellano, Verbeken & Thoen) M.E. Sm. & Orihara, sequestrate, ectomycorrhizal, Africa, sequence data available, see Orihara and Smith 2017 (phylogeny).

Agaricochaete Eichelb. 1906, Pleurotaceae, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *A. mirabilis* Eichelb., Africa, Asia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Agaricostilbum J.E. Wright 1970, Agaricostilbaceae, Agaricostilbales, Agaricostilbomycetes, sexual and asexual morph known, c. four species, type species *A. palmicola* J.E. Wright, sequence data available, see Kurtzman et al. 2011 (taxonomy), McLaughlin et al. 2017 (phylogeny, evolution).

Agaricus L. 1753, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 500 species, type species *A. campestris* L., six subgenera: *Minores*, *Minoriopsis*, *Flavoagaricus*, *Spissicaules*, *Pseudochitonia*, *Agaricus*, 23 sections, agaricoid, sequestrate, saprobes, terrestrial, worldwide, some species edible, button mushroom (*A. bisporus* (J.E. Lange) Imbach), see Largeteau et al. 2011 (cultivation), Dai et al. 2010b (China, edible mushrooms), Kirk et al. 2013 (genus accepted), sequence data available, see Geml et al. 2004, 2008a (North America, arctic and boreal spp.), Kerrigan et al. 2008 (section *Bivelares*), Parra 2008 (Europe, monograph), Zhao et al. 2011 (phylogeny), Lebel and Syme 2012 (Australia, sequestrate species), Parra 2013 (Europe, monograph), Chen et al. 2015a (section *Brunneopicti*), Kerrigan 2016 (North America, monograph), Zhao et al. 2016f (phylogeny, taxonomy), Zhou et al. 2016c (section *Xanthodermatei*, phylogeny), new spp. see Parra et al. 2011 (Italy), Chen et al. 2012a, 2017b (Thailand, subgenus *Minores*, Europe, Greater Mekong Subregion), Lebel and Syme 2012 (Australia), Wisitrassameewong et al. 2012 (Thailand, *A. subrufescens*), Zhao et al. 2012, 2013d (Thailand), Lebel et al. 2013 (Australia), Li et al. 2014e (China), Karunarathna et al. 2014 (Thailand), Thongklang et al. 2014 (tropical Asia), (Thailand), Parra et al. 2014 (Spain), Gui et al. 2015 (China), He and Zhao 2015 (China), Wang et al. 2015j (China), Bates et al. 2016 (new combinations), Drewinski et al. 2017 (Brazil), He et al. 2017a, 2018a, b (section *Minores*, China, Thailand, new section), Angelini et al. 2018 (Caribbean).

Agrocybe Fayod 1889, Strophariaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 100 species, type species *A. praecox* (Pers.) Fayod, worldwide, some species edible [*A. aegerita* (V. Brig.) Singer (current name: *Cyclocybe aegerita* (V. Brig.) Vizzini)], see Hall et al. 2003 (edible mushrooms), Dai et al. 2010b (Chinese edible mushrooms), Chen et al. 2012c (China, *A. aegerita*), Kirk et al. 2013 (genus accepted), sequence data available, Malysheva and Kiyashko 2011 (Russia, *A. pediades*), new spp. see Uhart and Albertó 2009 (mating tests).

Agrogaster D.A. Reid 1986, Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *A. coneae* D.A. Reid, terrestrial, New Zealand, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Ahmadiago Vánky 2004, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, one species, type species plant parasite on Euphorbiaceae, India, cultures unavailable, sequence data unavailable, see Vánky 2004 (description).

Aizoago Vánky 2013, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, two species, type species *A. tetragoniae* Vánky & R.G. Shivas, plant parasites (stems, fruits) on *Tetragonia* spp. (Aizoaceae), Australia, cultures unavailable, sequence data unavailable, see Vanky and Shivas 2013 (description).

Akenomyces G. Arnaud ex D. Hornby 1984, *incertae sedis*, *incertae sedis*, Agaricomycetes, one species, type species *A. costatus* D. Hornby, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Albatrellopsis Teixeira 1993, Albatrellaceae, Russulales, Agaricomycetes, asexual morph unknown, eight species, type species *A. confluens* (Alb. & Schwein.) Teixeira, basidioma piletae-stipitate, confluent, hymenophore poroid, ectomycorrhizal, edible species (*A. confluens*), see Zheng and Liu 2008 (China), sequence data available, see Audet 2010 (phylogeny).

Albatrellus Gray 1821, Albatrellaceae, Russulales, Agaricomycetes, asexual morph unknown, 22 species, type species *A. albidus* Gray, worldwide, basidioma piletae-stipitat, hymenophore poroid, fleshy, ectomycorrhizal, some species poisonous [*A. dispansus* (Lloyd) Canf. et Gilb], see Bau et al. 2014 (poisonous mushrooms, China), some species edible (*A. yunnanensis* H.D. Zheng & P.G. Liu, *A. zhuangii* Y.C. Dai & Juan Li), see Dai et al. 2010b (edible mushrooms, China), and *A. ellisii* (Berk.) Pouzar, called "bull tongue" and *A. subrubescens* (Murrill) Pouzar, are sold in Mexico markets), Kirk et al. 2013 (genus accepted), sequence data available, see Gordon and Apple 2011 (genetic markers), Dentinger et al. 2011 (DNA barcode markers), Vadthanarat et al. 2017 (Thailand), new spp. see Cui et al. 2008 (China), Khan et al. 2018 (Pakistan).

Albomagister Sánchez-García, Birkebak & Matheny 2014, Tricholomataceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *A. subaustralis* (A.H. Sm. & Hesler) Sánchez-García, Birkebak & Matheny, North America and Europe, sequence data available, see Sánchez-García et al. 2014 (taxonomy), new spp. see Moreau et al. 2015a (Corsica).

Aldridgea Massee 1892, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, one species, type species *A. gelatinosa* Massee, sequence data unavailable, see Kirk et al. 2008.

Alessioporus Gelardi, Vizzini & Simonini 2014, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *A. ichnusanus* (Alessio, Galli & Littini) Gelardi, Vizzini & Simonini, stipitate-pileate when mature, development secondary angiocarpic, ectomycorrhizal, Europe, North America, sequence data available, see Gelardi et al. 2014b (taxonomy), Frank et al. 2017 (North America, new spp.).

Aleurobotrys Boidin 1986, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, ten species, type species *A. botryosus* (Burt) Boidin, Lanq. & Gilles, see Kirk et al. 2013 (genus accepted), sequence data available, see Dai and He 2017 (phylogeny, *Aleurodiscus s. l.*).

Aleurocystidiellum P.A. Lemke 1964, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, three species, type species *A. subcruentatum* (Berk. & M.A. Curtis) P.A. Lemke, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Dai and He 2017 (phylogeny, *Aleurodiscus s. l.*).

Aleurocystis Lloyd ex G. Cunn. 1956, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *A. hakgallae* (Berk. & Broome) G. Cunn., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Giraldo et al. 2017 (phylogeny).

Aleurodiscus Rabenh. Ex J. Schröt. 1888, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, 27 species, type species *A. amorphus* (Pers.) J. Schröt., worldwide, some species medicinal use (*A. amorphus* Rabenh), see Dai and Yang 2008 (medicinal mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Dai and He 2017 (phylogeny, *Aleurodiscus s. l.*).

Aleuromyces Boidin & Gilles 2002, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *A. gabonicus* (Boidin, Lanq. & Gilles) Boidin & Gilles, Gabon, sequence data unavailable, see Kirk et al. 2008.

Allantula Corner 1952, Pterulaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *A. diffusa* Corner, terrestrial, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Allescheriella Henn. 1897, Botryobasidiaceae, Cantharellales, Agaricomycetes, sexual morph *Botryobasidium* Donk 1931, see Gónzalez et al. 2016, five species, type species *A. uredinioides* Henn., widespread, polyphyletic across orders, in need of modern interpretation, sequence data unavailable, see Kirk et al. 2008.

Alloclavaria Dentinger & D.J. McLaughlin 2007, Rickenellaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *A. purpurea* (Fr.) Dentinger & D.J. McLaughlin, Europe, sequence data available, see Dentinger and McLaughlin 2006 (taxonomy).

Allodus Arthur 1906, Pucciniaceae, Pucciniales, Pucciniomycetes, one species, type species *A. podophylli* (Schwein.) Arthur, biotrophic on Berberidaceae, terrestrial, eastern Canada and USA, ?China, sequence data available, see Minnis et al. 2012 (genus resurrected, neotype designated, lectotype designated, molecular analysis).

Allotelium Syd. 1939, Raveneliaceae, Pucciniales, Pucciniomycetes, one species, type species *A. mirabile* Syd., biotrophic on Fabaceae, terrestrial, South America (Ecuador), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Alpova C.W. Dodge 1931, Paxillaceae, Boletales, Agaricomycetes, asexual morph unknown, 16 species, type species *A. cinnamomeus* C.W. Dodge, ectomycorrhizal, see Kirk et al. 2013 (genus accepted), widespread, sequence data available, see Vizzini et al. 2010b (phylogeny), Rochet et al. 2011 (Europe, host, phylogeny), new spp. see Moreau et al. 2011, 2013 (Europe), Hayward et al. 2014 (North America).

Alutaceodontia (Parmasto) Hjortstam & Ryvarden 2002, Schizoporaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *A. alutacea* (Fr.) Hjortstam & Ryvarden, sequence data unavailable, see Kirk et al. 2008.

Alveolaria Lagerh. 1891 [1892], Pucciniosiraceae, Pucciniales, Pucciniomycetes, two species, type species *A. cordiae* Lagerh., biotrophic on Boraginaceae, terrestrial, South America (Ecuador), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Alysidium Kunze 1817, Botryobasidiaceae, Cantharellales, Agaricomycetes, sexual morph *Botryobasidium* see Gónzalez et al. 2016, four species, type species *A. fulvum* Kunze & J.C. Schmidt, Europe, polyphyletic across orders, in need of modern interpretation on morphology, sequence data unavailable, see Kirk et al. 2008.

Amanita Pers. 1797, Amanitaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 570 species, type species *A. muscaria* (L.) Lam., most species ectomycorrhizal, some saprobic, agaricoid or secotioid, terrestrial, three subgenera: *Amanita*, *Amanitina* and *Lepidella*, eleven sections, worldwide, several species lethal (*A. phalloides*

(Fr.: Fr.) Link), some species edible (*A. caesarea* (Scop.) Pers.), see Hall et al. 2003 (edible mushrooms), Dai et al. 2010b (Chinese edible mushrooms), Justo et al. 2010 (secotioid and gasteroid taxa), Kirk et al. 2013 (genus accepted), sequence data available, see Geml et al. 2008b (*A. muscaria* species complex, phylogeography), Sanmee et al. 2008 (Northern Thailand), Menolli et al. 2009a, b (Brazil), Zhang et al. 2010a (monograph, phylogeny, keys), Cai et al. 2014 (phylogeny, biogeography), Sánchez-Ramírez et al. 2015 (sect. *Caesareae*, biogeography), Tang et al. 2015 (tropical Africa, section *Vaginatae* s.l.), Cai et al. 2016 (review, China, lethal *Amanita*), Tulloss et al. 2016 (taxonomy), Cui et al. 2018 (phylogeny), new spp. see Wartchow et al. 2009 (Brazil), Tulloss et al. 2011 (Central America), Bojantchev and Davis 2013 (North America), Davison et al. 2013 (Australia), Li and Cai 2014 (China), Davison et al. 2015 (Australia), Hosen et al. 2015 (Bangladesh), Li et al. 2015b (China), Wartchow et al. 2015a (Brazil), Thongbai et al. 2016, 2017a (Thailand), Wartchow and Cortez 2016 (Brazil), Truong et al. 2017a (South America, sequestrate spp.), Ebika and Yorou 2017 (Africa), Hosen et al. 2018b (India), Fraiture et al. 2019 (Africa).

Amaropostia B.K. Cui, L.L. Shen & Y.C. Dai 2019, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *A. stiptica* (Pers.) B.K. Cui, L.L. Shen & Y.C. Dai., China, Europe, USA, wood-rotting, sequence data available, see Shen et al. 2019 (taxonomy, phylogeny).

Amauroderma Murrill 1905, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 40 species, type species *A. regulicolor* (Berk. ex Cooke) Murrill, mostly stipitate basidioma, hymenophore poroid, terrestrial or wood-rotting, white rot, widespread (pantropical), parasitic on the roots of living trees, see Glen et al. 2009 (root-rot disease of *Acacia mangium*), some species medicinal use, see Jiao et al. 2013 [anticancer activities, *A. rude* (Berk.) Torrend], Gomes-Silva and Gibertoni 2012 (taxonomy), Kirk et al. 2013 (genus accepted), sequence data available, see Costa-Rezende et al. 2017 (phylogeny), new spp. see Gomes-Silva et al. 2015 (phylogeny, Brazil), Costa-Rezende et al. 2016 (phylogeny, Brazil), Song et al. 2016b (phylogeny, China).

Amaurodon J. Schröt. 1888, Thelephoraceae, Thelephorales, Agaricomycetes, asexual morph unknown, ten species, type species *A. viridis* (Alb. & Schwein.) J. Schröt., worldwide, wood-rotting, see Kirk et al. 2013 (genus accepted), sequence data available, see Miettinen and Koljalg 2007 (phylogeny), new spp. see Gardt et al. 2011 (West Africa).

Amaurohydnum Jülich 1978, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *A. flavidum* Jülich, resupinate basidioma, minutely hydnoid hymenophore, wood-rotting, Australia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Amauromyces Jülich 1978, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *A. pallidus* Jülich, corticioid basidioma, resupinate, wood-rotting, widespread (Australia, Japan, Réunion), see Kirk et al. 2013 (genus accepted), sequence data unavailable, see Chen and Oberwinkler 2004 (morphology, China).

Ambivina Katz 1974, *incertae sedis*, Corticiales, Agaricomycetes, asexual morph unknown, one species, type species *A. filobasidia* Katz, found in USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Amethicium Hjortstam 1983, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *A. rimosum* Hjortstam, basidioma resupinate basidioma, hymenophore smooth, wood-rotting, Tanzania, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Amparoina Singer 1958, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *A. spinosissima* (Singer) Singer, terrestrial, South America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Amphinema P. Karst. 1892, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, four species, type species *A. sordescens* (P. Karst.) P. Karst., widespread, symbiotic, see Kirk et al. 2013 (genus accepted), sequence data available, see Nygren et al. 2008 (ectomycorrhizal, phylogeny), Menkis et al. 2010 (mycorrhization), Schoch et al. 2012 (DNA barcode marker), Roy et al. 2013 (ectomycorrhizal), Nuñez et al. 2013 (ecology), Luoma and Eberhart 2014 (ectomycorrhizal fungus diversity), Miyamoto et al. 2014 (mid-domain effect in ectomycorrhizal), Malysheva 2017a, b (mycorrhiza of pyroloids, Russia), Lazarević and Menkis 2018 (ecology).

Amphistereum Spirin & Malysheva 2017, Auriculariaceae, Auriculariales, Agaricomycetes, asexual morph unknown, two species, type species *A. schrenkii* (Burt) Spirin & Malysheva, wood-rotting, sequence data available, see Malysheva and Spirin 2017 (taxonomy, phylogeny, stereoid basidiocarps, Auriculariales).

Ampulloclitocybe Redhead, Lutzoni, Moncalvo & Vilgalys 2002, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *A. clavipes* (Pers.) Redhead, Lutzoni, Moncalvo & Vilgalys, worldwide, sequence data available, see Walther et al. 2005 (phylogeny), Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae).

Amylaria Corner 1955, Bondarzewiaceae, Russulales, Agaricomycetes, asexual morph unknown, one species,

type species *A. himalayensis* Corner, Bhutan, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Amyloathelia Hjortstam & Ryvarden 1979, Amylocorticiaceae, Amylocorticiales, Agaricomycetes, asexual morph unknown, three species, type species *A. amylacea* (Bourdot & Galzin) Hjortstam & Ryvarden, Europe, South America, see Kirk et al. 2013 (genus accepted), sequence data unavailable.

Amylobasidium Ginns 1988, *incertae sedis*, Corticiales, Agaricomycetes, asexual morph unknown, one species, type species *A. tsugae* Ginns, found in USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Amylocorticiellum Spirin & Zmitr. 2002, Amylocorticiaceae, Amylocorticiales, Agaricomycetes, asexual morph unknown, four species, type species *A. subillaqueatum* (Litsch.) Spirin & Zmitr., widespread, terrestrial, see Zmitrovich 2008 (species manual), Gorjón et al. 2011b (notes, new combination), sequence data available, Binder et al. 2010 (molecular phylogeny).

Amylocorticium Pouzar 1959, Amylocorticiaceae, Amylocorticiales, Agaricomycetes, asexual morph unknown, eleven species, type species *A. subsulphureum* (P. Karst.) Pouzar, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2010 (phylogeny).

Amylocystis Bondartsev & Singer 1944, Dacryobolaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *A. lapponica* (Romell) Bondartsev & Singer, poroid hymenophore, wood-rotting, brown rot, circumboreal distribution in coniferous forests, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson 2007b (phylogeny), Justo et al. 2017 (phylogeny, Polyporales).

Amyloflagellula Singer 1966, Marasmiaceae, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *A. pulchra* (Berk. & Broome) Singer, saprophytic, tropical America and Asia, see Kirk et al. 2013 (genus accepted), sequence data available, see Bodensteiner et al. 2004 (phylogeny, cyphelloid homobasidiomycetes). Recognized as a synonym of *Marasmius* (Desjardin unpubl. data).

Amylofungus Sheng H. Wu 1996, Peniophoraceae, Russulales, Agaricomycetes, asexual morph unknown, two species, type species *A. corrosus* (G. Cunn.) Sheng H. Wu, New Zealand, Japan, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Amylohyphus Ryvarden 1978, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *A. africanus* Ryvarden, Rwanda, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Amylolepiota Harmaja 2002, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *A. lignicola* (P. Karst.) Harmaja, Europe, sequence data unavailable, see Kirk et al. 2008.

Amylonotus Ryvarden 1975, Auriscalpiaceae, Russulales, Agaricomycetes, asexual morph unknown, six species, type species *A. africanus* Ryvarden, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Chen et al. 2016b (systematics, *Wrightoporia s. l.*).

Amyloporia Singer 1944, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *A. calcea* (Fr.) Bondartsev & Singer, basidioma resupinate, hymenophore poroid, wood-rotting, brown rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Han et al. 2016a (taxonomy, phylogeny), Justo et al. 2017 (phylogeny, Polyporales), new spp. see Rajchenberg et al. 2011 (new combination, phylogeny, Patagonia, Argentina, Chile?), Cui and Dai 2013 (new combination, phylogeny, China).

Amylosporomyces S.S. Rattan 1977, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, two species, type species *A. echinosporus* S.S. Rattan, worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Amylosporus Ryvarden 1973, Bondarzewiaceae, Russulales, Agaricomycetes, asexual morph unknown, twelve species, type species *A. graminicola* (Murrill) Ryvarden, basidioma resupinate, pileate to stipitate, hymenophore poroid, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Chen and Shen 2014 (new sp., morphology, phylogeny, China), Campi et al. 2017 (new sp., taxonomy, phylogeny, Paraguay).

Amylostereum Boidin 1958, Echinodontiaceae, Russulales, Agaricomycetes, asexual morph unknown, five species, type species *A. chailletii* (Pers.) Boidin, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Bergeron et al. 2008 (Canada, new record), Fitza et al. 2016 (host specificity, diversity, Japan), Zhao et al. 2017c (phylogeny), new spp. see Olatinwo et al. 2013 (America).

Amyloxenasma (Oberw.) Hjortstam & Ryvarden 2005, Amylocorticiaceae, Amylocorticiales, Agaricomycetes, asexual morph unknown, six species, type species *A. grisellum* (Bourdot) Hjortstam & Ryvarden, widespread, saprobes, terrestrial, sequence data available, see Binder et al. 2010 (phylogeny).

Anamika K.A. Thomas, Peintner, M.M. Moser & Manim. 2002, Hymenogastraceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *A. indica* K.A. Thomas, Peintner, M.M. Moser & Manim. (current name: *Hebeloma indicum* (K.A. Thomas, Peintner, M.M. Moser & Manim.) B.J. Rees 2013), terrestrial, ectomycorrhizal, India, China, sequence data available, see Thomas et al. 2002 (genus accepted), Yang et al. 2005 (phylogeny).

Anastomyces W.P. Wu, B. Sutton & Gange 1997, *incertae sedis*, *incertae sedis*, Basidiomycota, sexual morph unknown, one species, type species *A. microsporus* W.P. Wu, B. Sutton & Gange, fungicolous, China, sequence data unavailable, see Kirk et al. 2013 (genus accepted), Seifert et al. 2011 (genera of Hyphomycetes).

Anastrophella E. Horak & Desjardin 1994, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *A. subpeltata* (Redhead) E. Horak & Desjardin, terrestrial, saprobic, New Zealand, Hawaii, Japan, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Andebbia Trappe, Castellano & Amar. 1996, Mesophelliaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, one species, type species *A. pachythrix* (Cooke & Massee) Trappe, Castellano & Amar., Australia, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2008 (biogeography, Hysterangiales).

Anguillomyces Marvanová & Bärl. 2000, *incertae sedis*, *incertae sedis*, Basidiomycota, sexual morph Basidiomycota, one species, type species *A. acadiensis* Marvanová & Bärl., Canada, fresh water, sequence data unavailable, see Kirk et al. 2013, Seifert et al. 2011 (morphology).

Anomalomyces Vánky, M. Lutz & R.G. Shivas 2006, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, two species, plant parasites (ovaries) on *Panicum* spp. (Poaceae), Australia, cultures unavailable, sequence data available, see McTaggart et al. 2012b (phylogeny), Begerow et al. 2014 (taxonomy), Wang et al. 2015c (taxonomy, phylogeny).

Anomoloma Niemelä & K.H. Larss. 2007, Amylocorticiaceae, Amylocorticiales, Agaricomycetes, asexual morph unknown, six species, type species *A. albolutescens* (Romell) Niemelä & K.H. Larss, basidioma resupinate, strongly rhizomorphic, wood-rotting, white rot, widespread, sequence data available, see Binder et al. 2010 (phylogeny, morphology), new spp. see Song et al. 2016a (monograph, phylogeny, China).

Anomoporia Pouzar 1966, Amylocorticiaceae, Amylocorticiales, Agaricomycetes, asexual morph unknown, eight species, type species *A. bombycina* (Fr.) Pouzar, basidioma resupinate, hymenophore poroid, wood-rotting, brown rot, north temperate, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson 2004 (phylogeny), Binder et al. 2010 (phylogeny, morphology), Song et al. 2016a (phylogeny, China).

Antella Miettinen 2016, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *A. niemelaei* (Vampola & Vlasák) Miettinen, poroid hymenophore, wood-rotting, subtropical widespread (China, Venezuelan Andes), sequence data available, see Miettinen and Ryvarden 2016 (new genus, new combinations, phylogeny), Zmitrovich 2018a (taxonomy).

Antherospora R. Bauer, M. Lutz, Begerow, Piątek & Vánky 2008, Floromycetaceae, Urocystidales, Ustilaginomycetes, twelve species, type species *A. vaillantii* (Tul. & C. Tul.) R. Bauer, M. Lutz, Begerow, Piątek & Vánky, plant parasites (flowers) on Hyacinthaceae, Africa, North America, Asia, Europe, cultures available, sequence data available, see Piątek et al. 2013b (phylogeny), Begerow et al. 2014 (phylogeny).

Anthomyces Dietel 1899, Raveneliaceae, Pucciniales, Pucciniomycetes, one species, type species *A. brasiliensis* Dietel, biotrophic on Fabaceae, terrestrial, South America (Brazil), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Anthomycetella Syd. & P. Syd. 1916 (= *Reyesiella* Sacc. 1917), Raveneliaceae, Pucciniales, Pucciniomycetes, one species, type species *A. canarii* Syd. & P. Syd., biotrophic on Burseraceae, terrestrial, Philippines, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Anthoporia Karasiński & Niemelä 2016, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *A. albobrunnea* (Romell) Karasiński & Niemelä, basidioma resupinate, hymenophore poroid, wood-rotting, brown rot, widespread (North America, Eurasia), sequence data available, see Karasiński and Niemelä 2016 (new genus, new combination, morphology), Justo et al. 2017 (phylogeny, Polyporales).

Anthracocystis Bref. 1912, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, 134 species, type species *A. destruens* Bref., plant parasites (flowers) on Poaceae, widespread, saprobic yeast states on plants, cultures available, sequence data available, see Begerow et al. 2014 (taxonomy), Piątek et al. 2015 (phylogeny), Wang et al. 2015c (taxonomy, phylogeny).

Anthracoidea Bref. 1895, (= *Cintractiomyxa* Golovin 1952), Anthracoideaceae, Ustilaginales, Ustilaginomycetes, 112 species, type species *A. caricis* (Pers.) Bref., plant parasites (ovaries) on Cyperaceae (mainly *Carex* spp.), circumpolar, arctic-alpine, saprobic states, cultures available, see Kirk et al. 2013 (genus accepted), sequence data available, see Begerow et al. 2014 (taxonomy).

Anthracophyllum Ces. 1879, Omphalotaceae, Agaricales, Agaricomycetes, asexual morph unknown, twelve species, type species *A. beccarianum* Ces., worldwide, on wood, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Matheny et al. 2007b (phylogeny).

Antrodia P. Karst. 1879, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 80 species (needs revision since genus shown to be polyphyletic), type species *A. serpens* (Fr.) P. Karst. (current name: *A. albida* (Fr.) Donk), poroid hymenophore, wood-rotting, brown rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Ortiz-Santana et al. 2013

(phylogeny), Spirin et al. 2013a (phylogeny, morphology, new combinations), new spp. see Kout and Vlasák 2009 (phylogeny, USA), Rivoire 2010 (morphology, France), Cui et al. 2011d (morphology, China), Vlasák et al. 2012 (phylogeny, USA), Spirin et al. 2013a (phylogeny, new records, Russia), Cui 2013a (phylogeny, China), Vlasák et al. 2013 (phylogeny, Slovakia), Park et al. 2014c (phylogeny, South Korea), Spirin et al. 2015d (phylogeny, new combination, *Antrodia crassa* group, Czech Republic, Estonia, USA), Chen and Cui 2016 (phylogeny, *Antrodia heteromorpha* complex, China), Kaipper-Figueiró et al. 2016 (phylogeny, Brazil), Spirin 2016 (phylogeny, taxonomy), Spirin et al. 2016a (phylogeny, new combination, *A. malicola* group, Indonesia, Russia), Chen and Wu 2017 (phylogeny, China), Kout et al. 2017 (phylogeny, Canary Islands), Spirin et al. 2017a (phylogeny, new combinations, *Antrodia serialis* group, Russia, USA), Yuan et al. 2017e (phylogeny, Uzbekistan), new combinations see Ryvarden and Melo 2014 (morphology, polypores, Europe), Ryvarden et al. 2017 (morphology, polypores, Europe).

Antrodiella Ryvarden & I. Johans. 1980, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 50 species, type species *A. semisupina* (Berk. & M.A. Curtis) Ryvarden, see Kirk et al. 2013 (genus accepted), poroid hymenophore, wood-rotting, white rot, cosmopolitan but temperate, some species medicinal use, see Lu et al. 2013 (medicinal use), sequence data available, see Cui et al. 2008 (molecular characters), Miettinen et al. 2012 (morphology, phylogeny), new spp. see Vampola and Vlasák 2011 (America), Yuan and Qin 2012 (China), Yuan 2013a (China), Gurpreet et al. 2015 (India), Justo et al. 2017 (phylogeny, Polyporales).

Antrodiopsis Audet 2017, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *A. oleracea* (R.W. Davidson & Lombard) Audet, basidioma resupinate, poroid hymenophore, sequence data available, see Audet 2017c (new combination).

Anupama K.N.A. Raj, K.P.D. Latha & Manim. 2019, Biannulariaceae, Agaricales, asexual morph unknown, one species, type species *A. indica* K.N.A. Raj, K.P.D. Latha & Manim., India, sequence data available, see Raj et al. 2019 (taxonomy, phylogeny).

Aphanobasidium Jülich 1979, Pterulaceae, Agaricales, Agaricomycetes, asexual morph unknown, 17 species, type species *A. subnitens* (Bourdot & Galzin) Jülich, worldwide, wood-rotting (*A. subnitens* (Bourdot & Galzin) Jülic), see Zmitrovich 2008 (species manual), Kirk et al. 2013 (genus accepted), see Prasher and Ashok 2013 (wood-inhabiting fungi checklist, Himachal Pradesh), sequence data available, see Binder et al. 2010 (phylogeny).

Aphelaria Corner 1950, Aphelariaceae, Cantharellales, Agaricomycetes, 20 species, type species *A. dendroides* (Jungh.) Corner, widespread, polyphyletic across orders, in need of modern interpretation, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Aphelariopsis Jülich 1982, Septobasidiaceae, Septobasidiales, Pucciniomycetes, sexual morph unknown, two species, type species *A. borneensis* (Jülich) Jülich (current name: *Paraphelaria borneensis* Jülich), Sarawak, south America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Aphroditeola Redhead & Manfr. Binder 2013, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *A. olida* (Quél.) Redhead & Manfr. Binder, Europe, sequence data available, see Redhead 2013a (taxonomy), Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae).

Aphyllotus Singer 1973, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *A. campanelliformis* Singer, Colombia, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Apioperdon (Kreisel & D. Krüger) Vizzini 2017, Lycoperdaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *A. pyriforme* (Schaeff.) Vizzini, sequence data available, see Vizzini and Ercole 2017 (phylogeny, taxonomy).

Apiotrichum Stautz 1931, Trichosporonaceae, Trichosporonales, Tremellomycetes, sexual morph unknown, 21 species, types pecies *A. porosum* Stautz, yeast, on wood, soil, human skin, widespread, cultures and sequence data available, see Liu et al. 2015b (phylogeny), James et al. 2016 (new spp.), Takashima et al. 2018 (taxonomy and phylogeny).

Aplopsora Mains 1921, Chaconiaceae, Pucciniales, Pucciniomycetes, six species, type species *A. nyssae* Mains, biotrophic on Cornaceae, Fabaceae, Nyssaceae, Vochysiaceae, Urticaceae, terrestrial, North America, South America (Brazil), Japan, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Aporophallus Möller 1895, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *A. subtilis* Möller, terrestrial, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Apra J.F. Hennen & F.O. Freire 1979, Raveneliaceae, Pucciniales, Pucciniomycetes, one species, type species *A. bispora* J.F. Hennen & F.O. Freire, biotrophic on Fabaceae, terrestrial, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Aquascypha D.A. Reid 1965, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *A. hydrophora* (Berk.) D.A. Reid, stipitate stereoid basidioma, wood-rotting, Central and South America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Arachnion Schwein. 1822, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, 13 species, type species *A. album* Schwein., subtropical, see Kirk et al. 2013 (genus accepted), sequence data available, see Miller et al. 2011 (fungus identification), new spp. see see Trierveiler-Pereira et al. 2018 (Brazil).

Araeocoryne Corner 1950, Gomphaceae, Gomphales, Agaricomycetes, asexual morph unknown, one species, type species *A. elegans* Corner, wood-decaying, Malaysia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Arambarria Rajchenb. & Pildain 2015, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *A. cognata* (Speg.) Rajchenb. & Pildain, type species on dead branches and stems of *Lomatia hirsuta* (Proteaceae) and *Diostea juncea* (Verbenaceae), basidioma poroid, wood-rotting, white rot, sequence data available, see Rajchenberg et al. 2015 (phylogeny, poroid Hymenochaetaceae, Patagonia, Argentina), Pildain et al. 2017 (pathogen, canker rot of *Eucalyptus* in Uruguay, stem-rot of *Vitis vinifera* in Argentina and Chile).

Arcispora Marvanová & Bärl. 1998, *incertae sedis*, *incertae sedis*, Basidiomycota, sexual morph unknown, one species, type species *A. bisagittaria* Marvanová & Bärl., aquatic, Canada, sequence data unavailable, see Kirk et al. 2013 (genus accepted), Seifert et al. 2011 (genera of Hyphomycetes).

Arcticomyces Savile 1959, Exobasidiaceae, Exobasidiales, Exobasidiomycetes, one species, tyepe species *A. warmingii* (Rostr.) Savile, plant parasite on *Saxifraga* spp. (Saxifragaceae), Europe, cultures unavailable, sequence data available, see Begerow et al. 2002, 2014 (taxonomy), Wang et al. 2015c (phylogeny).

Armillaria (Fr.) Staude 1857, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, 39 species, type species *A. mellea* (Vahl) P. Kumm, worldwide, parasitic, saprobic, honey fungus, wood pathogen (*A. ostoyae* (Romagn.) Herink), edible (*A. mellea* (Vahl) P. Kumm.), see Hall et al. 2003 (edible mushrooms), Dai et al. 2010b (Chinese edible mushrooms), Pildain et al. 2010 (Argentina), Kirk et al. 2013 (genus accepted), Koch et al. 2017 (biogeography, taxonomy), sequence data available, see Ross-Davis et al. 2012 (phylogeny, North American), Klopfenstein et al. 2017 (phylogeny, Northern Hemisphere), new spp. see Lima et al. 2008 (Brazil), Brazee et al. 2012a (North America), Hood and Ramsfield 2016 (New Zealand), Elías-Román et al. 2018 (Mexico), Park et al. 2018 (Korea).

Aroramyces Castellano & Verbeken 2000, Hysterangiaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, c. five species, type species *A. gelatinosporus* (Cribb) Castellano, hypogeous, basidioma gasteroid, only known from Zimbabwe, Mexico and Queensland, Australia, ectomycorrhizal with angiosperms and gymnosperms, sequence data available, see Hosaka et al. 2008 (phylogeny), Guevara-Guerrero et al. 2016 (Mexico).

Arrasia Bernicchia, Gorjón & Nakasone 2011, *incertae sedis*, *incertae sedis*, Basidiomycota, asexual morph unknown, one species, type species *A. rostrata* Bernicchia, Gorjón & Nakasone, Italy, sequence data unavailable, see Bernicchia et al. 2011 (taxonomy).

Arrhenia Fr. 1849, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 36 species, type species *A. auriscalpium* (Fr.) Fr., temperate, see Kirk et al. 2013 (genus accepted), sequence data available, see Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Larsson 2007a (phylogeny), Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae), new spp. see Desjardin and Perry 2017 (São Tomé and Príncipe, Africa).

Arthrodochium R.F. Castañeda & W.B. Kendr. 1990, *incertae sedis*, *incertae sedis*, Agaricomycetes, one species, type species *A. candidum* R.F. Castañeda & W.B. Kendr., Cuba, sequence data unavailable, see Kirk et al. 2013 (genus accepted), Seifert et al. 2011 (genera of Hyphomycetes).

Arthromyces T.J. Baroni & Lodge 2007, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *A. claviformis* T.J. Baroni & Lodge, America, sequence data available, see Baroni et al. 2007 (taxonomy), Bellanger et al. 2015 (phylogeny).

Arthrosporella Singer 1970 (= *Nothoclavulina* Singer 1970 *fide* Index Fungorum 2019, Art. 59.1), *incertae sedis*, Agaricales, Agaricomycetes, asexual morph was previously known in *Nothoclavulina* Singer 1970, one species, type species *A. ditopa* (Singer) Singer, America, sequence data unavailable, see Kirk et al. 2013 (genus accepted), Seifert et al. 2011 (genera of Hyphomycetes).

Arthuria H.S. Jacks. 1931, Phakopsoraceae, Pucciniales, Pucciniomycetes, six species, type species *A. catenulata* H.S. Jacks. & Holw., biotrophic on Apocynaceae, Euphorbiaceae, Phyllanthaceae, terrestrial, Brazil, Columbia, India, Mexico, see Kirk et al. 2013 (genus accepted), sequence data available, see Zuluaga et al. 2011 (phylogeny, Uredinales, Colombian Andean region).

Arthuriomyces Cummins & Y. Hirats. 1983, Phragmidiaceae, Pucciniales, Pucciniomycetes, asexual morph unknown, three species, type species *A. peckianus* (Howe) Cummins & Y. Hirats., north America, Russia, China, Japan, on *Rubus*, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Artomyces Jülich 1982, Auriscalpiaceae, Russulales, Agaricomycetes, asexual morph unknown, 17 species, type species *A. pyxidatus* (Pers.) Jülich, wood-rotting, worldwide, sequence data available, new sp. see Kneal and Smith 2015 (Chile).

Arualis Katz 1980, *incertae sedis*, *incertae sedis*, Agaricomycetes, one species, type species *A. carolinensis* Katz, USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Aseroë Labill 1800, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, two species, type species *A. rubra* Labill, terrestrial, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006 (phylogeny), Trierveiler-Pereira et al. 2014a (phylogeny, morphology).

Asproinocybe R. Heim 1970, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *A. lactifera* R. Heim, tropical Africa, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Aspropaxillus Kühner & Maire 1934, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *A. giganteus* (Sowerby) Kühner & Maire (current name: *Leucopaxillus giganteus* (Sowerby) Singer), sequence data available, see Vizzini et al. 2012b (new combinations, phylogeny).

Asterocyphella W.B. Cooke 1961, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *A. floccosa* W.B. Cook, worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Asterodon Pat. 1894, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *A. ferruginosus* Pat., widespread (North temperate), basidioma resupinate, smooth hymenophore, wood-rotting, white rot, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2004 (phylogeny).

Asterophora Ditmar 1809, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph *Ugola* Adans. 1763, three species, type species *A. lycoperdoides* (Bull.) Ditmar, temperate, fungal parasitic, see Kirk et al. 2013 (genus accepted), mycoparasite, sequence data available, see Hofstetter et al. 2014 (phylogeny, Lyophyllaceae).

Asterostroma Massee 1889, Peniophoraceae, Russulales, Agaricomycetes, asexual morph unknown, 19 species, type species *A. apalum* (Berk. & Broome) Massee, worldwide, basidioma resupinate, smooth hymenophore, wood-rotting, white rot, sequence data available, see Suhara 2010 (taxonomy), new spp. see De 2009 (India).

Astraeus Morgan 1889, Diplocystidiaceae, Boletales, Agaricomycetes, asexual morph unknown, eleven species, type species *A. hygrometricus* (Pers.) Morgan, worldwide, earthstar, some species medicinal use (*A. hygrometricus* (Pers.) Morgan), see Dai and Yang 2008 (medicinal mushrooms, China), Lai et al. 2012 (compounds), see Kirk et al. 2013 (genus accepted), sequence data available, see Fangfuk et al. 2010 (Japan), Phosri et al. 2013 (phylogeny), new spp. see Phosri et al. 2013, 2014 (USA, Greece, Thailand), Ryoo et al. 2017 (Korea, Japan).

Atelocauda Arthur & Cummins 1933, Pileolariaceae, Pucciniales, Pucciniomycetes, three species, type species *A. incrustans* Arthur & Cummins, biotrophic on Fabaceae, terrestrial, Asia (China, Japan), Australia, Brazil, Hawaii, Panama, gall rust, see Nelson 2009 (on *Acacia koa*, *A. digitate* (G. Winter) Cummins & Y. Hirats.), see Kirk et al. 2013 (genus accepted), sequence data available, see Yepes and Alves de Carvalho 2014 (new species, discussion).

Athelia Pers. 1822 (= *Fibularhizoctonia* G.C. Adams & Kropp 1996 *fide* Adams and Kropp 1996), Atheliaceae, Atheliales, Agaricomycetes, asexual morph was previously known in *Fibularhizoctonia* (current name: *Athelia* Pers. 1822), 32 species, type species *A. epiphylla* Pers., widespread, see Zmitrovich 2008 (species manual), Kirk et al. 2013 (genus accepted), some species are facultative parasites of plants (including crops) and of lichens, see Esslinger 2016 (checklist), sequence data available, see Lawrey et al. 2007 (phylogeny), Binder et al. 2010 (phylogeny), Xu et al. 2010 (phylogeny).

Athelicium K.H. Larss. & Hjortstam 1986, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, two species, type species *A. stridii* K.H. Larss. & Hjortstam, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Athelidium Oberw. 1965, Stephanosporaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *A. aurantiacum* (M.P. Christ.) Oberw., see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson 2007b (classification, corticioid fungi), new spp. see Yurchenko and Kotiranta 2007 (Belarus and Finland), Zmitrovich 2008 (species manual).

Athelocystis Hjortstam & Ryvarden 2010, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, one species, type species *A. capitata* Hjortstam & Ryvarden, Brazil, sequence data unavailable, see Hjortstam and Ryvarden 2010b (new spp.).

Atheloderma Parmasto 1968, Rickenellaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, two species, type species *A. mirabile* Parmasto, wood-decaying, Europe, Asia, see Zmitrovich 2008 (species manual), Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2006 (phylogeny, hymenochaetoid clade).

Athelopsis Oberw. ex Parmasto 1968, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, 14 species, type species *A. glaucina* (Bourdot & Galzin) Oberw. ex Parmasto, widespread, see Zmitrovich 2008 (species manual), Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2010 (phylogeny), new spp. see Hjortstam et al. 2009 (Western Australia), Singh et al. 2010c (India).

Atheniella Redhead, Moncalvo, Vilgalys, Desjardin & B.A. Perry 2012, Mycenaceae, Agaricales, Agaricomycetes, asexual morph unknown, seven species, type species *A. adonis* (Bull.) Redhead, Moncalvo, Vilgalys, Desjardin & B.A. Perry, worldwide, saprophytic, sequence data unavailable, see Redhead 2012 (taxonomy), new spp. see Lehmann and Lüderitz 2018 (Germany).

Atractidochium Oono, Urbina & Aime 2018, Phleogenaceae, Atractiellales, Atractiellomycetes, sporodochial asexual state, sexual morph unkown, one species, type species *A. hillariae* Oono, Urbina & Aime, abundant hyphal endophytes of *Pinus taeda* needles, nature of association with host unknown, North Carolina (USA), sequence data available, see Aime et al. 2018b (integrative taxonomy).

Atractiella Sacc. 1886, Phleogenaceae, Atractiellales, Atractiellomycetes, seven species, type species *A. brunaudiana* Sacc., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Oberwinkler et al. 2006 (phylogeny, Atractiellales), new spp. see Bonito et al. 2017 (USA, integrative taxonomy, ecology).

Atractocolax R. Kirschner, R. Bauer & Oberw. 1999, *incertae sedis*, *incertae sedis*, Microbotryomycetes, asexual morph unknown, one species, type species *A. pulvinatus* R. Kirschner, R. Bauer & Oberw., Europe, associated with bark beetles, see Kirk et al. 2013 (genus accepted), sequence data unavailable, see Kirk et al. 2008.

Atractogloea Oberw. & Bandoni 1982, Atractogloeaceae, Atractiellales, Atractiellomycetes, sexual morph unknown, one species, type species *A. stillata* Oberw. & Bandoni, USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Atractosporocybe P. Alvarado, G. Moreno & Vizzini 2015, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *A. inornat*a (Sowerby) P. Alvarado, G. Moreno & Vizzini, from the Mediterranean basin to Northern Europe and North America, in either broadleaf or conifer forests, sequence data available, see Alvarado et al. 2015 (taxonomy), new spp. see Gulden and Larsson 2016 (Svalbard, Scandinavia).

Atraporiella Ryvarden 2007, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *A. neotropica* Ryvarden, Belize, sequence data available, see Miettinen and Rajchenberg 2012 (phylogeny), new spp. see Wu et al. 2017c (China).

Atroporus Ryvarden 1973, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *A. diabolicus* (Berk.) Ryvarden., wood-rotting, neotropics, sequence data available, see Palacio et al. 2017 (genus accepted, taxonomy, phylogeny).

Aurantiopileus Ginns, D.L. Lindner & T.J. Baroni 2010, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *A. mayaensis* Ginns, D.L. Lindner & T.J. Baroni, hymenophore poroid, wood-rotting, white rot, widespread (Asia, America), sequence data available, see Ginns et al. 2010 (monograph, new combinations), see Justo et al. 2017 (phylogeny, Polyporales).

Aurantiosporium M. Piepenbr., Vánky & Oberw. 1996, Ustilentylomataceae, Microbotryales, Microbotryomycetes, four species, type species *A. subnitens* (J. Schröt. & Henn.) M. Piepenbr., Vánky & Oberw., worldwide, on Cyperaceae, see Kirk et al. 2013 (genus accepted), sequence data available, see Begerow et al. 1997 (phylogeny).

Aurantiporus Murrill 1905, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, six species (needs revision since genus shown to be polyphyletic, see Papp and Dima 2018), type species *A. pilotae* (Schwein.) Murrill, poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Justo et al. 2017 (phylogeny, Polyporales), Papp and Dima 2018 (new genus, new combination, phylogeny, type study), new sp. see Niemelä et al. 2012 (morphology, Europe).

Aureoboletus Pouzar 1957, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, 33 species, type species *A. gentilis* (Quél.) Pouzar, stipitate-pileate, worldwide, biogeography study see Wrzosek et al. 2017 (*A. projectellus*, biogeography, Europe), some species edible (*A. thibetanus* (Pat.) Hongo & Nagas.), see Dai et al. 2010b (edible mushrooms, China), see Kirk et al. 2013 (genus accepted), sequence data available, see Klofac 2010 (monograph), Nuhn et al. 2013 (phylogeny, Boletineae), Halling et al. 2015 (phylogeny, new combination), Wu et al. 2016f (monograph, new combination, new spp., China), new spp. see Shi and Liu 2013 (China), Zhang et al. 2014a (Guangxi, China), Zeng et al. 2015 (China), Zhang et al. 2015a, b (Hunan, Guangdong, China), Wu et al. 2016e (new combination, new spp., China), Zhang et al. 2017b (Tibet, China).

Auricularia Bull. 1789, Auriculariaceae, Auriculariales, Agaricomycetes, asexual morph unknown, c. 21 species, type species *A. mesenterica* (Dicks.) Pers., widespread, some species edible [*A. auricula-judae* (Bull.) Quél.], see Dai et al. 2010b (edible mushrooms, China), some medicinal use (*A. auricula* (L. ex Hook.) Underw.), see Dai and Yang 2008 (medicinal mushrooms, China), see Kirk et al. 2013 (genus accepted), sequence data available, see Looney et al. 2013 (Southeastern USA, monograph), Malysheva and Bulakh 2014 (Russia, monograph), Wu et al. 2014a (phylogeny), new spp. see Kumari et al. 2013a (North India), Looney et al. 2013 (southeastern USA), Wu et al. 2014a, 2015d, e (USA, China, Brazil), Bandara et al. 2015a, 2017 (Southeastern Asia).

Auriculariopsis Maire 1902, Schizophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *A. ampla* (Lév.) Maire (current name: *Schizophyllum amplum* (Lév.) Nakasone), worldwide, wood decaying, sequence data available, see Binder et al. 2005 (phylogeny), new combination see Ryvarden 2010 (America).

Auriculoscypha D.A. Reid & Manim. 1985, Septobasidiaceae, Septobasidiales, Pucciniomycetes, sexual morph unknown, one species, type species *A. anacardiicola* D.A. Reid & Manim., India, medicinal use, see Puthusseri et al. 2010 (antioxidant and anti-inflammatory properties), see Kirk et al. 2013 (genus accepted), sequence data available, see Kumar et al. 2007 (phylogeny).

Aurificaria D.A. Reid 1963, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, two species, type species *A. indica* (Massee) D.A. Reid, wood-rotting, basidioma pileate to stipitate, poroid hymenophore, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Wagner and Fischer 2002 (phylogeny).

Auriporia Ryvarden 1973, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, four species, type species *A. aurea* (Peck) Ryvarden, basidimes resupinate, poroid hymenophore, wood-rotting, brown rot, widespread (north temperate), see Kirk et al. 2013 (genus accepted), sequence data available, see Justo et al. 2017 (phylogeny, Polyporales).

Auriscalpium Gray 1821, Auriscalpiaceae, Russulales, Agaricomycetes, asexual morph unknown, eight species, type species *A. vulgare* Gray, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Kim et al. 2015 (mushroom flora of Korea).

Auritella Matheny & Bougher 2006, Inocybaceae, Agaricales, Agaricomycetes, asexual morph unknown, eight species, type species *A. dolichocystis* Matheny, Trappe & Bougher ex Matheny & Bougher, Australia, India, ectomycorrhizal, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny and Bougher 2006 (monograph), new spp. see Matheny et al. 2012 (India), Matheny et al. 2017b (Cameroon, worldwide key), Matheny and Bougher 2017 (Australia).

Austeria Miettinen 2016, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *A. citrea* (Berk.) Miettinen, pileate basidioma, poroid hymenophore, wood-rotting, white rot, sequence data available, see Miettinen and Ryvarden 2016 (new genus, new combination, morphology).

Australicium Hjortstam & Ryvarden 2002, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *A. singulare* (G. Cunn.) Hjortstam & Ryvarden, corticioid basidioma, wood-rotting, white rot, widespread (Australia, New Zealand, Venezuela), sequence data unavailable, see Kirk et al. 2008.

Australohydnum Jülich 1978, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *A. griseofuscescens* (Reichardt) Jülich, basidioma resupinate, hymenophore hydnoid, wood-rotting, widespread (Australia, Europe), see Tura et al. 2011 (new record, Israel), Kirk et al. 2013 (genus accepted), sequence data unavailable, see Saitta et al. 2014 (morphology, new record, Italy, *A. dregeanum* (Berk.) Hjortstam & Ryvarden).

Australopilus Halling & N.A. Fechner 2012, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *A. palumanus* (Wolfe & Bougher) Halling & N.A. Fechner, stipitate-pileate, Australia, sequence data available, see Halling et al. 2012b (monograph).

Australoporus P.K. Buchanan & Ryvarden 1988, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *A. tasmanicus* (Berk.) P.K. Buchanan & Ryvarden, poroid hymenophore, wood-rotting, white rot, Australia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Australovuilleminia Ghobad-Nejhad & Hallenb. 2010, Vuilleminiaceae, Corticiales, Agaricomycetes, asexual morph unknown, one species, type species *A. coccinea* Ghobad-Nejhad & Hallenb., saprotroph, wood-rotting, on dead attached twigs and branches of *Nothofagus* in New Zealand, sequence data available, see Ghobad-Nejhad et al. 2010 (phylogeny, *Vuilleminia*, Corticiales).

Austrobasidium Palfner 2006, Exobasidiaceae, Exobasidiales, Exobasidiomycetes, one species, type species *A. pehueldeni* Palfner, plant parasite (stem) on *Hydrangea* spp. (Hydrangeaceae), Chile, cultures unavailable, sequence data unavailable, see Begerow et al. 2014.

Austroboletus (Corner) Wolfe 1980, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 36 species, type species *A. dictyotus* (Boedijn) Wolfe, stipitate-pileate, worldwide, some species edible (*A. gracilis* (Peck) Wolfe), see Dai et al. 2010b (edible mushrooms, China), see Fulgenzi et al. 2010 (new record, Guyana), Kirk et al. 2013 (genus accepted), sequence data available, see Drehmel et al. 2008 (phylogeny, boletes), new spp. see da Marcela Vasco-Palacios et al. 2014 (Colombian Amazonia), Das and Dentinger 2015 (India), Fechner et al. 2017 (Australia).

Austroclitocybe Raithelh. 1972, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *A. veronicae* Raithelh., temperate America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Austrogaster Singer 1962, Paxillaceae, Boletales, Agaricomycetes, asexual morph unknown, four species, type species *A. marthae* Singer, South America (temperate),

New Zealand, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Austrogautieria E.L. Stewart & Trappe 1985, Gallaceaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, seven species, type species *A. macrospora* E.L. Stewart & Trappe, Australia, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2008 (biogeography, Hysterangiales), Truong et al. 2017b (DNA-barcoding).

Austrolentinus Ryvarden 1991, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *A. tenebrosus* (Corner) Ryvarden, hymenophore lamellate, wood-rotting, Australia, Solomon Islands, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Austroomphaliaster Garrido 1988, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *A. nahuelbutensis* Garrido, temperate America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Austropaxillus Bresinsky & Jarosch 1999, Serpulaceae, Boletales, Agaricomycetes, asexual morph unknown, nine species, type species *A. statuum* (Speg.) Bresinsky & Jarosch, ectomycorrhizal, widespread (southern temperate), see Kirk et al. 2013 (genus accepted), sequence data available, see Skrede et al. 2011 (evolution, phylogeny).

Austropuccinia Beenken 2017, Sphaerophragmiaceae, Pucciniales, Pucciniomycetes, one species, type species *A. psidii* (G. Winter) Beenken (asexual morph *Uredo psidii* J.A. Simpson, K. Thomas & Grgur.), biotrophic on Myrtaceae, terrestrial, Australia, Brazil, China, USA, Hawaii, Japan, Mexico, New Caledonia, New Zealand, South Africa, South America, sequence data available, see Tan et al. 2014 (phylogeny), Machado et al. 2015 (epitypification), Beenken 2017 (distribution, morphology, phylogeny). Several authors (e.g., Sandhu et al. 2016) assume that the myrtle rust is a species complex, future research will show how many species exist in the genus.

Baeodromus Arthur 1905, Pucciniosiraceae, Pucciniales, Pucciniomycetes, six species, type species *B. holwayi* Arthur, biotrophic on Asteraceae, Ranunculaceae, Urticaceae, terrestrial, China, Central America, North America, South America, Russia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Baeospora Singer 1938, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, 13 species, type species *B. myosura* (Fr.) Singer, North temperate, tropical, snowbank agaric, saprobic, see Hutchison et al. 2012 (morphology, new spp.), Kirk et al. 2013 (genus accepted), sequence data available, see Walther et al. 2005 (phylogeny, conidiogenesis modes).

Ballistosporomyces Nakase, G. Okada & Sugiy. 1989, Chionosphaeraceae, Agaricostilbales, Agaricostilbomycetes, sexual morph unknown, four species, type species *B. xanthus* Nakase, G. Okada & Sugiy., yeast, Japan, see Kirk et al. 2013 (genus accepted), Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Wang et al. 2015e (phylogenetic classification of yeasts, Pucciniomycotina), new spp. see Han et al. 2016b (China).

Baltazaria Leal-Dutra, Dentinger & G.W. Griff. 2018, Peniophoraceae, Russulales, Agaricomycetes, asexual morph unknown, four species, type species *B. galactina* (Fr.) Leal-Dutra, Dentinger & G.W. Griff., corticioid, wood-rotting, worldwide, sequence data available, see Leal-Dutra et al. 2018 (taxonomy and phylogeny).

Bambusiomyces Vánky 2011, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, one species, type species *B. shiraianus* (Henn.) Vánky, plant parasite on woody bamboos (Bambuseae, Poaceae), South East Asia, cultures unavailable, sequence data unavailable, see Vánky 2011 (taxonomy), McTaggart et al. 2012a (taxonomy).

Bandonia A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Tetragoniomycetaceae, Trichosporonales, Tremellomycetes, sexual morph unknown, one species, type species *B. marina* (Uden & Zobell) A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, aquatic, worldwide, sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Bankera Coker & Beers ex Pouzar 1955, Bankeraceae, Thelephorales, Agaricomycetes, asexual morph unknown, eight species, type species *B. fuligineoalba* (J.C. Schmidt) Coker & Beers ex Pouzar, worldwide, on soil, basidioma stipitate, hymenophore hydnoid, see Kirk et al. 2013 (genus accepted), sequence data available.

Bannoa Hamam. 2002, Erythrobasidiaceae, Erythrobasidiales, Cystobasidiomycetes, sexual and asexual morphs known, four species, type species *B. hahajimensis* Hamam., Thanh & Nakase, yeast, isolated from plant material, Japan, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Wang et al. 2015e (emended, phylogeny).

Bannozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, Chrysozymaceae, *incertae sedis*, Microbotryomycetes, sexual morph unknown, two species, type species *B. yamatoana* (Nakase, M. Suzuki & M. Itoh) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, psychrophilic, Arctic, Japan, cultures and sequence data available, see Wang et al. 2015e (taxonomy, phylogeny).

Baorangia G. Wu & Zhu L. Yang 2015, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, four species, type species *B. pseudocalopus* (Hongo) G. Wu & Zhu L. Yang, ectomycorrhizal, stipitate-pileate, China, Japan, North America, sequence data available, see Wu et al. 2016e (taxonomy).

Barcheria T. Lebel 2004, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *B. willisiana* T. Lebel, Australia, sequence data available, see Lebel et al. 2004 (monograph).

Bartheletia G. Arnaud ex Scheuer, R. Bauer, M. Lutz, Stabenth., Melnik & Grube 2008, *incertae sedis*, *incertae sedis*, Basidiomycota, one species, type species *B. paradoxa* G. Arnaud ex Scheuer, R. Bauer, M. Lutz, Stabenth., Melnik & Grube, Austria, Denmark, France, Germany, Russia, Sweden, The Netherlands, United Kingdom, Korea, Japan, living on ginkgo, see Kirschner and Okuda 2013 (new record, Japan), sequence data available, see Scheuer et al. 2008 (monograph).

Basidioascus Matsush. 2003, Geminibasidiaceae, Geminibasidiales, Wallemiomycetes, asexual morph unknown, three species, type species *B. undulatus* Matsush., Australia, sequence data available, see Nguyen et al. 2013a (phylogeny, new sp.), Nasr et al. 2014b (new sp., Iran).

Basidiodendron Rick 1938, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, c. 15 species, type species *B. luteogriseum* Rick, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Sotome et al. 2014 (Asian species, poroid Auriculariales, phylogeny).

Basidiopycnis Oberw., R. Kirschner, R. Bauer, Begerow & Arenal 2006, Hoehnelomycetaceae, Atractiellales, Atractiellomycetes, synonyms *Basidiopycnides albertensis* J. Reid, Eyjólfsd. & Georg Hausner 2008, asexual morph known, one species, type species *B. hyaline* Oberw., R. Kirschner, R. Bauer, Begerow & Arenal, presumably mycophilic but nature of association unknown, in bark beetle galleries in dead wood of conifers, Europe and North America, see Oberwinkler et al. 2006 (integrated taxonomy), Kischner and Oberwinkler 2009 (integrated taxonomy), sequence data available, see Aime et al. 2018c (phylogeny).

Basidioradulum Nobles 1967, Schizoporaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *B. radula* (Fr.) Nobles, basidioma resupinate, hymenophore raduloid or hydnoid, wood-rotting, Europe, North America, see Kirk et al. 2013 (genus accepted), sequence data available, see Weiß and Oberwinkler 2001 (phylogeny).

Battarrea Pers. 1801, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *B. phalloides* (Dicks.) Pers., worldwide, terrestrial, saprobic, see Kirk et al. 2013 (genus accepted), sequence data available, see Martín and Johannesson 2000 (phylogeny, Europe), Martín et al. 2013b (phylogeny), Ivančević et al. 2016 (taxonomy, worldwide review).

Battarreoides T. Herrera 1953, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *B. potosinus* T. Herrera (current name: *B. diguetii* (Pat. & Har.) R. Heim & T. Herrera), America (deserts), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Bauerago Vánky 1999, Microbotryaceae, Microbotryales, Microbotryomycetes, nine species, type species *B. abstrusa* (Malençon) Vánky, worldwide, biotrophic in seeds of Commelinaceae, Cyperaceae, Juncaceae, see Kirk et al. 2013 (genus accepted), Denchev and Denchev 2018 (taxonomic re-examination, Africa), sequence data available, see Kemler et al. 2006, 2009 (phylogeny, Microbotryaceae, non-caryophyllaceous plant-parasitic species, *Microbotryum*).

Beenakia D.A. Reid 1956, Clavariadelphaceae, Gomphales, Agaricomycetes, asexual morph unknown, seven species, type species *B. dacostae* D.A. Reid, wood-decaying, widespread (tropical), see Kirk et al. 2013 (genus accepted), sequence data available, see Giachini et al. 2010 (phylogeny, Gomphales).

Bensingtonia Ingold 1986, Kondoacea, Agaricostilbales, Agaricostilbomycetes, sexual morph unknown, five species, type species *B. ciliata* Ingold, yeast, worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Wang et al. 2015e (taxonomy and phylogeny).

Biatoropsis Räsänen 1934, *incertae sedis*, Tremellales, Tremellomycetes, asexual morph unknown, four species, type species *B. usnearum* Räsänen, lichenicolous, worldwide, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Bibulocystis J. Walker, Beilharz, Pascoe & Priest 2006, Raveneliaceae, Pucciniales, Pucciniomycetes, three species, type species *B. pulcherrima* J. Walker, Beilharz, Pascoe & Priest, Australia, New Caledonia, sequence data unavailable, new sp. see Walker and Shivas 2009 (morphology, Australia).

Binderoboletus T.W. Henkel & M.E. Sm. 2016, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *B. segoi* T.W. Henkel & Husbands, stipitate-pileate, presumably ectomycorrhizal, South America, DNA sequence data available, see Henkel et al. 2016 (taxonomy).

Bjerkandera P. Karst. 1879, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *B. adusta* (Willd.) P. Karst., basidioma pilate, hymenophore poroid, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Jung et al. 2014 (sequence validation), Westphalen et al. 2015 (new sp., new combination, phylogeny, Central and South America), Ryvarden 2016b (new sp., morphology, tropical America), Zmitrovich and Kovalenko 2016 (Russia, intraspecies polymorphism).

Blasiphalia Redhead 2007, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, one species, type species *B. pseudogrisella* (A.H. Sm.) Redhead, USA, sequence data unavailable, see Kirk et al. 2008.

Blastospora Dietel 1908 (= *Pelastoma*), Mikronegeriaceae, Pucciniales, Pucciniomycetes, five species, type species *B. smilacis* Dietel, asexual morphs *Caeoma* Link 1809, *Pelastoma* M. Salazar, A.A. Carvalho & J.F. Hennen 2012, biotrophic on Apocynaceae, Betulaceae, Smilacaceae, terrestrial, Central and South America, Japan, see Yepes and de Carvalho 2012 (new combination, asexual morph), Kirk et al. 2013 (genus accepted), sequence data available, see Aime 2006 (phylogeny, family-level, Uredinales).

Blastosporella T.J. Baroni & Franco-Mol. 2007, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *B. zonata* T.J. Baroni & Franco-Mol., Colombia, sequence data available, see Baroni et al. 2007 (taxonomy).

Blumenavia Möller 1895, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, three species, type species *B. rhacodes* Möller, terrestrial, south America; Africa, see Kirk et al. 2013 (genus accepted), sequence data available, see Degreef et al. 2013 (morphology), Trierveiler-Pereira et al. 2014a (phylogeny, morphology).

Bogbodia Redhead 2013, Strophariaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *B. uda* (Pers.) Redhead, worldwide, sequence data unavailable, see Redhead 2013a (taxonomy).

Boidinella Nakasone 2011, *incertae sedis*, Cantharellales, Agaricomycetes, asexual morph unknown, two species, type species *B. globulispora* (Boidin & Lanq.) Nakasone, wood-decaying, Europe, sequence data unavailable, see Nakasone 2011 (taxonomy, morphology).

Boidinia Stalpers & Hjortstam 1982, Russulaceae, Russulales, Agaricomycetes, asexual morph unknown, eleven species, type species *B. furfuracea* (Bres.) Stalpers & Hjortstam, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Larsson 2003 (phylogeny), new spp. see Adamčík et al. 2015 (China).

Bolbitius Fr. 1838, Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 70 species, type species *B. titubans* (Bull.) Fr., worldwide, saprobic, dung fungi, see Kirk et al. 2013 (genus accepted), sequence data available, see Amandeep et al. 2013 (India), Malysheva et al. 2015a (taxonomic revision, Russia), new spp. see Hausknecht et al. 2008 (Italy), Dähncke et al. 2010 (Spain), Crous et al. 2015a (new sp., phylogeny).

Boletellus Murrill 1909, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 50 species, type species *B. ananas* (M.A. Curtis) Murrill, stipitate-pileate, ectomycorrhizal, worldwide (mostly subtropical to tropical), some species edible see Boa 2004, see Kirk et al. 2013 (genus accepted), DNA sequence data available, see Halling and Ortiz-Santana 2009 (revision of sect. *Ixocephali*), Halling et al. 2015 (phylogeny, new spp. and combinations), new spp. see Fulgenzi et al. 2008 (Guyana), Mayor et al. 2008 (Guyana), Sato and Hattori 2015 (Japan), Wu et al. 2016f (China), Parihar et al. 2018a (India).

Boletinellus Murrill 1909, Boletinellaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *B. merulioides* (Schwein.) Murrill, North America, Japan, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2006 (Agaricales, phylogeny).

Boletochaete Singer 1944, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, five species, type species *B. spinifera* (Pat. & C.F. Baker) Singer, stipitate-pileate, ectomycorrhizal, Souteast Asia, see Kirk et al. 2013 (genus accepted), sequence data unavailable, see Horak 2011 (new combinations).

Boletopsis Fayod 1889, Bankeraceae, Thelephorales, Agaricomycetes, asexual morph unknown, ten species, type species *B. leucomelaena* (Pers.) Fayod, worldwide, terrestrial, some species edible [*B. grisea* (Peck) Bondartsev & Singer], see Dai et al. 2010b (edible mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Watling and Milne 2008 (European, North American), new spp. see Cooper and Leonard 2012 (Southern Hemisphere).

Boletus L. 1753, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 350 species, type species *B. edulis* Bull., terrestrial, ectomycorrhizal, some stipitate-pileate, others are sequestrate, porcini mushrooms, some species edible, King bolete (*B. edulis* Bull.), see Drehmel et al. 2008 (phylogeny, biodiversity, boletes), Sarikurkcu et al. 2008 (antioxidant activity), Dai et al. 2010b (edible mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Beugelsdijk et al. 2008 (Europe, phylogeny, *Boletus* section *Boletus*), Dentinger et al. 2010 (*Boletus* section *Boletus*, monograph), Nuhn et al. 2013 (phylogeny, Boletaceae), Cui et al. 2016 (Porcini mushrooms, *Boletus* sect. *Boletus*, China), new spp. see Arora 2008 (California, USA), Korhonen et al. 2009 (Fennoscandia), Ortiz-Santana et al. 2009a, b (North America, Gulf Coast, Northern Florida), Takahashi et al. 2011 (Japan), Blanco-Dios and Marques 2013 (coastal dunes of Northwest Spain), Gelardi et al. 2013a (China), Nuhn et al. 2013 (New Zealand), Takahashi et al. 2013 (Japan), Arora and Frank 2014a (USA), Halling et al. 2014 (Thailand, Australia), Li et al. 2014a (China), Šutara et al. 2014 (Czech Republic), Zeng et al. 2014 (China), Chakraborty et al. 2015 (India), Das and Dentinger 2015 (India), Cui et al. 2016 (China), Terashima et al. 2016 (Japan), Chakraborty et al. 2017b (India).

Bondarcevomyces Parmasto 1999, Tapinellaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *B. taxi* (Bondartsev) Parmasto, Asia, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2010 (phylogeny).

Bondarzewia Singer 1940, Bondarzewiaceae, Russulales, Agaricomycetes, asexual morph unknown, 14 species, type species *B. montana* (Quél.) Singer, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Chen et al. 2016e (phylogeny), Song et al. 2016c (phylogeny, biogeography), new spp. see Dai et al. 2010a (China), Das et al. 2015a (India).

Boninogaster Kobayasi 1937, *incertae sedis*, Geastrales, Agaricomycetes, asexual morph unknown, one species, type species *B. phalloides* Kobayasi, Bonin islands, Japan, see Kirk et al. 2013 (genus accepted), sequence data available.

Bonomyces Vizzini 2014, Pseudoclitocybaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *B. sinopicus* (Fr.) Vizzini, worldwide, agaricoid, see Vizzini 2014b (taxonomy), sequence data available, see Alvarado et al. 2018a, b (phylogeny).

Boreostereum Parmasto 1968, Gloeophyllaceae, Gloeophyllales, Agaricomycetes, asexual morph unknown, four species, type species *B. radiatum* (Peck) Parmasto, widespread (north temperate), brown rot, wood-rotting, see Kirk et al. 2013 (genus accepted), Chen et al. 2016a (novel natural compounds), sequence data available, see Garcia-Sandoval et al. 2011 (phylogeny).

Borofutus Hosen & Zhu L. Yang 2012, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *B. dhakanus* Hosen & Zhu L. Yang, stipitate-pileate, presumably ectomycorrhizal, Asia (tropical), sequence data available, see Hosen et al. 2013 (morphology, taxonomy, phylogeny), Vadthanarat et al. 2018 (phylogeny, Thailand).

Bothia Halling, T.J. Baroni & Manfr. Binder 2007, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *B. castanella* (Peck) Halling, T.J. Baroni & Manfr. Binder, stipitate-pileate, ectomycorrhizal, North America, Asia, sequence data available, new spp. see Zeng et al. 2015 (China).

Botryobasidium Donk 1931 (= *Haplotrichum* Link *fide* Rossman et al. 2016), Botryobasidiaceae, Cantharellales, Agaricomycetes, asexual morph described as *Haplotrichum* spp., c. 58 species, type species *B. subcoronatum* (Höhn. & Litsch.) Donk, saprotrophic, widespread, see Kirk et al. 2013 (genus accepted), McLaughlin and Spatafora 2014 (overview of genus), Rossman et al. 2016 (although *Haplotrichum* is the older name, *Botryobasidium* is proposed for protection due to its size and popularity), sequence data available, see Brazee et al. 2014 (ecology), Rosenthal et al. 2017 (ecology, corticioid fungi in North American pinaceous forests), new spp. see Bernicchia et al. 2010 (Italy), Buyck et al. 2017 (Africa).

Botryoconis Syd. & P. Syd. 1906, Cryptobasidiaceae, Exobasidiales, Exobasidiomycetes, two species, type species *B. saccardoi* Syd. & P. Syd., plant parasites (leaves, stem, fruits) on Lauraceae, Central and South America, cultures unavailable, see Kirk et al. 2013 (genus accepted), sequence data unavailable, see Begerow et al. 2002, 2014 (taxonomy).

Botryodontia (Hjortstam & Ryvarden) Hjortstam 1987, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, six species, type species *B. cirrata* (Hjortstam & Ryvarden) Hjortstam, wood-decaying, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Sell et al. 2014 (*B. millavensis* and *Oxyporus philadelphi* are conspecific).

Botryorhiza Whetzel & Olive 1917, Chaconiaceae, Pucciniales, Pucciniomycetes, one species, type species *B. hippocrateae* Whetzel & Olive, biotrophic on Hippocrateaceae, terrestrial, Brazil, Puerto Rico, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Bourdotia (Bres.) Bres. & Torrend 1913, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *B. galzinii* (Bres.) Trotter, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Sotome et al. 2014 (Asian species, poroid Auriculariales, phylogeny).

Bourdotiella Duhem & Schultheis 2011, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *B. complicata* Duhem & Schultheis, corticioid basidioma, wood-rotting, France, sequence data unavailable, see Bernard and Schultheis 2011 (new genus, new species, morphology).

Bourdotigloea Aime 2018, Phleogenaceae, Atractiellales, Atractiellomycetes, asexual morph unknown, c. nine species, type species *B. vestita* (Bourdot & Galzin) Aime, presumably saprobic, on decaying wood, decaying herbaceous material and old fungi, Europe and North America, sequence data available, see Aime et al. 2018c (taxonomy, phylogeny), Spirin et al. 2018c (phylogeny, new spp.).

Bovista Pers. 1794, Lycoperdaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 58 species, type species *B. plumbea* Pers., two subgenera *Globaria* and *Bovista*, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Jeppson 2008 (phylogeny, Europe), Larsson et al. 2009a (phylogeny, Europe), new spp. see Trierveiler-Pereira et al. 2010 (Brazil), Yousaf et al. 2013 (Pakistan), Jeppson et al. 2016 (Hungary), Rebriev et al. 2017 (Russia), Trierveiler-Pereira et al. 2018 (Brazil).

Brachybasidium Gäum. 1922, Brachybasidiaceae, Exobasidiales, Exobasidiomycetes, asexual morph unknown, one species, type species *B. pinangae* (Racib.) Gäum., plant

parasites (leaves) on *Pinanga* spp. (Arecaceae), West Java, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data unavailable, see Begerow et al. 2002, 2014 (taxonomy).

Brauniella Rick ex Singer 1955, Strophariaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *B. alba* (Rick) Rick ex Singer, America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Bresadolia Speg. 1883, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, four species, type species *B. paradoxa* Speg., on dead wood, white rot, tropical to warm-temperate, sequence data available, see Motato-Vásquez et al. 2018 (genus accepted, phylogeny, taxonomy).

Brevicellicium K.H. Larss. & Hjortstam 1978, Hydnodontaceae, Trechisporales, Agaricomycetes, asexual morph unknown, 13 species, type species *B. exile* (H.S. Jacks.) K.H. Larss. & Hjortstam, wood-decaying, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Sjökvist et al. 2012 (evolution), Telleria et al. 2013a (phylogeny).

Brevicellopsis Hjortstam & Ryvarden 2008, *incertae sedis*, *incertae sedis*, Basidiomycota, asexual morph unknown, one species, type species *B. allantospora* (Hjortstam & Ryvarden) Hjortstam & Ryvarden, worldwide, sequence data unavailable, see Hjortstam and Ryvarden 2008b (taxonomy).

Bridgeoporus T.J. Volk, Burds. & Ammirati 1996, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, two species, type species *B. nobilissimus* (W.B. Cooke) T.J. Volk, Burds. & Ammirati, USA, basidioma pileate, hymenophore poroid, wood-rotting, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Wu et al. 2017a (China).

Broomeia Berk. 1844, Broomeiaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *B. congregata* Berk., Americas, Asia, sequence data unavailable, see Lugo et al. 2012 (morphology, new record, Argentina), Kirk et al. 2013 (genus accepted).

Brunneocorticium Sheng H. Wu 2007, Marasmiaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *B. pyriforme* Sheng H. Wu, China, sequence data available, see Wu et al. 2007 (taxonomy).

Brunneoporus Audet 2017, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *B. malicola* (Berk. & M.A. Curtis) Audet, wood-rotting, sequence data available, see Audet 2017b (taxonomy).

Bryoperdon Vizzini 2017, Lycoperdaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *B. acuminatum* (Bosc) Vizzini, sequence data available, see Vizzini and Ercole 2017 (phylogeny, taxonomy).

Buchwaldoboletus Pilát 1969, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, eleven species, type species *B. lignicola* (Kallenb.) Pilát, stipitate-pileate, lignicolous and mycoparasitic see Nuhn et al. 2013, worldwide, see Ortiz-Santana and Both 2011 (review with new combinations), Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Blanco-Dios and Marques 2013 (Europe).

Buckleyzyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, Buckleyzymaceae, Buckleyzymales, Cystobasidiomycetes, sexual morph unknown, five species, type species *B. aurantiaca* (Saito) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, worldwide, cultures and sequence data available, see Wang et al. 2015e (taxonomy, phylogeny).

Buglossoporus Kotl. & Pouzar 1966, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, nine species, type species *B. quercinus* (Schrad.) Kotl. & Pouzar, hymenophore poroid, wood-rotting, brown rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Han et al. 2016a (new sp., phylogeny, China).

Bulbilla Diederich, Flakus & Etayo 2014 [= *Adamflakia* Diederich & Lawrey nom. inval. et nom. illeg. superfl.], *incertae sedis*, Cantharellales, Agaricomycetes, only asexual morph known (bulbil-forming), one species, type species *B. applanata* Diederich, Flakus & Etayo [= *Adamflakia applanata* (Diederich, Flakus & Etayo) Diederich & Lawrey, nom. inval.], sequence data available, see Diederich et al. 2014 (new sp., phylogeny).

The new name *Adamflakia* was introduced by Lawrey et al. (2016) for *Bulbilla* because these authors believed that the latter generic name was not validly published following Art. 20.2 (ICN), stating that it "coincides with a Latin technical term in use in morphology". As a consequence, the names *Adamflakia* and *A. applanata* (as "*A. applanata* Diederich & Lawrey") were recently accepted in the world-wide checklist of lichenicolous fungi (Diederich et al. 2018a). However, *Bulbilla* was actually validly published because it is not a morphological term. In the case of the term "bulbil" there is no corresponding "bulbilla" in use for this morphological structure in Latin. The Latin term would be "bulbillus" and thus only the exact spelling "*Bulbillus*" is not allowed following Art. 20.2. A similar case exists for the genus *Spinulum* in lycopods. The Latin term would be "spinula", but because the generic name ends with "-um", and not "-a", the fern community considers it as valid (PPG I 2016, p. 570; see also discussion on http://www.fernsoftheworld.com/2014/01/02/spinulum-annotinum/) and Art. 20.2 does not to apply here too. In addition, the genus *Adamflakia* was invalidly published

(Art. 40.1 (Melbourne)) because the type of *Adamflakia* should have been cited as *A. applanata* (not *B. applanata*). As a result of the genus not being validly published, the species *Adamflakia applanata* is invalid too because it was published in an invalidly published genus (Art. 35.1). Because *Bulbilla* was validly published, *Adamflakia* is both invalid (because it wasn't validly published) and illegitimate (because it was a superfluous renaming since *Bulbilla* was available, valid and legitimate), and *A. applanata* is invalid (since the genus was invalid, the species cannot be validly combined).

Bulbillomyces Jülich 1974, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph *Aegerita* Pers. 1794, one species, type species *B. farinosus* (Bres.) Jülich, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson 2007b (phylogeny, *Hyphoderma*), Justo et al. 2017 (phylogeny, Polyporales).

Bullera Derx 1930, Bulleraceae, Tremellales, Tremellomycetes, sexual and asexual morphs known, four species, type species *B. alba* (W.F. Hanna) Derx, yeast, possibly mycoparasite, plant material, worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, Liu et al. 2015b (taxonomy and phylogeny).

Bulleribasidium J.P. Samp., M. Weiss & R. Bauer 2002, Bulleribasidiaceae, Tremellales, Tremellomycetes, sexual and asexual morphs known, eleven species, type species *B. oberjochense* J.P. Samp., Gadanho, M. Weiss & R. Bauer, yeast, possibly mycoparasite, widespread, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Burgella Diederich & Lawrey 2007, Hydnaceae, Cantharellales, Agaricomycetes, only asexual morph known (bulbil-forming), two species, type species *B. flavoparmeliae* Diederich & Lawrey, North and South America, sequence data available, see Diederich et al. 2014 (new spp., phylogeny).

Burgellopsis Diederich & Lawrey 2014, Hydnaceae, Cantharellales, Agaricomycetes, only asexual morph known (bulbil-forming), one species, type species *B. nivea* Diederich & Lawrey, Scotland, sequence data available, see Diederich et al. 2014 (new spp., phylogeny), Lawrey et al. 2016 (phylogeny).

Burgoa Goid. 1937, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph known (bulbil-forming), nine species, type species *B. verzuoliana* Goid., propagules bulbils, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Diederich and Lawrey 2007 (new sp.), Kiyuna et al. 2015 (Japan, ecology).

Burrillia Setch. 1891, Doassansiaceae, Doassansiales, Exobasidiomycetes, four species, type species *B. pustulata* Setch., plant parasites on monocots (Alismataceae, Pontederiaceae), South and East Asia, North America, India, cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Butlerelfia Weresub & Illman 1980, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, one species, type species *B. eustacei* Weresub & Illman, Canada, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Vu et al. 2019 (DNA barcodes).

Butyrea Miettinen 2016, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *B. luteoalba* (P. Karst.) Miettinen, resupinate basidioma, poroid hymenophore, wood-rotting, widespread (northern Europe, Asia), sequence data available, see Miettinen et al. 2012 (phylogeny), Miettinen and Ryvarden 2016 (new genus, new combinations, phylogeny), Zmitrovich et al. 2018a (taxonomy).

Butyriboletus Arora & J.L. Frank 2014, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 25 species, type species *B. appendiculatus* (Schaeff.) D. Arora & J.L. Frank, stipitate-pileate, ectomycorrhizal, worldwide, some species edible, see Boa 2004 (wild edible fungi), sequence data available, see Arora and Frank 2014b (phylogeny, new spp. and combinations), new spp. see Liang et al. 2016 (China), Wu et al. 2016f (China), new combinations see Zhao et al. 2015d.

Byssocorticium Bondartsev & Singer 1944, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, eleven species, type species *B. atrovirens* (Fr.) Bondartsev & Singer, ectomycorrhizal, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Palmer et al. 2008 (ectomycorrhizal), Zmitrovich 2008 (species manual), Bahram et al. 2012 (ectomycorrhizal fungal diversity), Pickles et al. 2012 (ecology), Gao et al. 2013a (ecology), Miyamoto et al. 2014 (ectomycorrhizal fungus), new spp. see Kotiranta et al. 2011 (Finland), Dhingra 2014 (diversity, Himalaya and adjoining areas).

Byssomerulius Parmasto 1967, Irpicaceae, Polyporales, Agaricomycetes, asexual morph unknown, eight species, type species *B. corium* (Pers.) Parmasto, basidioma merulioid, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2004 (phylogeny, corticioid homobasidiomycetes), Jang et al. 2016 (Korea), new combination see Tura et al. 2011 (morphology, Israel), Justo et al. 2017 (Phylogeny, Polyporales).

Byssoporia M.J. Larsen & Zak 1978, Albatrellaceae, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *B. terrestris* (DC.) M.J. Larsen & Zak, mycorrhizal, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson 2007a (corticioid fungi, phylogeny).

Cabalodontia Piątek 2004, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *C. queletii* (Bourdot & Galzin) Piątek,

resupinate basidioma, varied hymenophore (ceraceous to subgelatinous, odontoid, tuberculate, smooth), wood-rotting, widespread (Northern Hemisphere), sequence data available, see Rosenthal et al. 2017 (ecology, corticioid fungi in North American pinaceous forests).

Caeoma Link 1809 (= *Hypodermium* Link 1815), *incertae sedis*, Pucciniales, Pucciniomycetes, asexual morph particularly of *Arthuria* H.S. Jacks., *Chrysocelis* Lagerh. & Dietel, *Gymnoconia* Lagerh., *Melampsora* Castagne, *Polioma* Arthur, c. 50 species, type species *C. berberidis* (Pers.) Har. (current name: *Puccinia graminis* Pers.), biotrophic on various families, terrestrial, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Aime et al. 2018a (phylogeny, evolution with host, Pucciniales), new spp. see Yepes and Céspedes 2008, Afshan et al. 2012 (morphology, Pakistan), Savchenko et al. 2014 (morphology, rust fungi, Israel).

Caeruleomyces Stalpers 2000, *incertae sedis*, Hymenochaetales, Agaricomycetes, sexual morph Hymenochaetales, one species, type species *C. verae* Stalpers, wood-decaying, sequence data unavailable, see Kirk et al. 2008.

Caetea Salazar-Yepes & A.A. Carvalho 2012, *incertae sedis*, Pucciniales, Pucciniomycetes, one species, type species *C. itatiaiaensis* Salazar-Yepes & A.A. Carvalho, biotrophic on Fabaceae (*Piptadenia*), terrestrial, Brazil, see Yepes and de Carvalho 2012 (taxonomy).

Calbovista Morse ex M.T. Seidl 1995, Lycoperdaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. subsculpta* Morse ex M.T. Seidl, USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Calcipostia B.K. Cui, L.L. Shen & Y.C. Dai 2019, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *C. guttulata* (Sacc.) B.K. Cui, L.L. Shen & Y.C. Dai, China, Europe, USA, wood-rotting, sequence data available, see Shen et al. 2019 (taxonomy, phylogeny).

Calidion Syd. & P. Syd. 1919 [1918], Uncolaceae, Pucciniales, Pucciniomycetes, four species, type species *C. lindsaeae* (Henn.) Syd. & P. Syd., biotrophic on Bombacaceae, Polypodiaceae, terrestrial, Brazil, Colombia, Asia (China, India, Sri Lanka), see Kirk et al. 2013 (genus accepted), sequence data unavailable, new spp. see Yepes and Céspedes 2008, Silva et al. 2009 (new combination, new host record, Brazil).

Callistodermatium Singer 1981, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. violascens* Singer, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Callistosporium Singer 1944, Biannulariaceae, Agaricales, Agaricomycetes, asexual morph unknown, 14 species, type species *C. palmarum* (Murrill) Singer, saprobic, wood-decaying or on soil, worldwide, see Antonín et al. 2009 (Czech, ecology), Kirk et al. 2013 (genus accepted), sequence data available, see Hofstetter et al. 2014 (phylogeny, Lyophyllaceae), Saba and Khalid 2014 (Pakistan), Sánchez-García et al. 2014, 2017 (phylogeny, evolution), new spp. see Desjardin and Hemmes 2011 (Hawaii), Desjardin and Perry 2017 (São Tomé and Príncipe, West Africa).

Caloboletus Vizzini 2014, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, 14 species, type species *C. calopus* (Pers.) Vizzini, stipitate-pileate, ectomycorrhizal, worldwide, see Vizzini 2014b, sequence data available, see Zhao et al. 2014d (phylogeny and new spp., Asia).

Calocera (Fr.) Fr. 1828, Dacrymycetaceae, Dacrymycetales, Dacrymycetes, asexual morph unknown, 18 species, type species *C. viscosa* (Pers.) Fr., wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Nagy et al. 2015 (genome, evolution), new spp. see Wu et al. 2011b (China), Shirouzu et al. 2013a (Amazonia).

Calocybe Kühner ex Donk 1962, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 46 species, type species *C. gambos*a (Fr.) Donk, worldwide, some species edible (*C. indica* Purkay. & A. Chandra), see Alam et al. 2008 (nutritional analysis), Dai et al. 2010b (Chinese edible mushrooms), Kirk et al. 2013 (genus accepted), sequence data available, see Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Bellanger et al. 2015 (phylogeny), new spp. see Floriani and Vizzini 2016 (Italy), Corriol et al. 2017 (France), Li et al. 2017a (China).

Calocybella Vizzini, Consiglio & Setti 2015, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *C. pudica* (Bon & Contu) Vizzini, Consiglio & Setti, Italy, France, Spain, India, Dominican Republic, sequence data available, see Vizzini et al. 2015a (monograph), new spp. see Latha et al. 2016b (India), Vizzini et al. 2017 (Dominican Republic).

Calostoma Desv. 1809, Calostomataceae, Boletales, Agaricomycetes, asexual morph unknown, 16 species, type species *C. cinnabarinum* Desv., ectomycorrhizal, widespread, see Wilson et al. 2012a (ecology), some species edible, yemitas (*C. cinnabarina* Desv.), see Bautista-Nava and Moreno-Fuentes 2009 (*C. cinnabarina*), some species medicinal use (*C. japonica* Henn.), see Dai and Yang 2008 (medicinal mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Wilson 2009 (Sclerodermatineae, ecology, evolution), Wilson et al. 2012a (phylogeny, Sclerodermatineae), Trierveiler-Pereira et al. 2013 (Costa Rica, monograph), new spp. see Deng and Wu 2014 (South China).

Calvarula Zeller 1939, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type

species *C. excavata* Zeller, terrestrial, America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Calvatia Fr. 1849 (= *Langermannia* Rostk. 1839), Lycoperdaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 43 species, type species *C. craniiformis* (Schwein.) Fr., two subgenera: *Calvatia* Fr. and *Langermannia* (Rostk.) Jeppson & E. Larss., see Larsson and Jeppson 2008, worldwide, terrestrial, saprobic, some species edible (*C. lilacina* (Mont. & Berk.) Henn.), see Coetze and van Wyk 2009 (ethnomycology), Dai et al. 2010b (Chinese edible mushrooms), Wu et al. 2011a (compounds), Coetzee and Van Wyk 2012 (nomenclatural notes), Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Jeppson 2008 (North Europe, phylogeny), Bates et al. 2009 (key, phylogeny), new sp. see Suárez et al. 2009 (Brazil), Alves and Cortez 2013a (Brazil), Rebriev 2013 (Vietnam), Alfredo et al. 2014a (Brazil), Gunasekaran et al. 2018 (India, new sp., distribution data).

Calvatiopsis Hollós 1929, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. bovistoides* Hollós, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Calyptella Quél. 1886, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, 20 species, type species *C. capula* (Holmsk.) Quél., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Bodensteiner et al. 2004 (phylogeny, cyphelloid homobasidiomycetes).

Camarophyllopsis Herink 1958, Clavariaceae, Agaricales, Agaricomycetes, asexual morph unknown, 26 species, type species *C. schulzeri* (Bres.) Herink, worldwide, biotrophic, saprobic, see Kirk et al. 2013 (genus accepted), sequence data available, see Birkebak et al. 2013, 2016 (ecology, Clavariaceae, phylogeny, taxonomy).

Campanella Henn. 1895, Marasmiaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 39 species, type species *C. buettneri* Henn., pleurotoid habit with vein or ridge-like anastomosing lamellae, worldwide, see Bougher 2007 (Western Australia), Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Vinnere et al. 2005 (phylogeny, pathogen), Desjardin et al. 2017 (type study), new spp. see Farook and Manimohan 2014 (India), Desjardin and Perry 2017 (São Tomé and Príncipe, Africa).

Campanophyllum Cifuentes & R.H. Petersen 2003, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. proboscideum* (Fr.) Cifuentes & R.H. Petersen, America, sequence data available, see Cifuentes et al. 2003 (taxonomy).

Campanulospora Salazar-Yepes, Pardo-Card. & Buriticá 2007, Phragmidiaceae, Pucciniales, Pucciniomycetes, one species, type species *C. rubi* Salazar-Yepes, Pardo-Card. & Buriticá, anamorph of *Gerwasia*, biotrophic on Rosaceae (*Rubus*), terrestrial, Ecuador, sequence data unavailable.

Camptobasidium Marvanová & Suberkr. 1990 (= *Crucella* Marvanová & Suberkr. 1990 *fide* Art. 59.1), Camptobasidiaceae, Kriegeriales, Microbotryomycetes, sexual morph unknown, one species, type species *C. hydrophilum* Marvanová & Suberkr., USA, yeast, aquatic, see Kirk et al. 2013 (genus accepted), cultures and sequence data available, see Sampaio et al. 2003 (phylogeny), Wang et al. 2015e (phylogeny).

Campylomyces Nakasone 2004, Gloeophyllaceae, Gloeophyllales, Agaricomycetes, asexual morph unknown, two species, type species *C. tabacinus* (Cooke) Nakasone, Australia, Morocco, sequence data unavailable, see Kirk et al. 2008.

Canasta A.A. Carvalho & J.F. Hennen 2010, Uropyxidaceae, Pucciniales, Pucciniomycetes, three species, type species *C. cruscula* A.A. Carvalho & J.F. Hennen, biotrophic on Bignoniaceae, terrestrial, warmer areas of Central and South America, asexual stage of *Prospodium*, see de Carvalho and Hennen 2010 (taxonomy).

Candelabrochaete Boidin 1970, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, twelve species, type species *C. africana* Boidin, corticioid basidioma, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Floudas and Hibbett 2015 (phylogeny), Justo et al. 2017 (phylogeny, Polyporales), new spp. see Duhem and Buyck 2011a (morphology, New Caledonia).

Cantharellopsis Kuyper 1986, *incertae sedis*, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *C. prescotii* (Weinm.) Kuyper, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Larsson et al. 2006 (phylogeny, Hymenochaetales).

Cantharellula Singer 1936, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *C. umbonata* (J.F. Gmel.) Singer, worldwide (temperate), see Kirk et al. 2013 (genus accepted), sequence data available, see Osmundson et al. 2013 (DNA barcode), Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae).

Cantharellus Adans.ex Fr. 1821, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph unknown, c. 300 species estimated, see Buyck et al. 2014, Buyck 2016, type species *C. cibarius* Fr., six subgenera: *Afrocantharellus* Eyssart. & Buyck, *Cantharellus* Adans. ex Fr., *Cinnabarinus* Buyck & V. Hofst., *Parvocantharellus* Eyssart. & Buyck, *Pseudocantharellus* Eyssart. & Buyck, *Rubrinus* Eyssart. & Buyck, (the 7th subgenus has been suggested for neotropical species, i.e. *C. guyanensis* Mont. (see Buyck et al. 2016a), c. 15 sections, ectomycorrhizal, terrestrial, worldwide, see Kirk et al. 2013 (genus accepted), multiple

commercially important edible species, see Buyck 1994 (Africa), Pilz et al. 2003, Buyck 2008 (Madagascar), Arora and Dunham 2008 (North America), Shao et al. 2011, sequence data available, see Moncalvo et al. 2006 (cantharelloid clade), Buyck et al. 2013 (phylogeny, Africa), Buyck et al. 2014 (world multigene phylogeny), Buyck et al. 2015 (phylogeny, Madagascar), De Kesel et al. 2016 (multigene phylogeny, new section, Africa); Olariaga et al. 2015c (phylogeny, Europe), Buyck et al. 2016c (phylogeny, America), epitypifications and new species, for Asia, see Eyssartier et al. 2009, Kumari et al. 2011, 2013c, Tian et al. 2012, Das et al. 2015c, Suhara and Kurogi 2015, Shao et al. 2014, 2016a, b, Antonín et al. 2017a; for Africa, see Tibuhwa et al. 2008, De Kesel and Buyck 2011, Buyck 2012, 2014, Buyck et al. 2016a, b, c, d, e, f, g, 2017, 2018, 2019; for Madagascar, see Ariyawansa et al. 2015, Buyck et al. 2015, for Europe, see Olariaga et al. 2015c; for North America, see Buyck and Hofstetter 2011, Buyck et al. 2010b, 2011, 2016d, e, Thorn et al. 2017; for South America, see Wartchow et al. 2012a, b, Pinheiro and Warchow 2013, Henkel et al. 2014b, Nascimento et al. 2014; for New Caledonia, see Buyck 2014, Buyck et al. 2016d.

Cantharocybe H.E. Bigelow & A.H. Sm. 1973, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *C. gruberi* (A.H. Sm.) H.E. Bigelow & A.H. Sm., on soil, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Ovrebo et al. 2011 (phylogeny, morphology, Belize), Kumar and Manimohan 2013 (new combination, phylogeny), Hosen et al. 2016b (phylogeny, Bangladesh), new combination see Kumar and Manimohan 2013 (India).

Capillosclerotium Prameela & Deeba 2013, Corticiaceae, Corticiales, Agaricomycetes, sexual morph unknown, one species, type species *C. indicum* Prameela & Deeba, causing the stem rot of cluster bean, India, sequence data available, see Devi et al. 2013 (phylogeny).

Capitulocladosporium L.Y. Sun, X. Sun & L.D. Guo 2017, *incertae sedis*, *incertae sedis*, Ustilaginomycetes, one species, type species *C. clinodiplosidis* L.Y. Sun, X. Sun & L.D. Guo, China, host midge (genus *Clinodiplosis*), cultures available, sequence data available, see Sun et al. 2018 (taxonomy).

Carcinomyces Oberw. & Bandoni 1982, Carcinomycetaceae, Tremellales, Tremellomycetes, sexual and asexual morphs known, three species, type species *C. effibulatus* (Ginns & Sunhede) Oberw. & Bandoni, yeast, mycoparasite, worldwide, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Caripia Kuntze 1898, Omphalotaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. montagnei* (Berk.) Kuntze, America, see Ginns 2011a (USA, morphology), Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Mata et al. 2006 (phylogeny).

Carlosrosaea A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Trimorphomycetaceae, Tremellales, Tremellomycetes, sexual morph unknown, three species, type species *C. vrieseae* (M.F. Landell, L.R. Brandão, S.V. Safar, F.C. Gomes, C.R. Félix, A.R. Santos, D.M. Pagani, J.P. Ramos, L. Broetto, T. Mott, M.H. Vainstein, P. Valente & C.A. Rosa) A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, Europe, Brazil, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny), new spp. see Felix et al. 2017 (Brazil).

Carolinigaster M.E. Sm. & S. Cruz 2018, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *C. bonitoi* M.E. Sm. & S. Cruz, basidioma hypogeous, ectomycorrhizal, USA, sequence data available, see Crous et al. 2018a (taxonomy).

Castellanea T.W. Henkel & M.E. Sm. 2015, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *C. pakaraimophila* T.W. Henkel & M.E. Sm., sequestrate, ectomycorrhizal, South America, sequence data available, see Smith et al. 2015 (phylogeny, taxonomy).

Castoreum Cooke & Massee 1887, Mesophelliaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, three species, type species *C. radicatum* Cooke & Massee, Australia, see Kirk et al. 2013 (genus accepted), sequence data available, see Truong et al. 2017b (DNA-barcoding).

Catathelasma Lovejoy 1910, Biannulariaceae, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *C. evanescens* Lovejoy, North temperate, see Zhang et al. 2009 (biochemical analysis), Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Dentinger et al. 2011 (DNA barcode), Sánchez-García et al. 2017 (phylogeny, new family).

Catatrama Franco-Mol. 1991, Amanitaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *C. costaricensis* Franco-Mol., India, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Yang et al. 2018b (phylogeny).

Catilla Pat. 1915, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. pandani* (Pat.) Pat., Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Caudicicola Miettinen, M. Kulju & Kotir. 2017, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *C. gracilis* Miettinen, M. Kulju & Kotir., resupinate basidioma, poroid hymenophore, wood-rotting, Finland, on stumps and roots of *Picea*

abies and *Pinus sylvestris*, sequence data available, see Justo et al. 2017 (phylogeny, Polyporales), Kotiranta et al. 2017 (new genus, new sp., morphology).

Caulorhiza Lennox 1979, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *C. umbonata* (Peck) Lennox, USA, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny).

Celatogloea P. Roberts 2005, *incertae sedis*, *incertae sedis*, Basidiomycota, asexual morph unknown, one species, type species *C. simplicibasidium* (Lindsey & Gilb.) P. Roberts, USA, sequence data unavailable, see Kirk et al. 2008.

Cellypha Donk 1959, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, ten species, type species *C. goldbachii* (Weinm.) Donk, worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cenangiomyces Dyko & B. Sutton 1979, *incertae sedis*, *incertae sedis*, Agaricomycetes, one species, type species *C. luteus* Dyko & B. Sutton, British Isles, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Centrolepidosporium R.G. Shivas & Vánky 2007, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, one species, type species *C. sclerodermum* R.G. Shivas & Vánky, plant parasite on *Centrolepis exserta* (Centrolepidaceae), Australia, cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Cephaloscypha Agerer 1975, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. mairei* (Pilát) Agerer, saprophytic, worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Ceraceomyces Jülich 1972, Amylocorticiaceae, Amylocorticiales, Agaricomycetes, asexual morph unknown, 16 species, type species *C. tessulatus* (Cooke) Jülich, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Dhingra and Singh 2008b (India), Zmitrovich 2008 (species manual), Chikowski et al. 2017 (Atlantic Rain Forest, Brazil).

Ceraceopsis Hjortstam & Ryvarden 2007, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, one species, type species *C. verruculosa* Hjortstam & Ryvarden, Venezuela, sequence data unavailable, see Hjortstam et al. 2007 (taxonomy).

Ceraceopsora Kakish., T. Sato & S. Sato 1984, Chaconiaceae, Pucciniales, Pucciniomycetes, one species, type species *C. elaeagni* Kakish., T. Sato & S. Sato, biotrophic on Elaeagnaceae, (Ranunculaceae alternate host), terrestrial, Japan, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Ceraceosorus B.K. Bakshi 1976, Ceraceosoraceae, Ceraceosorales, Exobasidiomycetes, three species, type species *C. bombacis* (B.K. Bakshi) B.K. Bakshi, plant parasites (leaves) on *Bombax* spp. (Malvaceae), India, West Africa, Guam, saprobic yeast states on plants, cultures available, see Kirk et al. 2013 (genus accepted), sequence data available, see Wang et al. 2015c, Kijpornyongpan and Aime 2016, Piatek et al. 2016, Kijpornyongpan et al. 2018 (smut pathogenic ancestry of the fungal clade Ustilaginomycotina, genome).

Cerarioporia F. Wu, L.W. Zhou & Jing Si 2016, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *C. cystidiata* F. Wu, L.W. Zhou & J. Si, wood-rotting, China, sequence data available, see Wu et al. 2016c (taxonomy, China).

Ceratellopsis Konrad & Maubl. 1937, Gomphaceae, Gomphales, Agaricomycetes, asexual morph unknown, nine species, type species *C. queletii* (Pat.) Konrad & Maubl., wood-decaying, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Ceratobasidium D.P. Rogers 1935, Ceratobasidiaceae, Cantharellales, Agaricomycetes, asexual morph *Ceratorhiza*, c. 19 species, type species *C. calosporum* D.P. Rogers, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Samuels et al. 2012 (Southeast Asia, Melanesia, taxonomy), Oberwinkler et al. 2013a (only recognized one species in the genus, transferring the others to *Rhizoctonia*), Zhou et al. 2017 (China, pathogenic), new spp. see Diederich et al. 2014 (Europe).

Ceratocoma Buriticá & J.F. Hennen 1991, Pucciniosiraceae, Pucciniales, Pucciniomycetes, one species, type species *C. jacksoniae* (Henn. ex McAlpine) Buriticá & J.F. Hennen, biotrophic on Fabaceae, terrestrial, Australia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Ceratoporia Ryvarden & de Meijer 2002, Ceratobasidiaceae, Cantharellales, Agaricomycetes, asexual morph unknown, one species, type species *C. perplexa* Ryvarden & de Meijer, saprobic, Brazil, sequence data unavailable, see Kirk et al. 2008.

Ceratorhiza R.T. Moore 1987, Ceratobasidiaceae, Cantharellales, Agaricomycetes, asexual *Ceratobasidium/Rhizoctonia*, seven species, type species *C. goodyerae-repentis* (Costantin & L.M. Dufour) R.T. Moore, pathogenetic, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Hu et al. 2010 (pathogenicity), Amirmijani et al. 2012 (Iran), Oberwinkler et al. 2013a (considered as a synonym of *Rhizoctonia*).

Ceratosebacina P. Roberts 1993, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, three species, type species *C. longispora* (Hauerslev) P. Roberts, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Weiß and Oberwinkler 2001 (phylogeny).

Cercopemyces T.J. Baroni, Kropp & V.S. Evenson 2014, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph

unknown, three species, type species *C. crocodilinus* T.J. Baroni, Kropp & V.S. Evenson, USA, sequence data available, see Baroni et al. 2014 (phylogeny, taxonomy).

Cericium Hjortstam 1995, Cystostereaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. luteoincrustatum* (Hjortstam & Ryvarden) Hjortstam, south America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cerinomyces G.W. Martin 1949, Cerinomycetaceae, Dacrymycetales, Dacrymycetes, asexual morph unknown, 13 species, type species *C. pallidus* G.W. Martin, wood-decaying, widespread (temperate), see Kirk et al. 2013 (genus accepted), sequence data available, see Shirouzu et al. 2013b (phylogeny, several species with clamp connections and mainly 0–1-septate basidiospores are in Cerinomycetaceae clade), new combination see Malysheva 2009.

Cerinosterus R.T. Moore 1987, Dacrymycetaceae, Dacrymycetales, Dacrymycetes, sexual morph *Femsjonia* Fr., one species, type species *C. luteoalbus* (de Hoog) R.T. Moore, wood-decaying, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Lim et al. 2005 (fungal diversity).

Cerioporus Quél. 1886, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 15 species, type species *C. squamosus* (Huds.) Quél., polyporoid basidiomas, wood-rotting, white rot, cosmopolitan, see Zmitrovich and Kovalenko 2016 (genus re-establishing, phylogeny), Zmitrovich et al. 2017 [*C. rangiferinus* (Bolton) Zmitr. et al. re-habilitation, phylogeny].

Ceriporia Donk 1933, Irpicaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 50 species, type species *C. viridans* (Berk. & Broome) Donk, basidioma resupinate, hymenophore poroid, wood-rotting, white rot, cosmopolitan, see Kirk et al. 2013 (genus accepted), sequence data available, see Miettinen et al. 2012 (phylogeny), new spp. see Læssøe and Ryvarden 2010a (morphology, Ecuador), Mata and Ryvarden 2010 (morphology, Costa Rica), Jia and Cui 2011 (morphology, China), Gomes-Silva et al. 2012b (morphology, Brazil), Jia et al. 2014 (phylogeny, China), Ryvarden 2014 (morphology, tropical America), Soares et al. 2015 (morphology, Brazil, Neotropics), Miettinen et al. 2016a (phylogeny, France, Indonesia, Russia, USA), Spirin et al. 2016b (phylogeny, *C. purpura* group, Europe, North America), Yuan et al. 2017c (phylogeny, tropical China), Ryvarden 2018a (morphology, Seychelles), new combinations see Ryvarden 2015c (morphology), Ryvarden et al. 2017 (morphology), needs revision since genus shown to be polyphyletic, see Jia et al. 2014, Miettinen et al. 2016a.

Ceriporiopsis Domański 1963, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 40 species (needs revision since genus shown to be polyphyletic, see Zhao and Cui 2014, Justo et al. 2017), type species *C. gilvescens* (Bres.) Domański, resupinate basidioma, poroid hymenophore, wood-rotting, white rot, cosmopolitan, see Kirk et al. 2013 (genus accepted), sequence data available, see Miettinen and Rajchenberg 2012 (phylogeny), new spp. see Læssøe and Ryvarden 2010b (morphology, Ecuador), Mata and Ryvarden 2010 (morphology, Costa Rica), Vlasák et al. 2012 (phylogeny, USA), Cui 2013b (morphology, China), Zhao and Cui 2014 (phylogeny, China), Zhao et al. 2015c (phylogeny, China), Gomes-Silva et al. 2016 (morphology, Brazil), Ryvarden 2016b (morphology, tropical America), Spirin and Ryvarden 2016 (morphology, Mexico), Ryvarden 2016b, 2018 (morphology, Namibia, Burundi, Ethiopia, Mozambique), Zhao and Wu 2017 (phylogeny, China), new combination see Ryvarden 2015c (morphology, type study, India).

Ceropsora B.K. Bakshi & Suj. Singh 1960, Coleosporiaceae, Pucciniales, Pucciniomycetes, one species, type species *C. piceae* (Barclay) B.K. Bakshi & Suj. Singh, biotrophic on Pinaceae, terrestrial, India, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cerotelium Arthur 1906 (= *Catenulopsora* Mundk. 1943), Phakopsoraceae, Pucciniales, Pucciniomycetes, 27 species, type species *C. canavaliae* Arthur, biotrophic on Aristolochiaceae, Fabaceae, Moraceae, Papaveraceae, Urticaceae, terrestrial, circumglobal in tropics and subtropics, fig rust (*C. fici* (Castagne) Arthur), cotton rust (*C. desmium* (Berk. & Broome) Arthur), see Kirk et al. 2013 (genus accepted), Latinovic et al. 2015 (pathogen, Montenegro), sequence data available, new spp. see Yepes and de Carvalho 2009, Mohanan 2010.

Cerradoa J.F. Hennen & Y. Ono 1978, *incertae sedis*, Pucciniales, Pucciniomycetes, one species, type species *C. palmaea* J.F. Hennen & Y. Ono (current name: *Edythea palmaea* (J.F. Hennen & Y. Ono) Cummins & Y. Hirats.), sequence data unavailable.

Cerrena Gray 1821, Cerrenaceae, Polyporales, Agaricomycetes, asexual morph unknown, seven species, type species *C. cinerea* (Pers.) Gray (current name: *C. unicolor* (Bull.) Murrill), hymenophore poroid to daedaloid or irpicoid, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Zmitrovich and Malysheva 2013 (phylogeny), Justo et al. 2017 (phylogeny, Polyporales), new sp. see Lee and Lim 2010 (phylogeny, South Korea), new combinations see Yuan 2014 (phylogeny).

Chaconia Juel 1897, Chaconiaceae, Pucciniales (= *Bitzea* Mains 1939, = *Desmotelium* Syd. 1937), Pucciniomycetes, twelve species, type species *C. alutacea* Juel, biotrophic on Bignoniaceae, Clusiaceae, Euphorbiaceae, Fabaceae, Heliconiaceae, Mimosaceae, Moraceae, Oleaceae, terrestrial, India, South America (Brazil, French Guiana, Paraguay, Venezuela), Thailand, West Africa, sequence data

unavailable, see Berndt 2008b (*C. hennenii* Berndt, holomorph species for *Uredo maclurae* and *Uredo celtidis*), Kirk et al. 2013 (genus accepted), new spp. see Berndt and Beenken 2013 (notes, key).

Chaetocalathus Singer 1943, Marasmiaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 20 species, type species *C. craterellus* (Durieu & Lév.) Singer, saprophytic, worldwide, see Takahashi and Degawa 2011 (Japan), Antonín and Noordeloos 2010 (Europe), Antonín 2012 (morphology, tropical Africa), Kirk et al. 2013 (genus accepted), sequence data available, see Bodensteiner et al. 2004 (phylogeny, cyphelloid homobasidiomycetes), Kerekes and Desjardin 2009 (monograph, *Crinipellis*, *Moniliophthora,* Southeast Asia).

Chaetodermella Rauschert 1988, Gloeophyllaceae, Gloeophyllales, Agaricomycetes, asexual morph unknown, one species, type species *C. luna* (Romell ex D.P. Rogers & H.S. Jacks.) Rauschert, Europe, see Kirk et al. 2013 (genus accepted), sequence data available see Sjökvist et al. 2012 (phylogeny).

Chaetospermum Sacc. 1892, Sebacinaceae, Sebacinales, Agaricomycetes, asexual known, four species, type species *C. tubercularioides* Sacc., worldwide, see Roberts 2011 ('*E. rolleyi*', morphology), Kirk et al. 2013 (genus accepted), sequence data available, see Riess et al. 2014 (phylogeny), Oberwinkler et al. 2014 (taxonomy, phylogeny, Sebacinales).

Chaetotyphula Corner 1950, Pterulaceae, Agaricales, Agaricomycetes, asexual morph unknown, seven species, type species *C. hyalina* (Jungh.) Corner, tropical, see Kirk et al. 2013 (genus accepted), sequence data available, see Dentinger and McLaughlin 2006 (phylogeny).

Chalciporus Bataille 1908 (= *Rubinoboletus* Pilát & Dermek 1969), Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 30 species, type species *C. piperatus* (Bull.) Bataille, stipitate-pileate, parasitic? (at least the type species is mycoparasitic see Nuhn et al. 2013), worldwide, some species edible (*C. rubritubifer* (Kauffman) Singer) see Bessette et al. 2017 (Eastern North America), see Kirk et al. 2013 (genus accepted), sequence data available, new species see Degreef and De Kesel 2008 (Cameroon), Wu et al. 2016f (China), Zhang et al. 2017c (China).

Chamaemyces Battarra ex Earle 1909, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *C. alphitophyllus* (Berk. & M.A. Curtis) Earle, agaricoid, saprotrophic, North temperate, see Kirk et al. 2013 (genus accepted), sequence data available, see Vellinga 2004 (phylogeny), Walther et al. 2005 (phylogeny), Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Saar et al. 2009 (phylogeny).

Chamonixia Rolland 1899, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, eight species, type species *C. caespitosa* Rolland, sequestrate, worldwide, see Mleczko et al. 2009 (new record, central Europe), Kirk et al. 2013 (genus accepted), sequence data available, see Binder and Hibbett 2006 (phylogeny, Boletales), Orihara et al. 2016a (new record, Japan).

Chardoniella F. Kern 1939, Pucciniosiraceae, Pucciniales, Pucciniomycetes, four species, type species *C. gynoxidis* F. Kern, biotrophic on Asteraceae, terrestrial, South America (Bolivia, Colombia, Ecuador, Peru), see Kirk et al. 2013 (genus accepted), sequence data available, see Zuluaga et al. 2011 (Colombian Andean region, Uredinales).

Cheimonophyllum Singer 1955, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *C. candidissimum* (Berk. & M.A. Curtis) Singer, worldwide, see Blanco-Dios 2014b (morphology, keys), Kirk et al. 2013 (genus accepted), sequence data available, see Matheny et al. 2006 (phylogeny).

Chernovia A.M. Yurkov & Begerow 2016, *incertae sedis*, *incertae sedis*, Wallemiomycetes, sexual morph unknown, one species, type species *C. houtui* J. Federici, A.M. Yurkov & D. Begerow, yeast, soil, Germany, sequence and cultures available, see Yurkov et al. 2016 (new spp., Germany).

Chionosphaera D.E. Cox 1976 (= *Fibulostilbum* Seifert & Oberw. 1992), Chionosphaeraceae, Agaricostilbales, Agaricostilbomycetes, yeast stage known for *C. apobasidialis* and *C. cuniculicola*, six species, type species *C. apobasidialis* D.E. Cox, presumably mycophilic on ascomycetes but nature of the association is unclear, on bark of deciduous wood, in beetle galleries in dead wood, on lichens, on ascocarps of *Phylacia poculiformis*, Europe and North America, cultures and sequence data available, see Kurtzman et al. 2011 (taxonomy), Wang et al. 2015e(phylogeny).

Chiua Y.C. Li & Zhu L. Yang 2016, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, four species, type species *C. virens* (W.F. Chiu) Yan C. Li & Zhu L. Yang, stipitate-pileate, China, sequence data available, see Wu et al. 2016f (taxonomy, China).

Chlamydopus Speg. 1898, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. clavatus* Speg. (current name: *C. meyenianus* (Klotzsch) Lloyd), desert areas, see Kirk et al. 2013 (genus accepted), sequence data available, see Martín et al. 2000 (phylogeny).

Chlorogaster Læssøe & Jalink 2004, Sclerodermataceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *C. dipterocarpi* Læssøe & Jalink, Sabah, sequence data unavailable, see Kirk et al. 2008.

Chlorolepiota Sathe & S.D. Deshp. 1979, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *C. mahabaleshwarensis* Sathe & S.D. Deshp., India, see Kirk et al. 2013 (genus accepted),

Kumari et al. 2013c (morphology, India), sequence data available, see Atri et al. 2014 (new spp., India).

Chlorophyllum Massee 1898, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, 19 species, type species *C. esculentum* Massee, agaricoid, sequestrate, worldwide, see Ge and Yang 2006 (China, key), Kirk et al. 2013 (genus accepted), sequence data available, see Vellinga 2006 (United Kingdom, key), Crous et al. 2015a, b (morphology, phylogeny), Ge et al. 2018 (phylogeny, new spp., key).

Chondrogaster Maire 1926, Mesophelliaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, two species, type species *C. pachysporus* Maire, Mauritania Brazil, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Lupatini et al. 2008 (mycorrhizal morphotyping and molecular characterization), Hosaka et al. 2008 (phylogeography).

Chondrostereum Pouzar 1959, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *C. purpureum* (Pers.) Pouzar, worldwide, wood decaying (*C. purpureum* (Pers.) Pouzar), see Lygis et al. 2004 (pathogen), Vartiamäki 2009 (silvicide use), Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2004 (phylogeny, corticioid homobasidiomycetes).

Chromocyphella De Toni & Levi 1888, Chromocyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *C. crouanii* Pat. & Doass., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Petersen et al. 2010 (phylogeny, Crepidotaceae), Moreno et al. 2017b (new spp., phylogeny).

Chromosera Redhead, Ammirati & Norvell 1995, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *C. cyanophylla* (Fr.) Redhead, Ammirati & Norvell, three subgenera: *Chromosera* Redhead, Ammirati & Norvell 1995, *Oreocybe (Boertm.)* Vizzini, Lodge & Padamsee 2013, *Subomphalia* Vizzini, Lodge & Padamsee 2013, worldwide, see Kirk et al. 2013 (genus accepted), Holec et al. 2015 (Europe), sequence data available, see Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae).

Chroogomphus (Singer) O.K. Mill. 1964, Gomphidiaceae, Boletales, Agaricomycetes, asexual morph unknown, 23 species, type species *C. rutilus* (Schaeff.) O.K. Mill., ectomycorrhizal, widespread (north temperate), some species edible (*C. confusus* Yan C. Li et Zhu L. Yang), see Dai et al. 2010b (edible mushrooms, China), some medicinal use (*C. rutilus* (Schaeff.: Fr.) O.K. Miller), see Dai and Yang 2008 (medicinal mushrooms, China), Kirk et al. 2013 (genus accepted), Feng et al. 2014 (compounds), sequence data available, see Li et al. 2009b (phylogeny, new spp.), Martín et al. 2016 (phylogeny), Scambler et al. 2018 (monograph, new sp., typification, Europe).

Chrysella Syd. 1926, Pucciniaceae, Pucciniales, Pucciniomycetes, one species, type species *C. mikaniae* Syd., biotrophic on Asteraceae, terrestrial, Central America (Costa Rica), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Chrysocelis Lagerh. & Dietel, in Mayor 1914, (= *Stomatisora* J.M. Yen 1971), Mikronegeriaceae, Pucciniales, Pucciniomycetes, five species, type species *C. lupini* Lagerh. & Dietel, biotrophic on Acanthaceae, Cucurbitaceae, Fabaceae, Polygonaceae, Zingiberaceae, terrestrial, Central America (Costa Rica), South America (Colombia, Ecuador), India, Japan, Philippines, see Kirk et al. 2013 (genus accepted), sequence data available, see Zuluaga et al. 2011 (Colombian Andean region, Uredinales).

Chrysoconia McCabe & G.A. Escobar 1979, Coniophoraceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *C. orthospora* McCabe & G.A. Escobar, Réunion, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Chrysocyclus Syd. 1925 (= *Holwayella* H.S. Jacks. 1926), Pucciniaceae, Pucciniales, Pucciniomycetes, three species, type species *C. cestri* (Dietel & Henn.) Syd., biotrophic on Asteraceae, Solanaceae, terrestrial, Central and South America, see Kirk et al. 2013 (genus accepted), sequence data available, see Zuluaga et al. 2011 (Colombian Andean region, Uredinales).

Chrysomphalina Clémençon 1982, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *C. chrysophylla* (Fr.) Clémençon, saprotrophic, white rot, see Kirk et al. 2013 (genus accepted), Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae), sequence data available, see Matheny and Bougher 2006 (phylogeny), Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae).

Chrysomyxa Unger 1840 (= *Barclayella* Dietel 1890, = *Coleosporium* subgen. *Melampsoropsis* J. Schröt., in Cohn 1879, = *Melampsoropsis* (J. Schröt.) Sacc. 1888, = *Melampsoropsis* (J. Schröt.) Arthur 1906, = *Stilbechrysomyxa* M.M. Chen 1984, ? = *Hiratsukaia* Hara 1948), Coleosporiaceae, Pucciniales, Pucciniomycetes, 38 species, type species *C. abietis* (Wallr.) Unger, biotrophic on Aquifoliaceae, Ericaceae, Pinaceae (alternate host), terrestrial, worldwide, cause witches' brooms and needle and cone diseases mainly on *Picea*, see Kirk et al. 2013 (genus accepted), sequence data available, see Kaitera et al. 2010 (phylogeny, Finland), Feau et al. 2011 (phylogeny, DNA barcoding), new spp. see Cao et al. 2016 (China).

Chrysopsora Lagerh. 1891 [1892], Pucciniaceae, Pucciniales, Pucciniomycetes, one species, type species *C. gynoxidis* Lagerh. 1891 [1892] (current name: *Psora*

testacea Hoffm.), biotrophic on Asteraceae (*Gynoxys*), terrestrial, Ecuador, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Chrysozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, Chrysozymaceae, *incertae sedis*, Microbotryomycetes, sexual morph unknown, two species, type species *C. griseoflava* (Nakase & M. Suzuki) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, on plant, Asia (China, Japan), sequence data available, see Wang et al. 2015e (taxonomy).

Cibaomyces Zhu L. Yang, Y.J. Hao & J. Qin 2014, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. glutinis* Zhu L. Yang, Y.J. Hao & J. Qin, East Asia, Europe, sequence data available, see Hao et al. 2014 (monograph), Moreau et al. 2015b (Europe).

Cilicia Fr. 1825, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, two species, type species *C. aeruginosa* Fr., Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cinereomyces Jülich 1982, Gelatoporiaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *C. lindbladii* (Berk.) Jülich, basidiomas resupinate, hymenophore poroid, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Miettinen and Rajchenberg 2012 (phylogeny), Miettinen 2012 (new combination, morphology), Justo et al. 2017 (phylogeny, Polyporales).

Cinereomycetella Zmitr. 2018, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, monotypic, one species, type species *C. overholtsii* (Pilát) Zmitr., resupinate basidioma, poroid hymenophore, wood-rotting, white rot, see Zmitrovich 2018a (taxonomy).

Cintractia Cornu 1883, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, 13 species, type species *C. axicola* (Berk.) Cornu, plant parasites (floral axis, ovaries) on Cyperaceae (not *Carex* spp.), widespread in tropics and subtropics, cultures available, see Kirk et al. 2013 (genus accepted), sequence data available, see Piepenbring et al. 1999, Begerow et al. 2014, Wang et al. 2015c (phylogeny).

Cintractiella Boedijn 1937, Cintractiellaceae, Ustilaginales, Ustilaginomycetes, two species, type species *C. lamii* Boedijn, plant parasites (galls, witches' brooms) on Cyperaceae (genera *Hypolytrum*, *Diplasia*), South America, Indonesia, cultures unavailable, sequence data unavailable, see Kirk et al. 2013 (genus accepted), Begerow et al. 2014 (taxonomy).

Cionothrix Arthur 1907, Pucciniosiraceae, Pucciniales, Pucciniomycetes, five species, type species *C. praelonga* (G. Winter) Arthur, biotrophic on Asteraceae, terrestrial, tropical Central and South America, Cuba, see Kirk et al. 2013 (genus accepted), sequence data unavailable, see Berndt 2017 (new spp., morphology, emendation).

Circulocolumella S. Ito & S. Imai 1957, Hysterangiaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, one species, type species *C. hahashimensis* (S. Ito & S. Imai) S. Ito & S. Imai, Bonin island, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Citripora Miettinen 2016, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *C. bannaensis* Miettinen, basidioma resupinate to piletate, hymenophore poroid, wood-rotting, white rot, widespread (Uganda, China), sequence data unavailable, see Miettinen and Ryvarden 2016 (taxonomy, China), Justo et al. 2017 (taxonomy, Polyporales), Zmitrovich 2018a (taxonomy).

Clarkeinda Kuntze 1891, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *C. pedilia* (Berk. & Broome) Kuntze, South Asia, see Kirk et al. 2013 (genus accepted), sequence data available, see Vellinga et al. 2011 (phylogeny), Li et al. 2016b (morphology, phylogeny).

Classicula R. Bauer, Begerow, Oberw. & Marvanová 2003, Classiculaceae, Classiculales, Classiculomycetes, recommended for protection over *Naiadella* Marvanová & Bandoni 1987 see Aime et al. 2018a, asexual morph described as *Naiadella fluitans*, two species, type species *C. fluitans* R. Bauer, Begerow, Oberw. & Marvanová, (self)mycoparasitic, in aquatic habitats associated with leaf litter, submerged plants, worldwide, see Aime et al. 2018b (nomenclature), cultues and sequence data available, see Aime et al. 2006 (phylogeny), Bauer et al. 2006 (phylogeny), Aime et al. 2014 (phylogeny), new spp. see Qiao et al. 2018 (China).

Clathrogaster Petri 1900, Hysterangiaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, two species, type species *C. vulvarius* Petri, Borneo, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Clathrus P. Micheli ex L. 1753, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, c. 20 species, type species *C. ruber* P. Micheli ex Pers., terrestrial, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Giachini et al. 2010 (phylogeny), Trierveiler-Pereira et al. 2014a (phylogeny), new spp. see Fazolino et al. 2010 (Brazil), Lécuru et al. 2013 (Caribbean), Pietras et al. 2016 (Poland).

Claustula K.M. Curtis 1926, Claustulaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *C. fischeri* K.M. Curtis, terrestrial, New Zealand, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006 (phylogeny).

Clavaria Vaill. ex L. 1753, Clavariaceae, Agaricales, Agaricomycetes, asexual morph unknown, 32 species, type species *C. fragilis* Holmsk., worldwide, saprobic, mycorrhizal, some species edible (*C. vermicularis* Sw.), see Dai et al. 2010b (edible mushrooms, China), Kirk et al. 2013

(genus accepted), sequence data available, see Kautmanová et al. 2012b (Europe, phylogeny), Birkebak et al. 2013, 2016 (Clavariaceae, phylogeny, new genus), Olariaga et al. 2015b (phylogeny), new spp., see Furtado et al. 2016 (Brazil, new records).

Clavariachaete Corner 1950, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, two species, type species *C. rubiginosa* (Berk. & M.A. Curtis ex Cooke) Corner, South America (tropical, Brazil and Venezuela), basidioma coralloid (like-*Ramaria*), sequence data unavailable, see Parmasto et al. 2010 (morphology), Kirk et al. 2013 (genus accepted).

Clavariadelphus Donk 1933, Clavariadelphaceae, Gomphales, Agaricomycetes, asexual morph unknown, 20 species, type species *C. pistillaris* (L.) Donk, widespread (temperate), see Kirk et al. 2013 (genus accepted), sequence data available, see Durall et al. 2006, new spp. see Hanif et al. 2014 (Himalaya, Pakistan).

Clavicorona Doty 1947, Clavariaceae, Agaricales, Agaricomycetes, asexual morph unknown, ten species, type species *C. taxophila* (Thom) Doty, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Birkebak et al. 2013 (phylogeny).

Clavogaster Henn. 1896, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *C. novozelandicus* Henn., New Zealand, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Clavomphalia E. Horak 1987, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. yunnanensis* E. Horak, China, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Clavulicium Boidin 1957, *incertae sedis*, Cantharelllales, Agaricomycetes, asexual morph unknown, three species, type species *C. macounii* (Burd.) Parmasto (= *C. pilatii* (Boidin) Boidin, see Martelli 2016), widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Sjökvist et al. 2014 (phylogenetic affinities), erroneously attributed spp. see Singh et al. 2012 (India).

Clavulina J. Schröt. 1888, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph unknown, c. 75 species, type species *C. cristata* (Holmsk.) J. Schröt., some species edible (*C. cinerea* (Bull.) J. Schröt.), see Dai et al. 2010b (edible mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Smith et al. 2011 (ectomycorrhizal fungal diversity), new spp. see Henkel et al. 2011 (Guiana Shield), Uehling et al. 2012a, b (Guiana Shield), Felipe 2012 (Brazil), He et al. 2016 (southwestern China), Tibpromma et al. 2017 (notes).

Clavulinopsis Overeem 1923, Clavariaceae, Agaricales, Agaricomycetes, asexual morph unknown, 34 species, type species *C. sulcata* Overeem, worldwide, terrestrial, see Kirk et al. 2013 (genus accepted), Olariaga and Salcedo 2013 (new combination), sequence data available, see Birkebak et al. 2013, 2016 (Clavariaceae, phylogeny, new genus), new spp. see Hyde et al. 2016 (Brazil).

Cleistocybe Ammirati, A.D. Parker & Matheny 2007, Pseudoclitocybaceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *C. vernalis* Ammirati, A.D. Parker & Matheny, basidioma clitocyboid, western North America, sequence data available, see Ammirati et al. 2007 (monograph), new spp. see Wu et al. 2018b (China).

Cleptomyces Arthur 1918, Pucciniaceae, Pucciniales, Pucciniomycetes, one species, type species *C. lagerheimianus* (Dietel) Arthur 1918, biotrophic on Verbenaceae, terrestrial, South America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Climacocystis Kotl. & Pouzar 1958, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *C. borealis* (Fr.) Kotl. & Pouzar, basidioma pileate, hymenophore poroid, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Song et al. 2014a (new sp., phylogeny, China), Justo et al. 2017 (phylogeny, Polyporales), Zmitrovich 2018a (taxonomy).

Climacodon P. Karst. 1881, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, seven species, type species *C. septentrionalis* (Fr.) P. Karst., basidioma pileate, hymenophore hydnoid, wood-rotting, white rot, some species tree pathogen, see Koski-Kotiranta and Niemelä 1987 (distribution, North Europe, *C. septentrionalis*), widespread, some species edible, see Dai et al. 2010a, b (edible mushrooms, China, *C. septentrionalis*), Kirk et al. 2013 (genus accepted), Jia et al. 2015 (*C. septentrionalis*, antioxidant activity, compounds), sequence data available, see Yuan and Cao 2016 (hydnaceous fungi, China), Moreno et al. 2017b (phylogeny, type study), Justo et al. 2017 (phylogeny, Polyporales).

Clinoconidium Pat. 1898, Cryptobasidiaceae, Exobasidiales, Exobasidiomycetes, six species, type species *C. farinosum* Pat. ex Sacc., plant parasites (leaves, fruits) on Lauraceae, Central and South America, East Asia, Canary Islands, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2002, 2014 (taxonomy), Wang et al. 2015c (taxonomy, phylogeny), Jiang and Kirschner 2016 (taxonomy, phylogeny), Kakishima et al. 2017b, c (morphology, new name).

Clintamra Cordas & Durán 1977, Clintamraceae, Ustilaginales, Ustilaginomycetes, one species, type species *C. nolinae* (G.P. Clinton) Cordas & Durán, plant parasite (leaves, flowers) on *Nolina microcarpa* (Asparagaceae), Mexico, USA, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Clitocella Kluting, T.J. Baroni & Bergemann 2014, Entolomataceae, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *C. popinalis* (Fr.) Kluting, T.J. Baroni & Bergemann, on soil or rotten wood, worldwide, sequence data available, see Kluting 2013 (taxonomy), Vizzini et al. 2016d (new combination, phylogeny), dos Santos Silva-Filho et al. 2018 (new sp., new combination, Brazil).

Clitocybe (Fr.) Staude 1857, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. 300 species, type species *C. nebularis* (Batsch) P. Kumm., worldwide, some species edible (*C. robusta* Peck), see Hall et al. 2003 (edible mushrooms), Dai et al. 2010b (edible mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Walther et al. 2005 (conidiogenesis study), Osmundson et al. 2013 (DNA barcode), Alvarado et al. 2015 (phylogeny), new spp. see Seok et al. 2009 (Korea, doubtful generic assignment), Cooper 2014b (New Zealand), Musumeci and Contu 2014a (France), Specht 2014 (Germany), Specht et al. 2014 (Germany), Musumeci and Contu 2015 (France), Lüderitz et al. 2016 (Germany).

Clitocybula (Singer) Singer ex Métrod 1952, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, 25 species, type species *C. lacerata* (Scop.) Métrod, worldwide, lignicolous, wood-rotting, see Barrasa et al. 2006 (brown-rot, Spain), see Kirk et al. 2013 (genus accepted), sequence data available, see Malysheva et al. 2011, Antonín et al. 2019 (new combination, phylogeny), new spp. see Latha et al. 2015b (India, phylogeny), Dutta et al. 2018 (India, phylogeny).

Clitolyophyllum E. Sesli, Vizzini & Contu 2016, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. akcaabatense* E. Sesli, Vizzini & Contu, Turkey, on the bark of *Picea orientalis*, sequence data available, see Sesli et al. 2016 (taxonomy).

Clitopaxillus G. Moreno, Vizzini, Consiglio & P. Alvarado 2018, Pseudoclitocybaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *C. alexandri* (Gillet) G. Moreno, Vizzini, Consiglio & P. Alvarado, sequence data available, see Alvarado et al. 2018b (genus accepted, phylogeny).

Clitopilopsis Maire 1937, Entolomataceae, Agaricales, Agaricomycetes, asexual morph unknown, two speceis, type species *C. hirneola* (Fr.) Kühner, known only in the northern hemisphere, saprobes, sequence data available, see Kluting et al. 2014 (phylogeny, new combination).

Clitopilus (Fr. ex Rabenh.) P. Kumm. 1871, Entolomataceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 140 species, type species *C. prunulus* (Scop.) P. Kumm., saprophytic, worldwide, some species edible (*C. prunulus* (Scop.) P. Kumm.), see Hall et al. 2003 (edible mushrooms), Horak 2008 (New Zealand, monograph), Dai et al. 2010b (Chinese edible mushrooms), Noordeloos and Gates 2012b (Tasmania, Australia, morphology, monograph), Kirk et al. 2013 (genus accepted), sequence data available, see Co-David et al. 2009 (new combination, phylogeny), Cooper 2014b (phylogeny), Kluting et al. 2014 (phylogeny), Morgado et al. 2016a (phylogeny, new sp.), new spp. see Roux et al. 2010 (France), Vizzini et al. 2011e (Switzerland), Crous et al. 2012 (Australia), Blanco-Dios 2013a (Spain), Deng et al. 2013a, b (China), Jatuwong et al. 2017 (Thailand), Wang et al. 2017a (China), Raj and Manimohan 2018 (India, taxonomy).

Coccidiodictyon Oberw. 1989, Septobasidiaceae, Septobasidiales, Pucciniomycetes, one species, type species *C. inconspicuum* Oberw., Spain, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Coccobotrys Boud. & Pat. 1900, *incertae sedis*, Agaricales, Agaricomycetes, sexual morph *Leucoagaricus* Locq. ex Singer 1948, two species, type species *C. xylophilus* (Fr.) Boud. & Pat., Europe, Chile, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Colacogloea Oberw. & Bandoni 1991, Colacogloeaceaea, *incertae sedis*, Microbotryomycetes, sexual and asexual morphs known, 13 species, type species *C. peniophorae* Oberw. & Bandoni, yeast, gelatinous basidiocarps, mycoparasite, worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Kirk et al. 2013 (genus accepted), Wang et al. 2015e (emendation, reclassification), Yurkov et al. 2016 (new spp.).

Colacosiphon R. Kirschner, R. Bauer & Oberw. 2001, Cryptomycocolacaceae, Cryptomycocolacales, Cryptomycocolacomycetes, presumably anamorphic (the authors indicated that the interpretation of the sporogenous cells is ambiguous), one species, type species *C. filiformis* R. Kirschner, R. Bauer & Oberw., mycoparasitic on ascomycetes, in barkbeetles in coniferous wood, Germany, see Kirschner et al. 2001 (morphology), sequence data available, see Aime et al. 2006 (phylogeny), Bauer et al. 2006 (phylogeny), Aime et al. 2014 (phylogeny).

Coleopuccinia Pat. 1889 (= *Coleoma* Clem. 1909), *incertae sedis*, Pucciniales, Pucciniomycetes, one species, type species *C. sinensis* Pat., biotrophic on Rosaceae, terrestrial, China, see Kirk et al. 2013 (genus accepted), sequence data available, see Cao et al. 2018 (not the synonym of *Gymnosporangium*).

Coleopucciniella Hara ex Hirats. 1937 (= *Coleopucciniella* Hara 1936), Pucciniaceae, Pucciniales, Pucciniomycetes, two species, type species *C. simplex* (Dietel) Hara ex Hirats., biotrophic on Rosaceae, terrestrial, China, Japan, see Cummins and Hiratsuka 2003 (synonym of *Gymnosporangium*), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Coleosporium Lév. 1847 (= *Erannium* Bonord. 1860, = *Stichopsora* Dietel 1899 [1900], = *Synomyces*

Arthur 1924), Coleosporiaceae, Pucciniales, Pucciniomycetes, c. 125 species, lectotype species *C. campanulae* (F. Strauss) Tul., biotrophic on numerous hosts including Asteraceae, Campanulaceae, Orobanchaceae, Ranunculaceae, Pinaceae (alternate hosts), terrestrial, Asia, Central America, North America South America, Europe, New Zealand, see Baiswar et al. 2008 (*C. plumeriae* on *Plumeria alb*a, India), Holcomb and Aime 2010 (*C. plumeriae* on *Plumeria* spp., Louisiana, Malaysia), Wang et al. 2011 (rust disease, China, Vietnam), Su et al. 2012 (disease outbreak), Helfer 2013 (description of *C. tussilaginis* formae speciales, Europe), Kirk et al. 2013 (genus accepted), sequence data available, see Chappell 2010 (Coevolution, *Ipomoea-Coleosporium*), Dixon et al. 2010 (phylogeny, rust fungi on sugarcane), Chappell and Rausher 2011 (genetics, *C. ipomoeae*), see Back et al. 2014 (*C. asterum* on *Solidago virgaurea* var. *gigantea*, Ulleungdo), Beenken et al. 2017 (phylogeny), new spp. see You et al. 2010 (China).

Collybia (Fr.) Staude 1857, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *C. tuberosa* (Bull.) P. Kumm., Australia, most of the species transferred to *Gymnopus* and *Rhodocollybia*, see Kirk et al. 2013 (genus accepted), sequence data available, see Hughes et al. 2001 (phylogeny), Walther et al. 2005 (conidiogenesis Agaricales), Antonín and Noordeloos 2010 (Europe), Dentinger et al. 2011 (DNA barcode).

Colospora Miettinen & Spirin 2015, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *C. andalasii* Miettinen & Spirin, basidioma corticioid, resupinate, hymenophore spiny, wood-rotting, white rot, widespread, sequence data available, see Ariyawansa et al. 2015 (taxonomy, phylogeny, Indonesia).

Coltricia Gray 1821, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, 40 species, type species *C. perennis* (L.) Murrill, basidioma stipitate, hymenophore poroid, ectomycorrhizal, soil and wood-rotting, see Tedersoo et al. 2007 (ectomycorrhizas of *Coltricia*, Seychelles), Kirk et al. 2013 (genus accepted), widespread, sequence data available, new spp. see Baltazar et al. 2010 (Brazil), Dai 2010b, 2012b (China), Baltazar and Silveira 2012 (India), Dai and Li 2012 (type study, South East Asia), Decock 2013 (São Tomé), Zhou and Tedersoo 2013 (Australia), Bian et al. 2016a (China), Bian and Dai 2017 (China).

Coltriciella Murrill 1904, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, 13 species, type species *C. dependens* (Berk. & M.A. Curtis) Murrill, basidioma resupinate to stipitate, soil and wood-rotting, ectomycorrhizal, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Dai et al. 2011, 2014a (China), Valenzuela et al. 2011 (Mexico), Dai 2012 (China), Bian and Dai 2017 (China).

Columnodontia Jülich 1979, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *C. resupinata* Jülich, basidioma resupinate, hymenophore hydnoid, wood-rotting, Southeast Asia, Australasia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Colus Cavalier & Séchier 1835, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, four species, type species *C. hirudinosus* Cavalier & Séchier, terrestrial, saprobic, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Harrower et al. 2011 (phylogeny).

Conchomyces Overeem 1927, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *C. verrucisporus* Overeem, Indonesia, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny).

Confertextum Priyanka & Dhingra 2014, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, two species, type species *C. macrosporum* Priyanka & Dhingra, Australia, sequence data unavailable, see Dhingra 2014 (taxonomy).

Conferticium Hallenb. 1980, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, four species, type species *C. insidiosum* (Bourdot & Galzin) Hallenb., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Vu et al. 2019 (DNA barcodes).

Conidiosporomyces Vánky 1992, Tilletiaceae, Tilletiales, Exobasidiomycetes, three species, type species *C. ayresii* (Berk.) Vánky & R. Bauer, plant parasites (ovaries) on genera *Megathyrsus*, *Panicum* and *Setaria* (Poaceae), widespread in tropics and subtropics, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014, Wang et al. 2015c, Jiang and Kirschner 2016.

Coniferiporia L.W. Zhou & Y.C. Dai 2016, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, three species, type species *C. qilianensis* (L.W. Zhou & Y.C. Dai) L.W. Zhou & Y.C. Dai, wood-rotting, forest pathogen, sequence data available, see Zhou et al. 2016d (taxonomy, phylogeny).

Coniodictyum Har. & Pat., 1909, Cryptobasidiaceae, Exobasidiales, Exobasidiomycetes, one species, plant parasite (leaves, branches, fruits) on *Zyzyphus mucronatum* (Rhamnaceae), Southern Africa, cultures available, sequence data available, see Begerow et al. 2002, Maier et al. 2006, Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Coniolepiota Vellinga 2011, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. spongodes* (Berk. & Broome) Vellinga,

agaricoid, south east Asia, terrestrial, saprotrophic, sequence data available, see Vellinga et al. 2011 (genus introduced), Hosen and Yang 2013 (Bangladesh, China).

Coniophora DC. 1815, Coniophoraceae, Boletales, Agaricomycetes, asexual morph unknown, 20 species, type species *C. membranacea* DC., saprobic, widespread, some species pathogenic (brown-rot fungus *C. puteana* (Schumach.) P. Karst.), see Irbe et al. 2011 (pathogen), Kirk et al. 2013 (genus accepted), sequence data available, see Skrede et al. 2012 (cryptic species, genome), Rhoden et al. 2013 (ecology).

Coniophoropsis Hjortstam & Ryvarden 1986, Coniophoraceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *C. obscura* Hjortstam & Ryvarden, Argentina, Vietnam, see Kirk et al. 2013 (genus accepted), sequence data available, see Zhao et al. 2018b (new spp., Vietnam, phylogeny).

Connopus R.H. Petersen 2010, Omphalotaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. acervatus* K.W. Hughes, Mather & R.H. Petersen, on wood, Europe, North America, basidioma collybioid or mycenoid, sequence data available, see Hughes et al. 2010 (taxonomy).

Conocybe Fayod 1889, Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 221 species, type species *C. tenera* (Schaeff.) Fayod, saprotrophic, dung fungi, worldwide, see Kirk et al. 2013 (genus accepted), Amandeep et al. 2015a (India), sequence data available, see Hallen et al. 2003 (phylogeny, toxicity), Hausknecht et al. 2009 (monograph, morphology, Europe), Tóth et al. 2013 (phylogeny), Wang and Tzean 2015 (China, phylogeny), new spp. see Gubitz 2008 (Germany), Hausknecht et al. 2009 (temperate Asia), Tkalcec et al. 2009 (Croatia), Hausknecht and Krisai-Greilhuber 2010 (Austria), Hausknecht et al. 2011 (Norway), Watling et al. 2011 (Turkey), Malysheva 2012, 2013, 2017a, b (Russia), Liu and Bau 2018 (China).

Conohypha Jülich 1975, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *C. albocremea* (Höhn. & Litsch.) Jülich, basidioma resupinate, wood-rotting, Europe, USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Contumyces Redhead, Moncalvo, Vilgalys & Lutzoni 2002, Rickenellaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, three species, type species *C. rosellus* (M.M. Moser) Redhead, Moncalvo, Vilgalys & Lutzoni, Europe, sequence data available, see Lutzoni et al. 2002 (phylogeny), Antonín and Noordeloos 2004 (Europe).

Coprinellus P. Karst. 1879, Psathyrellaceae, Agaricales, Agaricomycetes, asexual morph *Hormographiella* Guarro & Gené, 70 species, type species *C. deliquescens* (Bull.) P. Karst., saprobic, worldwide, ink caps, some species cause white rot (*C. disseminatus* (Pers.) J.E. Lange), can be pathogenic for human (*Hormographiella aspergillata* Guarro, Gené & De Vroey), or mycorrhizal (Yagame et al. 2013, phylogeny, symbiotic ability), see Uljé 2005 (morphology, monograph, *Coprinus s. l.*), Singh et al. 2009 (biochemical), Schafer 2010 (key to sections), Nagy et al. 2010b (phylogeny, evolution, Psathyrellaceae), Nagy et al. 2011 (phylogeny, evolution, Psathyrellaceae), Kirk et al. 2013 (genus accepted), sequence data available, see Nagy et al. 2012a, b (phylogeny, morphology, evolution, new spp.), Örstadius et al. 2015 (phylogeny, Psathyrellaceae, new sp.), new spp. see Házi et al. 2010 (Sweden), Gomes and Wartchow 2014, 2018 (Brazil), Huang and Bau 2018 (China), Hussain et al. 2018b (Pakistan).

Coprinopsis P. Karst. 1881, Psathyrellaceae, Agaricales, Agaricomycetes, asexual morph *Rhacophyllus* Berk. & Broome 1871 (see Redhead et al. 2000), c. 150 species, type species *C. friesii* (Quél.) P. Karst., sapbrobic, worldwide, ink caps, see Uljé 2005 (morphology, monograph, *Coprinus s. l.*), Schafer 2010 (key to sections), Kirk et al. 2013 (genus accepted), sequence data available, see Nagy et al. 2010b, 2011 (phylogeny, evolution, Psathyrellaceae), Stajich et al. 2010 (genome), Örstadius et al. 2015 (phylogeny, Psathyrellaceae, new sp.), new spp. see Fukiharu et al. 2011, 2013, 2014, 2015 (New Zealand, China, Japan), Raut et al. 2011 (Canada), Nagy et al. 2013 (Hungary, phylogeny), Desjardin and Perry 2016 (Republic of São Tomé and Príncipe), Crous et al. 2017a (Spain), Gierczyk et al. 2017 (Poland), Tibpromma et al. 2017 (Croatia), Crous et al. 2018b (Croatia), Hyde et al. 2019 (Libya).

Coprinus Pers. 1797, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 17 species, type species *C. comatus* (O.F. Müll.) Pers., saprobic, worldwide, ink caps, some species edible (*C. comatus* (O.F. Müll.) Pers.), see Hall et al. 2003 (edible mushrooms), Kirk et al. 2013 (genus accepted), sequence data available, see Ko et al. 2001 (phylogeny), Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), new spp. see Crous et al. 2016a (Spain, phylogeny), Phookamsak et al. 2019 (Saudi Arabia, phylogeny).

Cora Fr. 1825, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, 189 species, type species *C. pavonia* (Sw.) Fr. see Lücking et al. 2013 (nomenclatural discussion), Kirk et al. 2013 (genus accepted), lichen-forming, Neotropic, Asia, see Lücking et al. 2017 (new species, phylogeny, sequence data, worldwide).

Coralloderma D.A. Reid 1965, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *C. acroleucum* (Pat.) D.A. Reid, wood-rotting, Asia, Australia, sequence data unavailable, see Welden 2010 (new combination, morphology, Neotropics), Kirk et al. 2013 (genus accepted).

Corallofungus Kobayasi 1983, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph unknown, two species, type species *C. hatakeyamanus* Kobayasi, Japan, in need of modern interpretation, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Corella Vain. 1890, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *C. brasiliensis* Vainio, lichen-forming, Neotropic, see Lücking et al. 2013 (key for species), Kirk et al. 2013 (genus accepted), sequence data available, see Lücking et al. 2017 (phylogeny).

Corbulopsora Cummins 1940, Pucciniaceae, Pucciniales, Pucciniomycetes, three species, type species *C. clemensiae* Cummins, biotrophic on Asteraceae, terrestrial, India, New Guinea, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Corditubera Henn. 1897, *incertae sedis*, Boletales, Agaricomycetes, asexual morph unknown, five species, type species *C. staudtii* Henn., Africa (tropical), see Kirk et al. 2013 (genus accepted), sequence data available, see Smith and Schmull 2011 (tropical Asia, tropical truffles, review).

Cordochaete Sanyal, Samita, Dhingra & Avneet P. Singh 2013, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *C. cystidiata* S.K. Sanyal, Samita, Dhingra & Avneet P. Singh, corticioid basidioma, wood-rotting, India, sequence data unavailable, see Sanyal et al. 2013 (India, morphology).

Coriolopsis Murrill 1905, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 19 species, type species *C. occidentalis* (Klotzsch) Murrill, worldwide, sequence data available, see Nogueira-Melo et al. 2012 (Brazil), Hattori and Sotome 2013 (new combinations), Cui et al. 2019 (taxonomy, phylogeny).

Corneriella Sánchez-García 2014, Tricholomataceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *C. bambusarum* (Desjardin & Hemmes) Sánchez-García, Hawaii, Malaysia, India, sequence data available, see Sánchez-García et al. 2014 (monograph, phylogeny), new spp. see Raj et al. 2015 (India).

Corneroboletus N.K. Zeng & Zhu L. Yang 2012, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *C. indecorus* (Massee) N.K. Zeng & Zhu L. Yang, stipitate-pileate, southeastern Asian, sequence data available, see Zeng et al. 2012 (monograph), Included in *Hemileccinum* by Wu et al. 2016f.

Corneromyces Ginns 1976, *incertae sedis*, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *C. kinabalui* Ginns, Sabah, saprobes, terrestrial, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Corneroporus T. Hatt. 2001, Bankeraceae, Thelephorales, Agaricomycetes, asexual morph unknown, one species, type species *C. subcitrinus* (Corner) T. Hatt., Asia, on soil, sequence data unavailable, see Kirk et al. 2008.

Coronicium J. Erikss. & Ryvarden 1975, Pterulaceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *C. gemmiferum* (Bourdot & Galzin) J. Erikss. & Ryvarden, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2004 (phylogeny, corticioid homobasidiomycetes).

Corticirama Pilát 1957, Corticiaceae, Corticiales, Agaricomycetes, asexual morph unknown, two species, type species *C. petrakii* Pilát, saprobes, clavarioid, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Corticium Pers. 1794, Corticiaceae, Corticiales, Agaricomycetes, asexual morph unknown, 25 species, type species *C. roseum* Pers., wood-rotting, widespread, *C. silviae* is lichenicolous on *Thamnolia*, see Kirk et al. 2013 (genus accepted), Diederich et al. 2018b (lichenicolous), sequence data available, see Vu et al. 2019 (DNA barcodes).

Corticomyces A.I. Romero & S.E. López 1989, *incertae sedis*, *incertae sedis*, Agaricomycetes, sexual morph Agaricomyces, one species, type species *C. xenasmatoides* A.I. Romero & S.E. López, Argentina, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cortinarius (Pers.) Gray 1821, Cortinariaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 2250 species, type species *C. violaceus* (L.) Gray, seven subgenera: *Cortinarius* (Pers.) Gray, *Dermocybe* (Fr.) Trog, *Leprocybe* MM Moser., *Myxacium* (Fr.) Trog, *Phlegmacium* (Fr.) Trog, *Sericeocybe* Rob. Henry, *Telamonia* (Fr.) Wünsche, ectomycorrhizal, terrestrial, worldwide, some species poisonous (*C. gentilis* (Fr.) Fr., *C. orellanus* Fr. and *C. speciosissimus* Kühner & Romagn), see Michelot and Tebbett 1990, Kirk et al. 2013 (genus accepted), sequence data available, see Ortega et al. 2008 (section: *Calochroi*, Europe), Garnica et al. 2009 (section: *Calochroi*, phylogeny), Niskanen et al. 2009, 2011 (section: *Brunnei*, section: *Armillati*, Europe), Suárez-Santiago et al. 2009 (section: *Hydrocybe*, Europe), Garnica et al. 2011 (section: *Calochroi*, phylogeny), Harrower et al. 2011 (Canada), Niskanen et al. 2013a (section: *Bovini*), Liimatainen et al. 2014 (subgenus: *Phlegmacium*), Stensrud et al. 2014 (North European), Cripps et al. 2015 (subgenus *Phlegmacium*, western North America), Harrower et al. 2015 (section: *Cortinarius*, phylogeny), new spp. see Gasparini and Soop 2008 (Oceania), Niskanen et al. 2012, 2013a, b (Europe, North America), Bojantchev 2013 (USA), Stefani et al. 2014 (subgenus: *Dermocybe*, Australia), Fernández-Brime et al. 2014 (subgenus: *Phlegmacium*, Europe), Brandrud et al. 2015 (Norway), Liimatainen et al. 2015

(section: *Disjungendi*, cryptic species), Dima et al. 2016 (northern Europe).

Costatisporus T.W. Henkel & M.E. Sm. 2015, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *C. cyanescens* T.W. Henkel & M.E. Sm., sequestrate, Guyana, sequence data available, see Smith et al. 2015 (taxonomy).

Cotylidia P. Karst. 1881, Rickenellaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, ten species, type species *C. undulata* (Fr.) P. Karst., basidioma stipitate, confluent, hymenophore smooth, soil and wood-rotting, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Sjökvist et al. 2012 (phylogeny).

Crassisporium Matheny, P.-A. Moreau & Vizzini 2014, Crassisporiaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *C. funariophilum* (M.M. Moser) Matheny, P.-A. Moreau & Vizzini, worldwide, sequence data available, see Matheny et al. 2015 (taxonomy), Vizzini et al. 2019 (phylogeny and taxonomy).

Craterellus Pers. 1825, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph unknown, c. 80 species, type species *C. cornucopioides* (L.) Pers., no infrageneric subdivision proposed, see Hembrom et al. 2017a, ectomycorrhizal, terrestrial, worldwide, commercially important edible species, see Boa 2004, Kirk et al. 2013 (genus accepted), sequence data available, see Dahlman et al. 2000 (genus delimitation), Wilson et al. 2012a, Henkel et al. 2014b (Guyana), new spp. see Kumari et al. 2012, Olariaga et al. 2009 (typification *Pseudocraterellus*), Buyck et al. 2010b (USA, new recombinations), Henkel et al. 2014b (Guyana), Sá et al. 2014 (Brazil), Das et al. 2017c (India), Hembrom et al. 2017a (India, synonymy *Pterygellus*).

Crepidotus (Fr.) Staude 1857, Crepidotaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 200 species, type species *C. mollis* (Schaeff.) Staude, worldwide, basidioma pileate, hymenophore lamellate, saprotrophic, mostly wood-rotting, only some species on soil, one species biotrophic on fruitbodies of *Craterellus lutescens* (Fr.) Fr., see Kirk et al. 2013 (genus accepted), sequence data available, see Petersen et al. 2010 (phylogeny), new spp. see Bandala et al. 2008a, b (Mexico, Spain), Consiglio et al. 2008 (monograph, Europe, new sp.), Hausknecht and Krisai-Greilhuber 2009 (Austria, monograph, morphology), Capelari 2011 (Brazil), Kasuya and Kobayashi 2011 (Japan, type studies, morphology), Yang and Bau 2014 (China), Desjardin and Perry 2016 (São Tomé and Príncipe, Africa), Ge et al. 2017 (China), Guzmán-Dávalos et al. 2017 (India, Thailand, phylogeny, morphology), Horak 2018 (monograph, New Zealand, new sp.), Kumar et al. 2018a, 2018b (India, phylogeny).

Cribbea A.H. Sm. & D.A. Reid 1962, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *C. gloriosa* (D.A. Reid) A.H. Sm. & D.A. Reid, worldwide, basidiomas sequestrate, see Kirk et al. 2013 (genus accepted), sequence data available, see Lebel and Catcheside 2009 (phylogeny, Australia).

Crinipellis Pat. 1889, Marasmiaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 65 species, type species *C. stipitaria* (Fr.) Pat., saprophytic and parasitic, worldwide, see Takahashi 2011 (Japan), Antonín 2012 (tropical Africa, monograph), Bandala et al. 2012b (Mexico), Kirk et al. 2013 (genus accepted), sequence data available, see Kerekes and Desjardin 2009 (monograph, Southeast Asia), Antonín and Noordeloos 2010 (Europe), Antonín et al. 2014b (Korea, phylogeny), new spp. see Antonín and De Kesel 2012 (Benin), Antonín et al. 2015a (Italy), Xia et al. 2015 (China), Crous et al. 2016b (India).

Cristinia Parmasto 1968, Stephanosporaceae, Agaricales, Agaricomycetes, asexual morph unknown, ten species, type species *C. helvetica* (Pers.) Parmasto, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2010 (phylogeny, Agaricomycetidae), Lebel et al. 2015 (biodiversity of *Stephanospora*).

Crocinoboletus N.K. Zeng, Zhu L. Yang & G. Wu 2014, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *C. rufoaureus* (Massee) N.K. Zeng, Zhu L. Yang & G. Wu, stipitate-pileate, Japan, subtropical and tropical China, Singapore, Malaysia, possibly Indonesia, Papua New Guinea and Australia, see Zeng et al. 2014 (morphology study), sequence data available, see Wu et al. 2014b (phylongeny).

Cronartium Fr. 1815, Cronartiaceae, Pucciniales, Pucciniomycetes, 34 species, type species *C. asclepiadeum* (Willd.) Fr., biotrophic on Asclepiadaceae, Pinanceae (alternate host), causal agent of fusiform rust disease in pines, see Zhang et al. 2010c (blister rust, China), Kaitera et al. 2012 (alternate host ranges), terrestrial, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Anderson et al. 2010 (Genome size, *C. quercuum* f. sp. *fusiforme*), Samils et al. 2011 (new genetic markers, *Cronartium flaccidum*, *Peridermium pini*), Liu and Hambleton 2013 (transcriptome analysis, *Pinus monticola*, host resistance, *C. ribicola*).

Crossopsora Syd. & P. Syd. 1919 [1918], Phakopsoraceae, Pucciniales, Pucciniomycetes, 16 species, type species *C. ziziphi* (Syd., P. Syd. & E.J. Butler) Syd. & P. Syd., biotrophic on Apocynaceae, Asclepiadaceae, Asteraceae, Bixaceae, Fabaceae, Lamiaceae, Moraceae, Piperaceae, Rhamnaceae, Solanaceae, terrestrial, circumglobal in tropics, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Crucibulum Tul. & C. Tul. 1844, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, seven

species, type species *C. vulgare* Tul. & C. Tul., worldwide, bird's nests fungi, saprotrophic, see Kirk et al. 2013 (genus accepted), sequence data available, see da Vu et al. 2019 (DNA barcodes).

Cruciger R. Kirschner & Oberw. 1999, *incertae sedis*, *incertae sedis*, Agaricomycetes, sexual morph unknown, one species, type species *C. lignatilis* R. Kirschner & Oberw., Germany, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Crucispora E. Horak 1971, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, *C. naucorioides* E. Horak, New Zealand, Asia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cruentomycena R.H. Petersen, Kovalenko & O.V. Morozova 2008, Mycenaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *C. viscidocruenta* (Cleland) R.H. Petersen & Kovalenko, Austrialia, Europe, America, on fallen twigs and associated leaf fragments, basidioma mycenoid, sequence data available, see Petersen et al. 2008 (monograph), new spp. see Takahashi et al. 2016 (Japan).

Crustoderma Parmasto 1968, Sparassidaceae, Polyporales, Agaricomycetes, asexual morph unknown, 16 species, type species *C. dryinum* (Berk. & M.A. Curtis) Parmasto, basidioma resupinate, hymenophore smooth, wood-rotting, causal agent of brown rot [*C. dryinum* (Berk. & M.A. Curtis) Parmasto], widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Ortiz-Santana et al. 2013 (phylogeny, antrodia clade), Justo et al. 2017 (phylogeny, Polyporales).

Crustodontia Hjortstam & Ryvarden 2005, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *C. chrysocreas* (Berk. & M.A. Curtis) Hjortstam & Ryvarden, basidioma resupinate, hymenophore smooth, tuberculate or odontioid, wood-rotting, widespread, sequence data available, see Binder et al. 2013 (phylogeny, Polyporales), Justo et al. 2017 (phylogeny, Polyporales).

Crustomyces Jülich 1978, Cystostereaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *C. subabruptus* (Bourdot & Galzin) Jülich, basidioma resupinate, wood-rotting, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Rosenthal et al. 2017 (ecology, corticioid fungi in North American pinaceous forests).

Cryptococcus Vuill. 1901 (=*Filobasidiella* Kwon-Chung 1976), Cryptococcaceae, Tremellales, Tremellomycetes, sexual and asexual morphs known, tewlve species, type species *C. neoformans* (San Felice) Vuill., yeast, pathogenic to mammals, pathogen in humans, widespread, see Kurtzman et al. 2011 (taxonomy), Hagen et al. 2017 (nomenclature review), cultures and sequence data available, see Kurtzman et al. 2011 (taxonomy), Hagen et al. 2015 (taxonomy), Liu et al. 2015b (emendation, taxonomy and phylogeny), Passer et al. 2019 (new species, genomic analyses).

Cryptomarasmius T.S. Jenkinson & Desjardin 2014 (= *Marasmius* sect. *Hygrometrici* Kühner *fide* Jenkinson et al. 2014), Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, 15 species, type species *Marasmius hygrometricus* (V. Brig.) Sacc. (current name *Cryptomarasmius corbariensis* (Roum.) T.S. Jenkinson & Desjardin), worldwide, sequence data available, see Antonín and Noordeloos 2010 (Europe, as *Marasmius* sect. *Hygrometrici*), Jenkinson et al. 2014 (taxonomy).

Cryptomphalina R. Heim 1966, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *C. sulcata* R. Heim, wood-rotting, Thailand, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cryptomycocolax Oberw. & R. Bauer 1990, Cryptomycocolacaceae, Cryptomycocolacales, Cryptomycocolacomycetes, yeast stage observed from budding meiospores, one species, type species, *C. abnormis* Oberw. & R. Bauer, mycoparasitic on ascomycetes, Costa Rica, sequence data available, see Bauer et al. 2006 (phylogeny), Aime et al. 2014 (phylogeny).

Cryptoporus (Peck) Shear 1902, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *C. volvatus* (Peck) Shear, basidioma piletae, hymenophore poroid with volva-like structure, wood-rotting, white rot, widespread (Asia and North America), see Kirk et al. 2013 (genus accepted), sequence data available, see Hibbett and Binder 2002 (phylogeny).

Cryptotrichosporon Okoli & Boekhout 2007, Tetragoniomycetaceae, Trichosporonales, Tremellomycetes, sexual morph unknown, five species, type species *C. anacardii* Okoli & Boekhout, yeast, worldwide, cultures and sequence data available, see Kurtzman et al. 2011 (taxonomy), Liu et al. 2015a (taxonomy and phylogeny), Pontes et al. 2017, Kaewwichian et al. 2018 (new spp.).

Cumminsiella Arthur 1933, Pucciniaceae, Pucciniales, Pucciniomycetes, eight species, type species *C. sanguinea* (Peck) Arthur, biotrophic on Berberidaceae (*Berberis*, *Mahonia*), terrestrial, North and South America (*C. mirabilissima* introduced to other areas), Mahoni rust [*C. mirabilissima* (Peck) Nannf.], see Ruske and Dörfelt 2010 (history of the *Mahonia* rust), Kirk et al. 2013 (genus accepted), sequence data available, see Van Der Merwe et al. 2008 (phylogeny, *Puccinia*/*Uromyces* rust).

Cumminsina Petr. 1955, Raveneliaceae, Pucciniales, Pucciniomycetes, one species, type species *C. clavispora* Petr., biotrophic on Tiliaceae (*Grewia*), terrestrial, Angola, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cunninghammyces Stalpers 1985, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *C. umbonatus* (G. Cunn.) Stalpers, New Zealand, Réunion, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cuphophyllus (Donk) Bon 1985, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 25 species, type species *C. pratensis* (Fr.) Bon, four sections: section *Fornicati*, section *Adonidum*, section *Cuphophyllus*, section *Virginei*, Waxcaps, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Dentinger et al. 2011 (DNA barcode), Osmundson et al. 2013 (DNA barcode), Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae), new spp. see Crous et al. 2017b (Ecuador, South America).

Cupreoboletus Simonini, Gelardi & Vizzini 2015, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *C. poikilochromus* (Pöder, Cetto & Zuccherelli) Simonini, Gelardi & Vizzini, in warm regions bordering the Mediterranean basin, associated with members of Fagaceae (*Quercus*), sequence data available, see Gelardi et al. 2015a (taxonomy).

Curvibasidium Samp. & Golubev 2004, *incertae sedis*, *incertae sedis*, Microbotryomycetes, sexual and asexual morphs unknown, three species, type species *C. cygneicollum* J.P. Samp., yeast, worldwide, cultures and sequence data available, see Sampaio et al. 2004 (description), Kurtzman et al. 2011 (taxonomy), Wang et al. 2015e (taxonomy and phylogeny), new spp. see Bourret et al. 2012 (on wine grapes, Washington state).

Cutaneotrichosporon X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Trichosporonaceae, Trichosporonales, Tremellomycetes, sexual morph unknown, 15 species, type species *C. cutaneum* (Beurm., Gougerot & Vaucher bis) X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, on wood, human skin, worldwide, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny), Takashima et al. 2018 (taxonomy and phylogeny).

Cyanoboletus Gelardi, Vizzini & Simonini 2014, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, seven species, type species *C. pulverulentus* (Opat.) Gelardi, Vizzini & Simonini, stipitate-pileate, ectomycorrhizal, Europe, Asia, North America, some species edible (*C. pulverulentus* edible), see Bessette et al. 2017, sequence data available, see Wu et al. 2016e (phylogeny, new combination and new spp., Asia), new spp. see Li et al. 2016b (Asia).

Cyanodontia Hjortstam 1987, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *C. spathulata* Hjortstam, resupinate basidioma, hydnoid hymenophore, wood-rotting, East Africa (Tanzania), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cyanosporus McGinty 1909, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *C. caesius* (Schrad.) McGinty, wood-rotting, sequence data unavailable, see Kirk et al. 2008.

Cystidiopostia B.K. Cui, L.L. Shen & Y.C. Dai 2019, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *C. hibernica* (Berk. & Broome) B.K. Cui, L.L. Shen & Y.C. Dai, Europe, China, wood-rotting, sequence data available, see Shen et al. 2019 (taxonomy, phylogeny).

Cyanotrama Ghobad-Nejhad & Y.C. Dai 2010, *incertae sedis*, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *C. rimosa* Ghobad-Nejhad & Y.C. Dai, growth on conifers, especially *Juniperus*, sequence data available, new spp. see Ghobad-Nejhad and Dai 2010 (Asia).

Cyathus Haller 1768, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. 59 species, type species *C. striatus* (Huds.) Willd., worldwide, saprotrophic, terrestrial, wood-rotting, bird's nest fungi, see Kirk et al. 2013 (genus accepted), sequence data available, see Zhao et al. 2007 (phylogeny), new spp. see Trierveiler-Pereira et al. 2009 (Brazil), da Cruz and Baseia 2014 (Brazil), Poinar 2014 (fossil), Das et al. 2015b (India), Martin et al. 2015 (Cape Verde Archipelago), Crous et al. 2016b (Spain), Hyde et al. 2016 (Thailand), Sharma 2016 (India), da Silva et al. 2016 (phylogeny), Crous et al. 2017a, b (Brazil), Góis et al. 2018 (Costa Rica).

Cyclocybe Velen. 1939, Tubariaceae, Agaricales, Agaricomycetes, asexual morph unknown, ten species, type species *C. erebia* (Fr.) Vizzini & Matheny, worldwide, sequence data available, see Vizzini et al. 2014a (new combination).

Cylindrobasidium Jülich 1974, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, seven species, type species *C. evolvens* (Fr.) Jülich, worldwide, wood decaying, see Kirk et al. 2013 (genus accepted), sequence available, see Floudas et al. 2015 (genome), new spp. see Dhingra 2014 (Himalaya).

Cylindrosporus L.W. Zhou 2015, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *C. flavidus* L.W. Zhou, basidioma pilete-sessile, hymenophore poroid, wood-rotting, white rot, sequence data available, see Zhou 2015b (gen. et comb. nov., segregated from *Onnia*).

Cymatella Pat. 1899, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *C. minima* Pat., Antilles, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cymatellopsis Parmasto 1985, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species,

type species *C. ilmiana* Parmasto, East Africa, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cymatoderma Jungh. 1840, Panaceae, Polyporales, Agaricomycetes, asexual morph unknown, eleven species, type species *C. elegans* Jungh., basidioma stipitate, hymenophore venous, wood-rotting, widespread (pantropical), see Kirk et al. 2013 (genus accepted), sequence data available, see Sjökvist et al. 2012 (phylogeny, stipitate stereoid fungi), Miettinen et al. 2012 (phylogeny, polypores), genus in need of revision.

Cynema Maas Geest. & E. Horak 1995, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. alutacea* Maas Geest. & E. Horak, Papua New Guinea, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cyphella Fr. 1822, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *C. digitalis* (Alb. & Schwein.) Fr., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2005 (phylogeny).

Cyphellocalathus Agerer 1981, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. cecropiae* (Singer) Agerer, Bolivia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cyphellostereum D.A. Reid 1965, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, nine species, type species *C. pusiolum* (Berk. & M.A. Curtis) D.A. Reid [current name: *Cotylidia pusiola* (Berk. & M.A. Curtis) A.L. Welden], lichenized, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Dal-Forno 2015 (basidiolichen), new spp. see Ryvarden 2010 (America), Yánez et al. 2012 (Galapagos), Lücking et al. 2013, Lücking and Timdal 2016 (new combination, tropical Africa, Indian Ocean), Dal Forno et al. 2017 (Galapagos).

Cyphobasidium Millanes, Diederich & Wedin 2016, *incertae sedis*, Erythrobasidiales, Cystobasidiomycetes, asexual morph unknown, two species, type species *C. hypogymniicola* (Diederich & Ahti) Millanes, Diederich & Wedin, lichenicolous (growing on *Hypogymnia* and *Usnea*), gall-inducing, sequence data available, see Millanes et al. 2016 (new genus, Cystobasidiomycetes).

Cyptotrama Singer 1960, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, 16 species, type species *C. macrobasidia* Singer, four sections, sect. *Cyptotrama*, sect. *Depauperata*, sect. *Xerulina* and sect. *Aporpotrama*, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Qin and Yang 2016 (monograph, Asia), new spp. see Moreau et al. 2015b (Spain).

Cyrenella Goch. 1981, *incertae sedis*, Erythrobasidiales, Cystobasidiomycetes, sexual morph unknown, dikaryotic with teliospores, one species, type species *C. elegans* Goch., aquatic, on submerged fungus, yeast, USA, see Kurtzman et al. 2011 (taxonomy), Kirk et al. 2013 (genus accepted), cultures and sequence data available, see Wang et al. 2015d, e (phylogenetic classification of yeasts, Pucciniomycotina).

Cystidiodontia Hjortstam 1983, Cystostereaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *C. artocreas* (Berk. & M.A. Curtis ex Cooke) Hjortstam, worldwide, see Kirk et al. 2013 (genus accepted), sequence data availale, see Larsson 2007b (phylogeny, corticioid fungi).

Cystoagaricus Singer 1947, Psathyrellaceae, Agaricales, Agaricomycetes, asexual morph unknown, seven species, type species *C. strobilomyces* (Murrill) Singer, subtropical America, see Kirk et al. 2013 (genus accepted), sequence data available, see Örstadius et al. 2015 (phylogeny, new combination).

Cystobasidiopsis R. Bauer, B. Metzler, Begerow & Oberw. 2009, Chionosphaeraceae, Agaricostilbales, Agaricostilbomycetes, sexual and asexual morphs known, three species, type species *C. nirenbergiae* R. Bauer, B. Metzler, Begerow & Oberw., plant material, soil, worldwide, cultures and sequence data available, see Bauer et al. 2009 (integrative taxonomy), Wang et al. 2015d, e (emended, phylogeny).

Cystobasidium (Lagerh.) Neuhoff 1924, Cystobasidiaceae, Cystobasidiales, Cystobasidiomycetes, sexual and asexual morphs known, c. 20 species, type species *C. lasioboli* (Lagerh.) Neuhoff [current name: *C. fimetarium* (Schumach.) P. Roberts], yeast, lichenicolous, worldwide, see Kurtzman et al. 2011 (taxonomy), Kirk et al. 2013 (genus accepted), cultures and sequence data available, see Sampaio and Oberwinkler 2011 (taxonomy), new spp. see Wang et al. 2015d, e (taxonomy and phylogeny), Yurkov et al. 2015 (emendation, taxonomy, phylogeny, new spp.), Tsuji et al. 2017 (East Ongul Island, East Antarctica), Chang et al. 2018 (China), Turchetti et al. 2018 (Arctic region), Fotedar et al. 2019b (Arabian Gulf).

Cystoderma Fayod 1889, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. 36 species, type species *C. amianthinum* (Scop.) Fayod, worldwide, saprotrophic, see Kirk et al. 2013 (genus accepted), sequence data available, see Saar et al. 2009 (phylogeny), Saar 2012 (monograph), new spp. see Blanco-Dios 2014a (Spain).

Cystodermella Harmaja 2002, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, 16 species, type species *C. granulosa* (Batsch) Harmaja, worldwide, saprotrophic, basidioma collybioid, sequence data available, see Saar et al. 2009, 2012, 2016 (phylogeny, taxonomy, type study).

Cystofilobasidium Oberw. & Bandoni 1983, Cystofilobasidiaceae, Cystofilobasidiales, Tremellomycetes, sexual

and asexual morphs known, eight species, type species *C. bisporidii* (Fell, I.L. Hunter & Tallman) Oberw. & Bandoni, yeast, widespread, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny), Pontes et al. 2016 (new spp., Mediterranean forest).

Cystogloea P. Roberts 2006, *incertae sedis*, *incertae sedis*, Basidiomycota, asexual morph unknown, one species, type species C. oelandica P. Roberts, Sweden, basidioma auricularioid, sequence data unavailable, see Kirk et al. 2008.

Cystogomphus Singer 1942, Gomphidiaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *C. humblotii* Singer, France (introduced), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Cystolepiota Singer 1952(= *Pulverolepiota* Bon 1993), Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. twelve species, type species *C. constricta* Singer, three sections: sect. *Cystolepiota* Singer, sect. *Pulverolepiota* (M. Bon) Vellinga, sect. *Pseudoamyloideae* Singer and Clémençon, worldwide, saprotrophic, see Kirk et al. 2013 (genus accepted), sequence data available, see Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Osmundson et al. 2013 (DNA barcode), new spp. see Kumar and Manimohan 2009b (India), Paraíso et al. 2016 (Europe), Xu et al. 2016b (China).

Cystomyces Syd. 1926, Raveneliaceae, Pucciniales, Pucciniomycetes, one species, type species *C. costaricensis* Syd., biotrophic on Fabaceae, terrestrial, Costa Rica, sequence data unavailable, see Cannon 2009 (description), Kirk et al. 2013 (genus accepted).

Cystopsora E.J. Butler 1910, Pucciniaceae, Pucciniales, Pucciniomycetes, sexual morph unknown, two species, type species *C. oleae* E.J. Butler [current name: *Zaghouania oleae* (E.J. Butler) Cummins], India, Indonesia, biotrophic on *Antidesma*, see Kirk et al. 2013 (genus accepted), sequence data available, see McTaggart et al. 2016a (evolution, host jumps, rust fungi diversity, Pucciniales).

Cystostereum Pouzar 1959, Cystostereaceae, Agaricales, Agaricomycetes, asexual morph unknown, seven species, type species *C. murrayi* (Berk. & M.A. Curtis) Pouzar, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson 2007b (phylogeny, corticioid fungi).

Cytidia Quél. 1888, Vuilleminiaceae, Corticiales, Agaricomycetes, asexual morph unknown, five species, type species *C. salicina* (Fr.) Burt, wood-rotting, widespread (North Temperate), see Kirk et al. 2013 (genus accepted), sequence data available, see Ghobad-Nejhad et al. 2010 (phylogeny).

Cytidiella Pouzar 1954, Irpicaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *C. albomellea* (Bondartsev) Parmasto, resupinate, wood-rotting, white rot, widespread, sequence data available, see Justo et al. 2017 (phylogeny), Zmitrovich 2018a (taxonomy).

Cyttarophyllopsis R. Heim 1968, Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *C. cordispora* R. Heim, India, basidioma gasteroid, sequence data unavailable, see Kirk et al. 2008.

Dacrymyces Nees 1816, Dacrymycetaceae, Dacrymycetales, Dacrymycetes, asexual morph unknown, c. 50 species, type species *D. stillatus* Nees, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Shirouzu et al. 2007, new spp. see Shirouzu et al. 2009, 2013b (Japan, New Zealand).

Dacryobolus Fr. 1849, Dacryobolaceae, Polyporales, Agaricomycetes, asexual morph unkonwn, seven species, type species *D. sudans* (Alb. & Schwein.) Fr., basidioma membranaceous to coriaceous, hymenophore smooth, odontioid or tuberculate, wood-rotting, brown rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data avaiable, see Binder et al. 2005 (phylogeny), Larsson 2007a (phylogeny, corticioid fungi), Justo et al. 2017 (phylogeny, Polyporales), new spp. see Yuan et al. 2016a (phylogeny, China).

Dacryonaema Nannf. 1947, Dacrymycetaceae, Dacrymycetales, Dacrymycetes, asexual morph unknown, one species, type species *D. rufum* (Fr.) Nannf., wood-decaying, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Dacryopinax G.W. Martin 1948, Dacrymycetaceae, Dacrymycetales, Dacrymycetes, asexual morph unknown, 24 species, type species *D. elegans* (Berk. & M.A. Curtis) G.W. Martin, wood-decaying, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Floudas et al. 2012 (genome), new spp. see Shirouzu et.al. 2009 (Japan), McLaughlin et al. 2016 (Costa Rica).

Dacryoscyphus R. Kirschner & Zhu L. Yang 2005, Dacrymycetaceae, Dacrymycetales, Dacrymycetes, one species, type species *D. chrysochilus* R. Kirschner & Zhu L. Yang, wood-decaying, China, sequence data available, see Kirschner and Yang 2005 (taxonomy).

Dactylosporina (Clémençon) Dörfelt 1985, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *D. steffenii* (Rick) Dörfelt, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Qin et al. 2014a (phylogeny), new spp. see Ushijima et al. 2015 (Japan).

Daedalea Pers. 1801, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, twelve species, type species *D. quercina* (L.) Pers., basidioma pileate, hymenophore poroid to daedaleoid, wood-rotting, brown

rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2013 (phylogeny, Polyporales), Nagy et al. 2015 (genome, *D. quercina*), new spp. see Lindner et al. 2011 (phylogeny, Belize), Drechsler-Santos et al. 2012a (morphology, Brazil), Li and Cui 2013a (phylogeny, China), Han et al. 2015, 2016a (phylogeny, North and Central America, China).

Daedaleopsis J. Schröt. 1888, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, seven species, type species *D. confragosa* (Bolton) J. Schröt., basidioma pileate, hymenophore poroid to lamellate, wood-rotting, white rot, widespread (Northern Hemisphere), see Kirk et al. 2013 (genus accepted), sequence data available, see Zmitrovich and Malysheva 2013 (new combination, phylogeny), Koukol et al. 2014 (phylogeny), Li et al. 2016c (new sp., phylogeny, tropical China).

Dasturella Mundk. & Khesw. 1943, Phakopsoraceae, Pucciniales, Pucciniomycetes, three species, type species *D. divina* (Syd.) Mundk. & Khesw. [current name: *Kweilingia divina* (Syd.) Buriticá], biotrophic on Poaceae, Rubiaceae (alternate host), Sapindaceae, terrestrial, see Kirk et al. 2013 (genus accepted), Mishra et al. 2015 (species on bamboo, India), sequence data available, see Wingßeld et al. 2004 (phylogeny).

Dasyspora Berk. & M.A. Curtis 1854 [1853] (= *Sartvellia* Berk. 1857, nom. illeg.), Uropyxidaceae, Pucciniales, Pucciniomycetes, 13 species, type species *D. foveolata* Berk. & M.A. Curtis [current name: *D. gregaria* (Kunze) Henn.], asexual morph aecidium-like, biotrophic on Annonaceae, terrestrial, Central America, northern South America, see Kirk et al. 2013 (genus accepted), sequence data available, see Beenken et al. 2012 (monograph, new spp.), Beenken and Wood 2015 (description, key, morphology, phylogeny).

Datronia Donk 1966, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, nine species, type species *D. mollis* (Sommerf.) Donk, poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Li et al. 2014b (phylogeny), new spp. see Ryvarden 2014 (morphology, tropical America), Kaur et al. 2015b (morphology, India), new combinations see Hattori and Sotome 2013 (morphology, type study, Malaysia), Ryvarden 2015d (morphology, Neotropics).

Datroniella B.K. Cui, Hai J. Li & Y.C. Dai 2014, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, six species, type species *D. scutellata* (Schwein.) B.K. Cui, Hai J. Li & Y.C. Dai, poroid hymenophore, wood-rotting, white rot, widespread, sequence data available, see Li et al. 2014b (taxonomy, new combination, phylogeny, China), de Lira et al. 2016 (new sp., phylogeny, Brazil).

Decapitatus Redhead & Seifert 2000, Mycenaceae, Agaricales, Agaricomycetes, sexual morph *Mycena* (Pers.) Roussel 1806, one species, type species *D. flavidus* (Cooke) Redhead & Seifert, sequence data unavailable, see Kirk et al. 2008.

Deconica (W.G. Sm.) P. Karst. 1879, Strophariaceae, Agaricales, Agaricomycetes, asexual morph unknown, 44 species, type species *D. montana* (Pers. : Fr.) P.D. Orton, worldwide, sequence data available, see Noordeloos 2009 (new combinations), Noordeloos 2011 (Europe, monograph), Guzmán et al. 2012 (Thailand, new combination), Ramírez-Cruz et al. 2012, 2013a, b (new combinations, type studies, new combinations, phylogeny), da Silva et al. 2013b, 2014, 2016 (Brazil, new combination, taxonomy, culthure studies), Matheny et al. 2015 (phylogeny).

Deflexula Corner 1950, Pterulaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. eleven species, type species *D. fascicularis* (Bres. & Pat.) Corner, worldwide, sequence data available, see Munkacsi et al. 2004 (coevolution, coral mushrooms), Dentinger et al. 2009 (ant-fungus mutualism).

Deigloria Agerer 1980, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *D. pulchella* Agerer, neotropics, cupulate basidiomas, on fern or stems of herbs, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Delentaria Corner 1970, Gomphaceae, Gomphales, Agaricomycetes, asexual morph unknown, one species, type species *D. decurva* Corner, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Delicatula Fayod 1889, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. three species, type species *D. integrella* (Pers.) Fayod, temperate, see Kirk et al. 2013 (genus accepted), Antonín 2003 (revision of species described by J. Velenovský; 42 species), Antonín and Noordeloos 2004 (Europe), sequence data available, see Saar et al. 2009 (phylogeny), Kim et al. 2015 (Korea).

Dendrocollybia R.H. Petersen & Redhead 2001, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph *Tilachlidiopsis* Keissl. 1924, one species, type species *D. racemosa* (Pers.) R.H. Petersen & Redhead, Australia, mycosaprobic, sequence data available, see Hughes et al. 2001, Machnicki et al. 2006 (growth on *Russula crassotunicata* Singer), Antonín and Noordeloos 2010 (Europe).

Dendrocorticium M.J. Larsen & Gilb. 1974, Punctulariaceae, Corticiales, Agaricomycetes, asexual morph unknown, nine species, type species *D. polygonioides* (P. Karst.) M.J. Larsen & Gilb., wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Ghobad-Nejhad et al. 2010, Ghobad-Nejhad and Duhem 2014 (phylogeny).

Dendrogloeon Spirin & Miettinen 2015, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown,

one species, type species *D. helenae* Spirin, Ryvarden & Miettinen, sequence data available, see Spirin et al. 2015a (St. Helena).

Dendrominia Ghobad-Nejhad & Duhem 2013, Dendrominiaceae, Corticiales, Agaricomycetes, asexual morph unknown, four species, type species *D. maculata* (H.S. Jacks. & P.A. Lemke) Ghobad-Nejhad & Duhem, wood-rotting, North America and Europe, sequence data available, new spp. see Ghobad-Nejhad and Duhem 2014 (France), Nakasone (North American), Ariyawansa et al. 2015 (phylogeny).

Dendrophlebia Dhingra & Priyanka 2011, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unkonwn, one species, type species *D. crassispora* Dhingra & Priyanka, corticioid basidioma, wood-rotting, India, sequence data unavailable, see Dhingra and Priyanka 2011 (new genus, new sp., morphology).

Dendrophora (Parmasto) Chamuris 1987, Peniophoraceae, Russulales, Agaricomycetes, asexual morph unknown, three species, type species *D. versiformis* (Berk. & M.A. Curtis) Chamuris, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Hestmark et al. 2011 (evolutionary radiation).

Dendrosporomyces Nawawi, J. Webster & R.A. Davey 1977, *incertae sedis*, *incertae sedis*, Agaricomycetes, one species, type species *D. prolifer* Nawawi, J. Webster & R.A. Davey, Malaysia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Dendrothele Höhn. & Litsch. 1907, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, 58 species, type species *D. papillosa* Höhn. & Litsch., wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Hjortstam et al. 2009 (Australia), Nakasone 2009 (North America), Pouzar and Kotlaba 2010 (Czech), Gorjón et al. 2011a (Argentina), Nakasone and Burdsall 2011 (New Zealand), Rodrigues and Guerrero 2013 (Brazil).

Dennisiomyces Singer 1955, Tricholomataceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *D. glabrescentipes* Singer, South America, see Kirk et al. 2013 (genus accepted), sequence data available, see Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae), Sánchez-García et al. 2014 (phylogeny).

Dentipellicula Y.C. Dai & L.W. Zhou 2013, Hericiaceae, Russulales, Agaricomycetes, asexual morph unknown, three species, type species *D. taiwaniana* (Sheng H. Wu) Y.C. Dai & L.W. Zhou, South Africa, China, sequence data available, see Zhou and Dai 2013a (wood-rotting hydnoid species in Russulales), new spp. see Chen et al. 2015b (China).

Dentipellis Donk 1962, Hericiaceae, Russulales, Agaricomycetes, asexual morph unknown, seven species, type species *D. fragilis* (Pers.) Donk, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Zhou and Dai 2013a (wood-inhabiting hydnoid species in Russulales), new spp. see Shen and Wang 2017 (China).

Dentipellopsis Y.C. Dai & L.W. Zhou 2013, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *D. dacrydicola* Y.C. Dai & L.W. Zhou, sequence data available, see Zhou and Dai 2013a (wood-inhabiting hydnoid species in Russulales).

Dentiporus Audet 2017, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *D. albidoides* (A. David & Dequatre) Audet, wood-rotting, sequence data available, see Audet 2017a (new genus).

Dentipratulum Domański 1965, Auriscalpiaceae, Russulales, Agaricomycetes, asexual morph unknown, three species, type species *D. bialoviesense* Domański, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Larsson 2003 (phylogeny, russuloid basidiomycetes), new spp. see Karasiński and Piątek 2017 (morphology).

Dentocorticium (Parmasto) M.J. Larsen & Gilb. 1974, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *D. ussuricum* (Parmasto) M.J. Larsen & Gilb., varied hymenophore surface (odontoid, tuberculate, spinose, poroid, daedaleoid), wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Floudas and Hibbett 2015 (phylogeny, *Phanerochaete*), Liu et al. 2018a (new combinations, phylogeny, type study).

Dermatosorus Sawada ex L. Ling 1949, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, six species, type species *D. eleocharidis* Sawada ex L. Ling, plant parasites (ovaries) on Cyperaceae, Africa, South America, East Asia, South Asia, Australia, cultures unavailable, see Kirk et al. 2013 (genus accepted), sequence data available, see Wang et al. 2015c (phylogeny).

Dermoloma J.E. Lange ex Herink 1958, Tricholomataceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 25 species, type species *D. cuneifolium* (Fr.) Singer, worldwide, saprotophic, see Kirk et al. 2013 (genus accepted), sequence data available, see Kropp 2008 (phylogeny, Belize), Sánchez-García and Matheny 2017 (evolution, phylogeny), new spp. see Contu et al. 2008 (Italy, monograph, morphology), Raj et al. 2014b (India).

Derxomyces F.Y. Bai & Q.M. Wang 2008, Bulleribasidiaceae, Tremellales, Tremellomycetes, sexual morph unknown, 24 species, type species *D. mrakii* (Hamam. & Nakase) F.Y. Bai & Q.M. Wang, yeast, worldwide, cultures and sequence data available, see Wang and Bai 2008, Liu et al. 2015b (taxonomy and phylogeny).

Desarmillaria (Herink) R. A. Koch & Aime 2017, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unkown, two species, type species *D. tabescens* (Scop.) R.A. Koch & Aime, saprotrophic to parasitic, known only from the northern hemisphere, sequence data available, see Koch et al. 2017 (evolution, taxonomy, phylogeny).

Descolea Singer 1952 (= *Descomyces* Bougher & Castellano 1993; = *Timgrovea* G. Cunn.), Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 15 species, type species *D. antarctica* Singer, worldwide, ectomycorrhizal, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny and Bougher 2006 (phylogeny), Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Tóth et al. 2013 (phylogeny, Bolbitiaceae), Kuhar et al. 2017 (phylogeny, sequestrate taxa), new spp. see Khan et al. 2017 (Pakistan).

Desmella Syd. & P. Syd. (1919) [1918], *incertae sedis*, Pucciniales, Pucciniomycetes, four species, type species *D. aneimiae* Syd. & P. Syd., biotrophic on Nephrolepidaceae, Polypodiaceae, Schizaeaceae, terrestrial, Australia, Brazil, see Kirk et al. 2013 (genus accepted), sequence data available, see McTaggart et al. 2014 (first record of fern rust in Australia, phylogeny).

Desmellopsis J.M. Yen 1969, *incertae sedis*, Pucciniales, Pucciniomycetes, one species, type species *D. aframomicola* J.M. Yen, biotrophic on Zingiberaceae (*Aframomum*), terrestrial, Africa (Gabon), see Cummins and Hiratsuka 2003 (treated as a synonym of *Puccinia*), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Desmosorus Ritschel, Oberw. & Berndt 2005, *incertae sedis*, Pucciniales, Pucciniomycetes, one species, type species *D. oncidii* Ritschel, Oberw. & Berndt, biotrophic on Orchidaceae, terrestrial, Central and South America, Europe (introduced), sequence data unavailable, see Kirk et al. 2008.

Destuntzia Fogel & Trappe 1985, Gomphaceae, Gomphales, Agaricomycetes, asexual morph unknown, five species, type species *D. rubra* (Harkn.) Fogel & Trappe, N. America, see Kirk et al. 2013 (genus accepted), sequence data available.

Deviodontia (Parmasto) Hjortstam & Ryvarden 2009, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *D. pilaecystidiata* (S. Lundell) Hjortstam & Ryvarden, wood-rotting, sequence data unavailable, see Hjortstam et al. 2009 (taxonomy).

Dextrinocystidium Sheng H. Wu 1996, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, two species, type species *D. sacratum* (G. Cunn.) Sheng H. Wu, New Zealand, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Dextrinocystis Gilb. & M. Blackw. 1988, Hydnodontaceae, Trechisporales, Agaricomycetes, asexual morph unknown, two species, type species *D. capitata* (D.P. Rogers & Boquiren) Gilb. & M. Blackw., wood-decaying, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Dextrinodontia Hjortstam & Ryvarden 1980, Hydnodontaceae, Trechisporales, Agaricomycetes, asexual morph unknown, one species, type species *D. molliuscula* Hjortstam & Ryvarden, wood-decaying, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Dextrinoporus H.S. Yuan 2018, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *D. aquaticus* H.S. Yuan, tyromycetoid basidioma, wood-rotting, white rot, see Yuan and Qin 2018 (taxonomy).

Diabole Arthur 1922, Raveneliaceae, Pucciniales, Pucciniomycetes, one species, type species *D. cubensis* (Arthur & J.R. Johnst.) Arthur, biotrophic on Fabaceae, terrestrial, Central America (Cuba, Brazil, El Salvador, Mexico), used as biological control agent [*D. cubensis* (Arthur & J.R. Johnst.) Arthur], see Burrows et al. 2012 (classical biological control agent, Australia), Kirk et al. 2013 (genus accepted), sequence data unavailable.

Diabolidium Berndt 1995, Raveneliaceae, Pucciniales, Pucciniomycetes, one species, type species *D. calliandrae* Berndt, biotrophic on Fabaceae (*Calliandra*), terrestrial, South America (Venezuela), sequence data unavailable, see Cummins and Hiratsuka 2003 (treated as a synonym of *Allotelium*), Kirk et al. 2013 (genus accepted).

Diacanthodes Singer 1945, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph *Bornetina* L. Mangin & Viala 1903, three species, type species *D. philippinensis* (Pat.) Singer [current name: *D. novoguineensis* (Henn.) O. Fidalgo], poroid hymenophore, terrestrial, widespread (pantropical), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Diaphanopellis P.E. Crane 2005, Coleosporiaceae, Pucciniales, Pucciniomycetes, two species, type species *D. forrestii* P.E. Crane, biotrophic on Ericaceae (*Rhododendron*), terrestrial, China, India, Nepal, sequence data available, see Cao et al. 2017b (new spp., phylogeny).

Dicellomyces L.S. Olive 1945, Brachybasidiaceae, Exobasidiales, Exobasidiomycetes, four species, type species *D. gloeosporus* L.S. Olive, plant parasites (leaves) on Cyperaceae and Poaceae, India, Namibia, cultures unavailable, see Kirk et al. 2013 (genus accepted), sequence data available, see Begerow et al. 2002, Wang et al. 2015c (phylogeny).

Dichantharellus Corner 1966, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, two species, type species *D. malayanus* Corner, Malaysia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Dicheirinia Arthur 1907, Raveneliaceae, Pucciniales, Pucciniomycetes, 14 species, type species *D. binata* (Berk.) Arthur, biotrophic on Fabaceae, terrestrial, Central and South America, Canary Islands, Madeira, Mauritius, New Caledonia, see de Carvalho and Hennen 2008, Beenken and Berndt 2010 (new species, new combination), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Dichochaete Parmasto 2001, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, two species, type species *D. setosa* (Sw.) Parmasto, wood-rotting, widespread, sequence data unavailable, see Kirk et al. 2008.

Dichomitus D.A. Reid 1965, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, 13 species, type species *D. squalens* (P. Karst.) D.A. Reid, poroid hymenophore, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Li and Cui 2013b (phylogeny), Floudas et al. 2012 (genome, *D. squalens*), new spp. see Ainsworth and Ryvarden 2008 (morphology, Europe), Læssøe and Ryvarden 2010a (morphology, Ecuador), Gomes-Silva et al. 2012b (morphology, Brazil), Ryvarden 2012d (morphology, Costa Rica), Li and Cui 2013c (morphology, China), Yuan 2013b (morphology, China, monograph).

Dichopleuropus D.A. Reid 1965, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *D. spathulatus* D.A. Reid, Malaysia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Dichostereum Pilát 1926, Peniophoraceae, Russulales, Agaricomycetes, asexual morph, eleven species, type species *D. durum* (Bourdot & Galzin) Pilát, worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Dictyocephalos Underw. ex V.S. White 1901, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *D. attenuatus* (Peck) Long & Plunkett, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Martin et al. 2000 (phylogeny).

Dictyonema C. Agardh ex Kunth 1822, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, 28 species, type species *D. excentricum* C. Agardh [current name *D. thelephora* (Spreng.) Zahlbr.], worldwide, lichenized, see Kirk et al. 2013 (genus accepted), sequence data available, see Lawrey et al. 2009 (phylogeny), Dal-Forno et al. 2013 (phylogeny), Lücking et al. 2013, 2016 (key, classification), new spp. see Schmull et al. 2014 (Ecuadorian Amazon region).

Dictyotremella Kobayasi 1971, *incertae sedis*, Tremellales, Tremellomycetes, asexual morph unknown, one species, type species *D. novoguineensis* Kobayasi, wood-decaying, Oceania, see Kirk et al. 2013 (genus accepted), sequence data unavailable

Didymopsora Dietel 1899, Pucciniosiraceae, Pucciniales, Pucciniomycetes, six species, type species *D. solani-argentei* (Henn.) Dietel, biotrophic on Asteraceae, Melastomataceae, Solanaceae, Tiliaceae, terrestrial, South America, Africa, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Didymopsorella Thirum. 1950 (= *Gymnopuccinia* K. Ramakr. 1951), Uropyxidaceae, Pucciniales, Pucciniomycetes, two species, type species *D. toddaliae* (Petch) Thirum., biotrophic on Rutaceae (*Toddalia*), terrestrial, Africa, India, Sri Lanka, China, Japan, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Dietelia Henn. 1897 (= *Endophylloides* Whetzel & Olive 1917; = *Jacksonia* J.C. Lindq. 1970; = *Jacksoniella* J.C. Lindq. 1972; = *Jacksoniella* Kamat & Sathe 1972; = *Thirumalachariella* Sathe 1975 [1974]), Pucciniosiraceae, Pucciniales, Pucciniomycetes, 13 species, type species *D. verruciformis* (Henn.) Henn., biotrophic on Asteraceae, Balsaminaceae, Euphorbiaceae, Malvaceae, terrestrial, south and central America, Africa (South Africa, Uganda), see Cummins and Hiratsuka 2003 (*D. codiaei* introduced to Europe), see Berndt and Wood 2012 (new combination), Kirk et al. 2013 (genus accepted), sequence data available, see Aime 2006 (phylogeny), Van der Merwe et al. 2007 (phylogeny).

Digitatispora Doguet 1962, Niaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *D. marina* Doguet, marine fungi, Europe, North America, see Kirk et al. 2013 (genus accepted), sequence data available, see Rämä et al. 2014 (marine fungi, Norway, morphology).

Dimennazyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Naemateliaceae, Tremellales, Tremellomycetes, sexual morph unknown, one species, type species *D. cisti-albidi* (Á. Fonseca, J. Inácio & Spenc.-Mart.) A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, plant material, Europe, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Diorchidiella J.C. Lindq. 1957, Raveneliaceae, Pucciniales, Pucciniomycetes, two species, type species *D. australis* (Speg.) J.C. Lindq., biotrophic on Fabaceae (*Mimosa*), terrestrial, South America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Diorchidium Kalchbr. 1882 (= *Diphragmium* Boedijn (1960) [1959]), Raveneliaceae, Pucciniales, Pucciniomycetes, 20 species, type species *D. woodii* Kalchbr. & Cooke, biotrophic on Annonaceae, Fabaceae, Poaceae, Rubiaceae, terrestrial, Africa, South America, Sri Lanka, Pakistan, China, Japan, Indonesia, see Kirk et al. 2013 (genus accepted), sequence data available, see Beenken

and Wood 2015 (phylogeny, new genera on Annonaceae, Pucciniales).

Dioszegia Zsolt 1957, Bulleribasidiaceae, Tremellales, Tremellomycetes, sexual morph unknown, 18 species, type species *D. hungarica* Zsolt, yeast, widespread, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny), Yurkov et al. 2016 (phylogeny), Trochine et al. 2017 (new spp.).

Diplocystis Berk. & M.A. Curtis 1868, Diplocystidiaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *D. wrightii* Berk. & M.A. Curtis, West Indies, see Kirk et al. 2013 (genus accepted), sequence data available, see Phosri et al. 2014 (Thailand, phylogeny).

Diplomitoporus Domański 1970, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, c. 25 species, type species *D. flavescens* (Bres.) Domański, poroid hymenophore, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Miettinen and Larsson 2011 (phylogeny), Zmitrovich and Malysheva 2013 (phylogeny), new spp. see Hjortstam and Ryvarden 2009a (morphology, Seychelles), Ryvarden and Iturriaga 2011 (morphology, Venezuela), Baltazar et al. 2014a (morphology, Brazil), Ryvarden 2018b (morphology, Ethiopia, Kenya, Uganda, Zimbabwe), new combinations see Ryvarden 2012c, 2015c (morphology, type study, Tanzania).

Dipyxis Cummins & J.W. Baxter 1967, Uropyxidaceae, Pucciniales, Pucciniomycetes, two species, type species *D. mexicana* Cummins & J.W. Baxter, biotrophic on Bignoniaceae, terrestrial, Central and South America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Dirkmeia F.Y. Bai, Q.M. Wang, Begerow & Boekhout 2015, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, one species, type species *D. churashimaensis* (T. Morita, Y. Ogura, M. Takash., N. Hirose, Fukuoka, Imura, Y. Kondo & Kitamoto) F.Y. Bai, Q.M. Wang, Begerow & Boekhout, known only from saprobic yeast morph, plant material, Japan, cultures available, sequence data available, see Wang et al. 2015c (taxonomy, phylogeny).

Disciseda Czern. 1845, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, 15 species, type species *D. collabescens* Czern., worldwide, basidioma gasteroid, see Kirk et al. 2013 (genus accepted), see da Silva and Baseia 2014 (morphology, Brazil), sequence data available, see Larsson and Jeppson 2008 (phylogeny, north Europe), Bates et al. 2009 (phylogeny, key).

Disporotrichum Stalpers 1984, *incertae sedis*, Agaricales, Agaricomycetes, one species, type species *D. dimorphosporum* (Arx) Stalpers, Netherlands, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Ditangium P. Karst. 1867, Sebacinaceae, Sebacinales, Agaricomycetes, sexual morph unknown, three species, type species *D. insigne* P. Karst., North and South America, Russia, Europe, saprobic, on rotten wood, sequence data available, see Malysheva et al. 2019 (taxonomy, phylogeny, genus accepted against *Craterocolla*).

Ditiola Fr. 1822, Dacrymycetaceae, Dacrymycetales, Dacrymycetes, asexual morph unknown, c. ten species, type species *D. radicata* (Alb. & Schwein.) Fr., wood-rotting, see Kirk et al. 2013 (genus accepted), sequence data available, see Shirouzu et al. 2013a (phylogeny, Dacrymycetes).

Doassansia Cornu 1883, Doassansiaceae, Doassansiales, Exobasidiomycetes, twelve species, plant parasites (leaves, stems, petioles) of dicots and monocots, widespread, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Wang et al. 2015c (phylogeny).

Doassansiopsis (Setch.) Dietel 1897, Doassansiopsidaceae, Urocystidales, Ustilaginomycetes, 14 species, plant parasites (leaves, ovaries, petioles, stems) on Alismataceae, Limnocharitaceae, Menianthaceae, Nymphaceae, Potamogetonaceae, widespread, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (phylogeny).

Doassinga Vánky, R. Bauer & Begerow 1998, Doassansiaceae, Doassansiales, Exobasidiomycetes, one species, type species *D. callitrichis* (Liro) Vánky, R. Bauer & Begerow, plant parasitic on *Callitriche* spp. (Callitrichaceae), Europe, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014 (taxonomy).

Donkia Pilát 1937, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *D. pulcherrima* (Berk. & M.A. Curtis) Pilát, hydnoid hymenophore, wood-rotting, widespread, sequence data available, see Justo et al. 2017 (phylogeny, Polyporales), Moreno et al. 2017b (phylogeny, type study), Papp et al. 2017a (phylogeny, Central Europe), Zmitrovich 2018a (taxonomy).

Donkioporia Kotl. & Pouzar 1973, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *D. expansa* (Desm.) Kotl. & Pouzar, poroid hymenophore, wood-rotting, white rot, widespread (North America and Europe), see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Vlasák et al. 2010 (new combination, phylogeny, Central Europe), Garcia-Sandoval et al. 2011 (phylogeny).

Donkioporiella L.W. Zhou 2016, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *D. mellea* L.W. Zhou, wood-rotting,

China, sequence data available, see Qin et al. 2016 (taxonomy, China).

Drepanoconis J. Schröt. & Henn. 1896, Cryptobasidiaceae, Exobasidiales, Exobasidiomycetes, three species, type species *D. brasiliensis* J. Schröt. & Henn., species plant parasitic (leaves, fruits) on Lauraceae, Central and South America, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2002, 2014, Wang et al. 2015c (taxonomy, phylogeny).

Ductifera Lloyd 1917, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, c. eleven species, type species *D. millei* Lloyd, widespread, sequence data available, see Weiß and Oberwinkler 2001 (phylogeny, Auriculariales).

Duportella Pat. 1915, Peniophoraceae, Russulales, Agaricomycetes, asexual morph unknown, 13 species, type species *D. velutina* Pat., worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted), Spirin and Kout 2015 (new spp. North East Asia, morphology).

Durianella Desjardin, A.W. Wilson & Manfr. Binder 2008, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *D. echinulata* (Corner & Hawker) Desjardin, A.W. Wilson & Manfr. Binder, gastroid, known only from Malaysia, sequence data available, see Desjardin et al. 2008b (taxonomy, phylogeny).

Earliella Murrill 1905, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *E. scabrosa* (Pers.) Gilb. & Ryvarden, basidioma effused-reflexed to resupinate, poroid hymenophore, wood-rotting, white rot, widespread (tropical), see Kirk et al. 2013 (genus accepted), medicinal use, see Zmitrovich 2018b (mini-review), sequence data available, see Justo and Hibbett 2011 (phylogeny).

Eballistra R. Bauer, Begerow, A. Nagler & Oberw. 2001, Eballistraceae, Georgefischeriales, Exobasidiomycetes, four species, type species *E. oryzae* (Syd. & P. Syd.) R. Bauer, Begerow, A. Nagler & Oberw., plant parasites (leaves, stems) on Poaceae, widespread in Southern Hemisphere, cultures unavailable, sequence data available, see Bauer et al. 2001b, Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Echinochaete D.A. Reid 1963, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *E. megalopora* (Bres.) D.A. Reid [current name: *E. brachypora* (Mont.) Ryvarden], basidioma laterally stipitate, with short stipite, hymenophore poroid, element setoids with lateral spines, wood-rotting, white rot, widespread (tropical), see Kirk et al. 2013 (genus accepted), sequence data available, see Sotome et al. 2009 (new sp., phylogeny, Asia, Japan).

Echinoderma (Locq. ex Bon) Bon 1991, Agaricaceae, Agaricales, Agaricomycetes, asexual morph not known, c. 15 species, type species *E. asperum* (Pers.) Bon, worldwide, sequence data available, see Vu et al. 2019 (DNA barcodes), in need of revision.

Echinodontiellum S.H. He & Nakasone 2017, Echinodontiaceae, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *E. japonicum* (Imazeki) S.H. He & Nakasone, wood-rotting, causing a white rot on living *Quercus* in Japan and China, sequence data available, see Liu et al. 2017e (taxonomy).

Echinodontium Ellis & Everh. 1900, Echinodontiaceae, Russulales, Agaricomycetes, asexual morph unknown, four species, type species *E. tinctorium* (Ellis & Everh.) Ellis & Everh., America, Japan, Europe, basidioma ungulate to effuse-refflexed, hymenophore dentate to daedaleoid or poroid, white rot, see Kirk et al. 2013 (genus accepted), sequence data available, see Liu et al. 2017e (phylogeny).

Echinophallus Henn. 1898, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *E. lauterbachii* (Henn.) Henn., terrestrial, East Indies, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Echinoporia Ryvarden 1980, Schizoporaceae, Hymenochaetales, Agaricomycetes, anamorph *Echinodia*, three species, type species *E. hydnophora* (Berk. & Broome) Ryvarden, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data unavailable, see Motato-Vasquez et al. 2015 (new records, geographic distribution), new spp. see Coelho 2008 (Brazil).

Edythea H.S. Jacks. 1931, *incertae sedis*, Pucciniales, Pucciniomycetes, five species, type species *E. quitensis* (Lagerh.) H.S. Jacks. & Holw., biotrophic on Arecaceae, Berberidaceae, terrestrial, South America, see Kirk et al. 2013 (genus accepted), sequence data available, see Ordoñez and Barnes 2017 (*E. quitensis*, Ecuador).

Effuseotrichosporon A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Trichosporonaceae, Trichosporonales, Tremellomycetes, sexual morph unknown, one species, type species *E. vanderwaltii* (Motaung, Albertyn, Kock, C.F. Lee, S.O. Suh, M. Blackw. & C.H. Pohl) A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, soil, South Africa, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Efibula Sheng H. Wu 1990, Irpicaceae, Polyporales, Agaricomycetes, asexual morph unknown, 18 species, type species *E. tropica* Sheng H. Wu, resupinate corticioid basidioma, wood-rotting, white rot, widespread, sequence data available, see Floudas and Hibbett 2015 (new spp., phylogeny, *Phanerochaete s. l*, USA).

Efibulella Zmitr. 2018, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *E. deflectens* (P. Karst.) Zmitr., grandinioid basidioma, wood-rotting, white rot, see Zmitrovich 2018a (taxonomy).

Efibulobasidium K. Wells 1975, Sebacinaceae, Sebacinales, Agaricomycetes, asexual morph known, one species, type species *E. albescens* (Sacc. & Malbr.) K. Wells, worldwide, saprobic, sequence data available, see Oberwinkler et al. 2014 (taxonomy, phylogeny, Sebacinales), Kirschner et al. 2017 (*Chaetospermum camelliae* with *Efibulobasidium* teleomorph from Panama).

Eichleriella Bres. 1903, Auriculariaceae, Auriculariales, Agaricomycetes, asexual morph unknown, c. 14 species, type species *E. incarnata* Bres., widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Malysheva and Spirin 2017 (phylogeny, new spp.).

Elaphocephala Pouzar 1983, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, one species, type species *E. iocularis* Pouzar, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Elaphroporia Z.Q. Wu & C.L. Zhao 2018, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *E. ailaoshanensis* Z.Q. Wu & C.L. Zhao, China, sequence data unavailable, see Wu et al. 2018d (genus accepted, China).

Elateraecium Thirum., F. Kern & B.V. Patil 1966 (= *Hiratsukamyces* Thirum., F. Kern & B.V. Patil 1975 *fide* Art. 59.1), *incertae sedis*, Pucciniales, Pucciniomycetes, sexual morph previously known in *Hiratsukamyces* Thirum., F. Kern & B.V. Patil 1975, three species, type species *E. salaciicola* Thirum., F. Kern & B.V. Patil, India, south Africa, sequence data unavailable, see Kirk et al. 2008.

Ellula Nag Raj 1980, *incertae sedis*, *incertae sedis*, Agaricomycetes, one species, type species *E. guaduae* (Viégas) Nag Raj, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Elmerina Bres. 1912, Auriculariaceae, Auriculariales, Agaricomycetes, asexual morph unknown, seven species, type species *E. cladophora* (Berk.) Bres., widespread (esp. tropical), see Kirk et al. 2013 (genus accepted), sequence data available, see Brazee et al. 2012b (phylogeny, ecology), Sotome et al. 2014 (Asian species, poroid Auriculariales, phylogeny), new spp. see Zhou and Dai 2013b (China, phylogeny), Wu et al. 2015a (central China).

Emmia Zmitr., Spirin & Malysheva 2006, Irpicaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *E. latemarginata* (Durieu & Mont.) Zmitr., Spirin & Malysheva, poroid hymenophore, wood-rotting, white rot (*E. latemarginata* (Durieu & Mont.) Zmitr., Spirin & Malysheva), see El-Gharabawy et al. 2016 (wood decay, Polyporales), widespread, sequence data available, see Zmitrovich and Malysheva 2014 (phylogeny), Miettinen et al. 2016b (phylogeny, Phanerochaetaceae), Wu et al. 2017a (new combination, China), Zmitrovich 2018a (taxonomy).

Endoclathrus B. Liu, Yin H. Liu & Z.J. Gu 2000, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *E. panzhihuaensis* B. Liu, Yin H. Liu & Z.J. Gu, terrestrial, China, sequence data unavailable.

Endocronartium Y. Hirats. 1969, Cronartiaceae, Pucciniales, Pucciniomycetes, two species, type species *E. harknessii* (J.P. Moore) Y. Hirats., biotrophic on Pinaceae (*Pinus*), terrestrial, North America, Japan, see Kirk et al. 2013 (genus accepted), sequence data available, see Jitjak and Sanoamuang 2017 (phylogeny).

Endogonopsis R. Heim 1966, Diplocystidiaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *E. sacramentarium* R. Heim, Asia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Endolepiotula Singer 1963, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *E. ruizlealii* Singer, Argentina, basidioma gasteroid, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Endopandanicola Tibpromma & K.D. Hyde 2018, Polyporaceae, Polyporales, Agaricomycetes, asexual morph known, one species, type species *E. thailandica* Tibpromma & K.D. Hyde, Thailand, sequence data available, see Tibpromma et al. 2018 (taxonomy).

Endoperplexa P. Roberts 1993, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, six species, type species *E. dartmorica* P. Roberts, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Roberts 2008a, b (British Virgin Islands, Belize).

Endophallus M. Zang & R.H. Petersen 1989, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *E. yunnanensis* M. Zang & R.H. Petersen, terrestrial, China, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Endophyllum Lév. 1826 [1825], Pucciniaceae, Pucciniales, Pucciniomycetes, 43 species, type species *E. persoonii* Lév, biotrophic on various families including Asteraceae, Convolvulaceae, Crassulaceae, Euphorbiceae, Malvaceae, terrestrial, circumglobal especially in tropics, see Kirk et al. 2013 (genus accepted), sequence data available, see Crous 2005 (South Africa), new spp. see Berndt and Wood 2012 (new combination).

Endoraecium Hodges & D.E. Gardner 1984, Raveneliaceae, Pucciniales, Pucciniomycetes, 22 species, type species *E. acaciae* Hodges & D.E. Gardner, biotrophic on *Acacia* (Fabaceae), terrestrial, Australia, South-East Asia (China), Hawaii, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Berndt 2011 (new combination), McTaggart et al. 2015 (key to Australian species, molecular phylogeny).

Entocybe T.J. Baroni, V. Hofst. & Largent 2011, Entolomataceae, Agaricales, Agaricomycetes, asexual morph unknown, ten species, type species *E. trachyospora* (Largent) Largent, T.J. Baroni & V. Hofstetter, worldwide,

sequence data available, see Baroni et al. 2011 (phylogeny), new spp. see Baroni and Lamoureux 2013 (Canada), Bergemann et al. 2013 (new combination).

Entoloma Fr. ex P. Kumm. 1871, Entolomataceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 1800 species, type species *E. sinuatum* (Bull.) P. Kumm., worldwide, mostly saprotrophic, minority of species mycorrhizal or weakly parasitic see Tedersoo et al. 2010, some species edible (*E. lividoalbum* (Kühner & Romagn.) Kubička), see Kirk et al. 2013 (genus accepted), Horak 2008 (New Zealand, monograph), Noordeloos 2008 (North America, type studies, morphology), Noordeloos and Gates 2012a (Tasmania, Australia, morphology, monograph), Maity et al. 2014, 2015 (compounds), Dovana et al. 2016 (*E. ochreoprunuloides*, Italy), Mešić et al. 2016 (new names, new combinations), sequence data available, see Co-David et al. 2009 (phylogeny), Baroni and Matheny 2011 (phylogeny), Baroni et al. 2011 (phylogeny), Kinoshita et al. 2012 (sequestrate species, phylogeny), He et al. 2013a, 2013b (China, phylogeny, type study), Morgado et al. 2013 (phylogeny), Vila et al. 2013 (phylogeny, morphology), Morozova et al. 2014a (phylogeny), Kokkonen 2015 (phylogeny), Kondo et al. 2017 (*E. rhodopolium*-related species, Japan, PCR-RFLP), new spp. see Largent et al. 2008 (Guyana, South America), Noordeloos and Polemis 2008 (Greece), Contu et al. 2009 (Italy), Eyssartier and Noordeloos 2009 (France), Gates et al. 2009 (Tasmania), Horak and Cheype 2009 (French Guiana, South America), Li and Li 2009 (China), Li et al. 2009a (China), Noordeloos and Hausknecht 2009 (Austria), Vila and Caballero 2009 (Spain), Aime et al. 2010 (Australia, as *Calliderma, Paraeccilia* and *Trichopilus*), Blanco-Dios 2010 (Spain), Eyssartier et al. 2010 (New Caledonia), Henkel et al. 2010b (Guyana, South America, as *Albolepotonia*), Jordal and Noordeloos 2010 (Norway), Noordeloos and Morozova 2010 (Russia), Noordeloos et al. 2010, 2017 (Netherlands, Norway), Van Waveren and Llistosella 2010 (Spain), Eyssartier et al. 2011b (New Caledonia), He et al. 2011b (China), Largent et al. 2011a, b, 2013a, b, 2015, 2016 (Australia, as *Claudopus*, as *Pouzarella,* as *Leptonia*, as *Inocephalus*), Senthilarasu et al. 2010a (India), Takahashi 2011 (Japan, as *Clitopilus*), Wölfel and Hampe 2011 (Germany), Blanco-Dios 2012 (Spain), Caballero et al. 2012 (Spain), He et al. 2012 (China), Morozova et al. 2012 (Vietnam), Pradeep et al. 2012b (India), Raj and Manimohan 2012, 2017 (India), Wölfel et al. 2012 (Germany), Blanco-Dios 2013a (Spain), Coimbra et al. 2013a (Brazil), Illice and Todeschini 2013 (Italy), Qi et al. 2013 (China), Ribes and Vila 2013 (Spain), Vila et al. 2013 (Spain), Wang and Bau 2013 (China), Battistin et al. 2014 (China), Eyssartier and Buyck 2014 (Madagascar), Henkel et al. 2014a (Guyana, South America, as *Nolanea*), Morozova et al. 2014a (Russia), Raj et al. 2014b (India), Weholt et al. 2014 (Norway), Ariyawansa et al. 2015 (Italy), Catcheside et al. 2015 (Australia), Crous et al. 2015a, 2016b, 2017b, 2018a (Vietnam, China, Russia, Ecuador), Deng et al. 2015b (China), He et al. 2015a, b, c (China), Karstedt and Capelari 2015 (Brazil), Raj and Manimohan 2016 (India), Blanco-Dios 2016 (Spain), Largent and Bergemann 2016 (USA, as *Pouzarella*), Lüderitz et al. 2016 (Germany), Montañez et al. 2016 (Mexico), Noordeloos and Hausknecht 2016 (Seychelles, La Réunion, Mauritius), Pradeep et al. 2016a (India), Vidal et al. 2016 (Spain), Blanco-Dios 2017 (Spain, new names and combinations), Ediriweera et al. 2017 (China), He et al. 2017c (China), Karstedt and Capelari 2017 (Brazil), Tibpromma et al. 2017 (India), Ainsworth et al. 2018 (UK), Morozova et al. 2018 (Russia, Vietnam).

Entomocorticium H.S. Whitney, Bandoni & Oberw. 1987, Peniophoraceae, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *E. dendroctoni* H.S. Whitney, Canada, see Kirk et al. 2013 (genus accepted), sequence data available, see Sakayaroj et al. 2010 (phylogeny, Thailand).

Entyloma de Bary 1874, Entylomataceae, Entylomatales, Exobasidiomycetes, asexual morph unknown, 163 species, type species *E. microsporum* J. Schröt., plant parasites on dicots, widespread, saprobic yeast states, see Kirk et al. 2013 (genus accepted), cultures available, sequence data available, see Begerow et al. 2002, Begerow et al. 2014, Boekhout et al. 2006, Wang et al. 2015c (phylogeny).

Entylomaster Vánky & R.G. Shivas 2006, Doassansiaceae, Doassansiales, Exobasidiomycetes, two species, type species *E. typhonii* Vánky & R.G. Shivas, plant parasites on Araceae, Europe, Australia, cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Eocronartium G.F. Atk. 1902, Eocronartiaceae, Platygloeales, Pucciniomycetes, one species, type species *E. typhuloides* G.F. Atk. [current name: *E. muscicola* (Pers.) Fitzp.], biotrophic on *Musci*, Europe, North America, see Kirk et al. 2013 (genus accepted), sequence data available, cultures available, see Henk and Vilgalys 2007 (insect symbiosis origin, phylogeny).

Eonema Redhead, Lücking & Lawrey 2009, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *E. pyriforme* (M.P. Christ.) Redhead, Lücking & Lawrey, sequence data available, see Lawrey et al. 2009 (phylogeny, taxonomy).

Epicnaphus Singer 1960, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *E. phalaropus* Singer, saprophytic, South America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Episphaeria Donk 1962, Crepidotaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *E. fraxinicola* (Berk. & Broome) Donk,

Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Epithele (Pat.) Pat. 1900, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, 17 species, type species *E. typhae* (Pers.) Pat., resupinate basidioma, odontioid hymenophore (formed by sterile hyphal pegs), wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Justo et al. 2017 (phylogeny, Polyporales), Zmitrovich 2018a (taxonomy), new spp. see Wang et al. 2010a (morphology, China, Vietnam), Nakasone 2013 (new combination, morphology, Belize, Reunion, Trinidad and Tobago, Venezuela).

Epithelopsis Jülich 1976, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *E. fulva* (G. Cunn.) Jülich, resupinate basidioma, odontioid hymenophore (formed by sterile hyphal pegs), wood-rotting, widespread (Australia, India, New Zealand), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Erastia Niemelä & Kinnunen 2005, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *E. salmonicolor* (Berk. & M.A. Curtis) Niemelä & Kinnunen, poroid hymenophore, wood-rotting, widespread (Asia, Europe, USA and Cuba), sequence data unavailable, see Kirk et al. 2008, Zmitrovich 2018a (taxonomy).

Eriocaulago Vánky 2005, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, two species, type species *E. eriocauli* (Massee) Vánky, species parasite (ovaries) on plant Eriocaulaceae, Angola, India, Madagascar, Thailand, USA, cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Eriocortex Vánky & R.G. Shivas 2013, *incertae sedis*, *incertae sedis*, Ustilaginomycetes, aexual morph unknown, one species, type species *E. eriocauli* R.G. Shivas, Vánky, M.D. Barrett & M. Lutz, Australia, plant parasites (ovaries) on Eriocaulaceae, Australia, cultures unavailable, sequence data available, see Vánky et al. 2013, Nasr et al. 2014a (taxonomy).

Eriocybe Vellinga 2011, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *E. chionea* Vellinga, agaricoid, saprotrophic, Thailand, sequence data available, see Vellinga et al. 2011 (genus introduced).

Eriomoeszia Vánky 2005, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, one species, type species *E. eriocauli* (G.P. Clinton) Vánky, plant parasite (ovaries) on *Eriocaulon* spp. (Eriocaulaceae), India, USA, cultures unavailable, sequence data available, see Begerow et al. 2014, Nasr et al. 2014a (taxonomy).

Eriosporium Vánky 2005, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, two species, plant parasites (ovaries) on Eriocaulaceae, Angola, cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Erratomyces M. Piepenbr. & R. Bauer 1997, Erratomycetaceae, Tilletiales, Exobasidiomycetes, five species, type species *E. patelii* (Pavgi & Thirum.) M. Piepenbr. & R. Bauer, plant parasites (leaves) on Fabaceae, Africa, South America, North America, India, see Kirk et al. 2013 (genus accepted), cultures available, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (phylogeny).

Ertzia B.P. Hodk. & Lücking 2014, Lepidostromataceae, Lepidostromatales, Agaricomycetes, asexual morph unknown, one species, type species *E. akagerae* (Eb. Fisch., Ertz, Killmann & Sérus.) B.P. Hodk. & Lücking, tropical Africa, lichenized, sequence data available, see Hodkinson et al. 2014 (monograph), Liu et al. 2017a (phylogeny).

Erythricium J. Erikss. & Hjortstam 1970 (= *Marchandiobasidium* Diederich & Schultheis 2003), Corticiaceae, Corticiales, Agaricomycetes, asexual morph known (bulbils, *Marchandiobasidium* Diederich & Schultheis *fide* Hawksworth and Henrici 2015), six species, type species *E. laetum* (P. Karst.) J. Erikss. & Hjortstam, wood-rotting and lichenicolous, widespread, see Diederich et al. 2003 (taxonomy of asexual morph), Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Ghobad-Nejhad and Hallenberg 2011 (Iran), Hawksworth and Henrici 2015 (new combination).

Erythrobasidium Hamam., Sugiy. & Komag. 1988, Erythrobasidiaceae, Erythrobasidiales, Cystobasidiomycetes, sexual and asexual morphs known, three species, *E. hasegawianum* Hamam., Sugiy. & Komag., yeast, plant material, worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Wang et al. 2015d, e (taxonomy, phylogeny).

Erythromyces Hjortstam & Ryvarden 1990, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *E. crocicreas* (Berk. & Broome) Hjortstam & Ryvarden, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Yuan and Wan 2012 (phylogeny).

Erythrophylloporus Ming Zhang & T.H. Li 2018, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *E. cinnabarinus* Ming Zhang & T.H. Li, China, terrestrial, stipitate-pileate, presumably ectomycorrhizal, sequence data available, see Zhang and Li 2018 (taxonomy, phylogeny).

Esalque J.F. Hennen, Figueiredo & A.A. Carvalho 2000, Raveneliaceae, Pucciniales, Pucciniomycetes, one species, type species *E. holwayi* (H.S. Jacks.) J.F. Hennen, Figueiredo & A.A. Carvalho, biotrophic on *Caesalpinia* (Fabaceae), terrestrial, Brazil, sequence data unavailable, see Kirk et al. 2008.

Exidia Fr. 1822, Auriculariaceae, Auriculariales, Agaricomycetes, asexual morph unknown, c. 26 species, type species *E. glandulosa* (Bull.) Fr., widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Sotome et al. 2014 (Asian species, poroid Auriculariales, phylogeny), new spp. see Roberts 2009 (British Isles).

Exidiopsis (Bref.) Möller 1895, Auriculariaceae, Auriculariales, Agaricomycetes, asexual morph unknown, c. 30 species, type species *E. effusa* Bref., widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Sotome et al. 2014 (Asian species, poroid Auriculariales, phylogeny), Malysheva and Spirin 2017 (phylogeny).

Exobasidium Woronin 1867, Exobasidiaceae, Exobasidiales, Exobasidiomycetes, type species *E. vaccinii* (Fuckel) Woronin, 51 species, plant parasites (leaves, stems) on Ericales, widespread in Europe, South America, East Asia, see Kirk et al. 2013 (genus accepted), cultures available, sequence data available, see Begerow et al. 2002, 2014, Wang et al. 2015c (phylogeny).

Exoteliospora R. Bauer, Oberw. & Vánky 1999, Melanotaeniaceae, Ustilaginales, Ustilaginomycetes, one species, type species *E. osmundae* (Peck) R. Bauer, Oberw. & Vánky, plant parasite (leaves) on *Osmunda* (Osmundaceae), North America, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Faerberia Pouzar 1981, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *F. carbonaria* (Alb. & Schwein.) Pouzar, cantharelloid basidioma, terrestrial (post-fire), Europe, North America, see Kirk et al. 2013 (genus accepted), sequence data available, see Thorn et al. 2000 (phylogeny, Pleurotaceae).

Farysia Racib. 1909, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, (= *Elateromyces* Bubák, Arch. Prírodov. Výzk. 1912; = *Farysizyma* A. Fonseca 2008), 23 species, type species *F. javanica* Racib., plant parasites (flowers) on genera *Carex* and *Uncinia* (Cyperaceae), Africa, East Asia, South Asia, Australia, saprobic yeast states on plants, see Kirk et al. 2013 (genus accepted), cultures available, sequence data available, see Inácio et al. 2008, Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Farysporium Vánky 1999, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, asexual morph unknown, one species, type species *F. endotrichum* (Berk.) Vánky, plant parasite (flowers) on *Gahnia* spp. (Cyperaceae), Australasia, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Favillea Fr. 1849, Sclerodermataceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *F. argillacea* Fr., Australia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Favolaschia (Pat.) Pat. 1892, Mycenaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 54 species, type species *F. gaillardii* (Pat.) Pat., tropics and subtropics, see Vizzini et al. 2009 (species distribution), Kirk et al. 2013 (genus accepted), Chepkirui et al. 2016 (compounds), sequence data available, see Gillen et al. 2013 (Ecuador, Panama, key), Capelari et al. 2014 (Brazil, phylogeny), new spp. see Takahashi 2011 (Japan), Magnago et al. 2013a (Brazil), Pérez-Ramírez et al. 2014 (Mexico).

Favolus P. Beauv. 1805, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 20 species, type species *F. daedaleus* (Link) Fr. [current name: *F. brasiliensis* (Fr.) Fr.], poroid hymenophore, wood-rotting, white rot, widespread (mainly in tropics), see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), some species edible (*F. brasiliensis*), see Sanuma et al. 2016 (edible mushrooms, Brazil), sequence data available, see Sotome et al. 2013 (phylogeny, emendation of genus, key), Dai et al. 2014b (phylogeny, China), Zhou et al. 2016b (phylogeny, China), Papp and Dima 2017 (phylogeny, Central Europe), new spp. see Tibpromma et al. 2017 (phylogeny, Korea), Zhou and Cui 2017 (phylogeny, China).

Fayodia Kühner 1930, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. ten species, type species *F. bisphaerigera* (J.E. Lange) Singer, North temperate, see Kirk et al. 2013 (genus accepted), Antonín 2004 (type studies), Antonín and Noordeloos 2004 (European taxa), sequence data available, see Moncalvo et al. 2002 (phylogeny), Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure).

Fellomyces Y. Yamada & Banno 1984, Cuniculitremaceae, Tremellales, Tremellomycetes, sexual morph unknown, four species, type species *F. polyborus* (D.B. Scott & Van der Walt) Y. Yamada & I. Banno, yeast, widespread, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (taxonomy, phylogeny).

Fellozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, Chrysozymaceae, *incertae sedis*, Microbotryomycetes, sexual morph unknown, one species, type species *F. inositophila* (Nakase & M. Suzuki) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, plant material, Japan, cultures and sequence data available, see Wang et al. 2015e (taxonomy, phylogeny).

Femsjonia Fr. 1849, Dacrymycetaceae, Dacrymycetales, Dacrymycetes, asexual morph unknown, seven species, type species *F. luteoalba* Fr. [current name: *Ditiola peziziformis* (Lév.) D.A. Reid], wood-rotting, sequence data available, new spp. see Shirouzu et al. 2017 (Japan), Tibpromma et al. 2017 (China).

Fereydounia S. Nasr, M.R. Soudi, H.D.T. Nguyen, M. Lutz & Piątek 2014, Fereydouniaceae, Urocystidales, Ustilaginomycetes, one species, known only from saprobic states, plant material, cultures available, sequence data available, see Nasr et al. 2014a (description), Wang et al. 2015c (taxonomy, phylogeny).

Fevansia Trappe & Castellano 2000, Rhizopogonaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *F. aurantiaca* Trappe & Castellano, ectomycorrhizal, North America, sequence data available.

Fibricium J. Erikss. 1958, *incertae sedis*, Hymenochaetales, Agaricomycetes, asexual morph unknown, five species, type species *F. greschikii* (Bres.) J. Erikss., wood-rotting, see Kirk et al. 2013 (genus accepted), sequence data available, see Wu et al. 2007 (phylogeny).

Fibrodontia Parmasto 1968, Schizoporaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, six species, type species *F. gossypina* Parmasto, wood-rotting, sequence data available, new sp. and new comb. see Yurchenko and Wu 2014c (China), Baltazar et al. 2016 (taxonomy).

Fibroporia Parmasto 1968, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, c. ten species, type species *F. vaillantii* (DC.) Parmasto, basidioma resupinate, hymenophore poroid, wood-rotting, brown rot, widespread, sequence data available, see Chen et al. 2017d (new spp., phylogeny, China), new spp. see Bernicchia et al. 2012 (new combination, phylogeny, *Antrodia s. l*, Czech Republic), Chen et al. 2015e (phylogeny, China).

Fibulobasidium Bandoni 1979, Sirobasidiaceae, Tremellales, Tremellomycetes, sexual and asexual morphs known, three species, type species *F. inconspicuum* Bandoni, yeast, insect, worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Fibulochlamys A.I. Romero & Cabral 1989, *incertae sedis*, Agaricales, Agaricomycetes, two species, type species *F. ferruginosa* A.I. Romero & Cabral, Argentina, Chile, see Kirk et al. 2013 (genus accepted), sequence data available, see Madrid et al. 2010 (new sp.).

Fibulocoela Nag Raj 1978, *incertae sedis*, *incertae sedis*, Agaricomycetes, one species, type species *F. indica* Nag Raj, India, Cuba, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Fibulosebacea K. Wells & Raitv. 1987, Auriculariaceae, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *F. strigosa* (Bourdot & Galzin) K. Wells & Raitv., Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Fibulotaeniella Marvanová & Bärl. 1988, *incertae sedis*, *incertae sedis*, Agaricomycetes, hyphomycetous, one species, type species *F. canadensis* Marvanová & Bärl., Canada, sequence data unavailable, see Kirk et al. 2008.

Filobasidium L.S. Olive 1968, Filobasidiaceae, Filobasidiales, Tremellomycetes, sexual and asexual morphs known, nine species, type species *F. floriforme* L.S. Olive, yeast, worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (emendation, taxonomy and phylogeny).

Fissolimbus E. Horak 1979, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *F. fallaciosus* E. Horak, Papua New Guinea, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Fistulina Bull. 1791, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph *Confistulina* Stalpers, nine species, type species *F. hepatica* (Schaeff.) With., worldwide, basidioma pileate-stipitate, hymenophore tubular, with separate tubes, wood decaying, brown rot, beefsteak fungus, some species edible (*F. hepatica* (Schaeff.) With.), see Hall et al. 2003 (edible mushrooms), Dai et al. 2010b (Chinese edible mushrooms), Kirk et al. 2013 (genus accepted), sequence data available, see Bodensteiner et al. 2004 (phylogeny, cyphelloid homobasidiomycetes), Matheny et al. 2006 (phylogeny), Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Floudas et al. 2015 (genome), new spp, see Song et al. 2015 (China).

Fistulinella Henn. 1901, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 25 species, type species *F. staudtii* Henn., stipitate-pileate, presumably ectomycorrhizal, pantropical and South temperate zone of Australia, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Fulgenzi et al. 2010 (Guyana), Magnago et al. 2017a (Brazil), new combinations see Horak et al. 2011, genus in need of revision.

Flabellimycena Redhead 1984, Mycenaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *F. flava* (Singer) Redhead, South America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Flabellophora G. Cunn. 1965, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, 18 species, type species *F. superposita* (Berk.) G. Cunn., poroid hymenophore, wood-rotting, widespread (pantropical), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Flagelloscypha Donk 1951, Niaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 25 species, type species *F. minutissima* (Burt) Donk, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Bodensteiner et al. 2004 (phylogeny, cyphelloid homobasidiomycetes).

Flamingomyces R. Bauer, M. Lutz, Piątek, Vánky & Oberw. 2007, Urocystidaceae, Urocystidales, Ustilaginomycetes, one species, type species *F. ruppiae* (Feldmann)

R. Bauer, M. Lutz, Piątek, Vánky & Oberw., plant parasite (leaves, rhizome) on *Ruppia maritima* (Ruppiaceae), Europe, cultures unavailable, sequence data available, see Begerow et al. 2014 (taxonomy).

Flaminia Sacc. & P. Syd. 1902, *incertae sedis*, Pucciniales, Pucciniomycetes, one species, type species *F. amylospora* (Rehm) Sacc. & P. Syd., on *Xanthoxylon*, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Flammeopellis Y.C. Dai, B.K. Cui & C.L. Zhao 2014, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *F. bambusicola* Y.C. Dai, B.K. Cui & C.L. Zhao, China, poroid hymenophore, bambusicolous, white rot, sequence data available, see Zhao et al. 2014b (taxonomy, phylogeny, China).

Flammula (Fr.) P. Kumm. 1871, Hymenogastraceae, Agaricales, Agaricomycetes, asexual morph unknown, c. ten species, type species *F. flavida* (Fr.) P. Kumm., see Redhead 2013b (nomenclature), sequence data available, see Moncalvo et al. 2002 (phylogeny), Matheny et al. 2006 (phylogeny)

Flammulaster Earle 1909, Tubariaceae, Agaricales, Agaricomycetes, asexual morph unknown, 20 species, type species *F. carpophilus* (Fr.) Earle ex Vellinga, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Gulden et al. 2005 (phylogeny), Matheny 2005 (phylogeny), Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Matheny et al. 2015 (phylogeny, clustering into Tubariaceae), Horak 2018 (monograph, New Zealand).

Flammulina P. Karst. 1891, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, 14 species, type species *F. velutipes* (Curtis) Singer, worldwide, some species edible, enokitake (*F. velutipes* (Curtis) Singer), see Hall et al. 2003 (edible mushrooms), Smiderle et al. 2008 (nutritional values), Yang et al. 2012a (compounds), Kirk et al. 2013 (genus accepted), sequence data available, see Matheny and Bougher 2006 (phylogeny), new spp. see Ge et al. 2008b, 2015a (China, phylogeny).

Flavidoporia Audet 2017, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *F. pulvinascens* (Pilát) Audet, wood-rotting, see Audet 2017d (taxonomy), sequence data available, see Ortiz-Santana et al. 2013 (antrodia clade of Polyporales, phylogeny), Spirin et al. 2016b (phylogeny, *Antrodia s. s.*).

Flaviporus Murrill 1905, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, 14 species, type species *F. brownii* (Humb.) Donk, poroid hymenophore, wood-rotting, widespread (tropical), see Kirk et al. 2013 (genus accepted), sequence data available, see Miettinen et al. 2012 (phylogeny), see Wu et al. 2017a (new combination, phylogeny).

Flavodon Ryvarden 1973, Irpicaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *F. flavus* (Klotzsch) Ryvarden, varied hymenophore (poroid, hydnoid to irpicoid), wood-rotting, white rot, mycosymbiont of ambrosia beetles, see Kasson et al. 2016 (symbiosys, *F. ambrosius* D.R. Simmons, You Li, C.C. Bateman & J. Hulcr), sequence data available, see Miettinen et al. 2012 (phylogeny), see Simmons et al. 2016 (new sp., phylogeny, USA), Wu et al. 2017a (new combination, phylogeny).

Floccularia Pouzar 1957, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *F. luteovirens* (Alb. & Schwein.) Pouzar, worldwide, some species edible (*F. luteovirens* (Alb. & Schwein.) Pouzar), see Dai et al. 2010b (Chinese edible mushrooms), Li et al. 2010b (nutritional components), Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny).

Floromyces Vánky, M. Lutz & R. Bauer 2008, Floromycetaceae, Urocystidales, Ustilaginomycetes, one species, type species *F. anemarrhenae* (C.H. Chow & Chi C. Chang) Vánky, M. Lutz & R. Bauer, plant parasite (flowers) on *Anemarrhena asphodeloides* (Asparagaceae), China, cultures unavailable, sequence data available, see Begerow et al. 2014, Nasr et al. 2014a (taxonomy).

Fomes (Fr.) Fr. 1849, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *F. fomentarius* (L.) Fr., perennial basidioma, poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), medicinal use, see Grienke et al. 2014, Gáper et al. 2016 (review, *F. fomentarius*), ethnomycological use, see Papp et al. 2017a (Transylvania, Europe, *F. fomentarius*), sequence data available, see Judova et al. 2012 (phylogeny, Europe), McCormick et al. 2013 (phylogeny, culture study, USA).

Fomitella Murrill 1905, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *F. supina* (Sw.) Murrill, poroid hymenophore, wood-rotting, white rot, widespread (tropical, subtropical), sequence data available, see Justo et al. 2017 (phylogeny, Polyporales), see Hattori and Sotome 2013 (new combination, morphology, type study, Malaysia).

Fomitiporella Murrill 1907, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, 13 species, type species *Poria umbrinella* Bres., basidioma resupinate, hymenophore poroid, wood-decaying, white rot, widespread, sequence data available, new spp. see Zhou 2014c (genus accepted), Ji et al. 2017c, 2018 (species diversity, phylogeny, China).

Fomitiporia Murrill 1907, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, 46 species, type species *F. langloisii* Murrill, basidioma resupinate to pileate, hymenophore poroid, wood-rotting, white rot, widespread, *F. ellipsoidea* has the largest fruiting body among the fungi, see Dai and Cui 2011, possibly

medicinal use, see Liu et al. 2017b (antioxidant, HIV protease inhibiting and HIV integrase inhibiting activities), inclusion of some pathogenic wood-decaying species (*F. capensis* M. Fisch., M. Cloete, L. Mostert & F. Halleen, *F. hartigii* (Allesch. & Schnabl) Fiasson & Niemelä), see Kirk et al. 2013 (genus accepted), Cloete et al. 2014 (associated with esca on grapevine in South Africa), sequence data available, new spp. see Amalfi et al. 2010 (Africa), Vlasák and Kout 2011 (USA, new combinations, Pileate *Fomitiporia* species), Amalfi et al. 2012 (Southern USA and Northern Mexico), Raymundo et al. 2012 (México), Zhou and Xue 2012 (China), Amalfi and Decock 2013, 2014 (South America), Cloete et al. 2014 (South Africa), de Campos Santana 2014 (Brazil), Chen and Cui 2017 (China), Liu et al. 2018b (China).

Fomitopsis P. Karst. 1881, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 40 species, type species *F. pinicola* (Sw.) P. Karst., poroid hymenophore, wood-rotting, brown rot, widespread, see Kirk et al. 2013 (genus accepted), some species medicinal use, see Grienke et al. 2014, Pleszczyńska et al. 2017 (review, *F. betulina*, *F. pinicola*), sequence data available, see Han et al. 2016a (phylogeny, morphology), Floudas et al. 2012 (genome, *F. pinicola*), Hong et al. 2017 (genome, *F. palustris* (Berk. & M.A. Curtis) Gilb. & Ryvarden), new spp. Zhou and Wei 2012 (phylogeny, China), Li et al. 2013b (phylogeny, China), Han et al. 2014 (phylogeny, China), Tibpromma et al. 2017 (phylogeny, Brazil), new combination, see Hattori and Sotome 2013 (morphology, type study, Indonesia).

Fonsecazyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Bulleraceae, Tremellales, Tremellomycetes, sexual morph unknown, three species, type species *F. mujuensis* (K.S. Shin & Y.H. Park) X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, worldwide, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Foraminispora Robledo, Costa-Rezende & Drechsler-Santos 2017, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *F. rugosa* (Berk.) Costa-Rezende, Drechsler-Santos & Robledo, poroid hymenophore, terrestrial or wood-rotting, tropical (South America), sequence data available, see Costa-Rezende et al. 2017 (taxonomy, *Amauroderma* s. *l.*, new combination, phylogeny).

Fragifomes B.K. Cui, M.L. Han & Y.C. Dai 2016, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *F. niveomarginatus* (L.W. Zhou & Y.L. Wei) B.K. Cui, M.L. Han & Y.C. Dai, poroid hymenophore, wood-rotting, brown rot, China, sequence data available, see Zhou and Wei 2012 (*Fomitopsis niveomarginata*, phylogeny, China), Han et al. 2016a (new genus, new combination, phylogeny, morphology).

Fragiliporia Y.C. Dai, B.K. Cui & C.L. Zhao 2015, Fragiliporiaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *F. fragilis* Y.C. Dai, B.K. Cui & C.L. Zhao, resupinate basidioma, poroid hymenophore, wood-rotting, white rot, China, sequence data available, see Zhao et al. 2015a (new family, new genus, new sp., phylogeny, China).

Frantisekia Spirin & Zmitr. 2007, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, four species, type species *F. fissiliformis* (Pilát) Spirin & Zmitr., poroid hymenophore, wood-rotting, white rot, widespread (Northern Hemisphere), see Zmitrovich 2018a (taxonomy), sequence data available, see Miettinen et al. 2012 (phylogeny, *F. mentschulensis*), new sp. see Yuan 2014 (phylogeny, *Antrodiella*, China).

Franzpetrakia Thirum. & Pavgi 1957, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, three species, type species *F. microstegii* Thirum. & Pavgi, plant parasite (flowers) on Poaceae, East Asia, South Asia, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014 (taxonomy).

Fulvifomes Murrill 1914, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, 33 species, type species *F. robiniae* (Murrill) Murrill, basidioma pileate to ungulate, hymenophore poroid, wood-rotting, white rot, widespread, sequence data available, see Salvador-Montoya et al. 2018 (delimitation of *F. robiniae*, new sp.), new spp. see Baltazar and Gibertoni 2010 (new combinations), Dai 2010b (China), Zhou and Zhang 2012 (Cambodia), Zhou 2014b (China), Hattori et al. 2014 (Thailand), Zhou 2015b (Thailand), Ji et al. 2017b (America).

Fulvisporium Vánky 1997, Ustilentylomataceae, Microbotryales, Microbotryomycetes, asexual morph unknown, one species, type species *F. restifaciens* (D.E. Shaw) Vánky, on Poaceae, Australia, see Kirk et al. 2013 (genus accepted), sequence data available.

Funalia Pat. 1900, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. ten species, type species *F. mons-veneris* (Jungh.) Pat., poroid hymenophore, wood-rotting, white rot, widespread, industrial use, see Daâssi et al. 2014 (biodegradation, *F. gallica* (Fr.) Bondartsev & Singer), Zmitrovich et al. 2018c (*F. trogii* (Berk.) Bondartsev & Singer, mini-review), sequence data available, see, Li et al. 2016c (new sp., phylogeny, China), new combinations, see Dai and Yuan 2010 (type study, morphology, China), Zmitrovich and Malysheva 2013 (phylogeny, morphology).

Furtadoa Costa-Rezende, Robledo & Drechsler-Santos 2017, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *F. biseptata* Costa-Rezende, Drechsler-Santos & Reck, poroid hymenophore, terrestrial or wood-rotting, growing on the ground

or on decayed angiosperm wood, white rot, tropical (South America), sequence data available, see Costa-Rezende et al. 2017 (taxonomy, phylogeny).

Fuscoporia Murrill 1907, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, 62 species, type species *F. ferruginosa* (Schrad.) Murrill, basidioma resupinate to pileate, hymenophore poroid, wood-rotting, white rot, see Pires et al. 2015 (Brazilian Atlantic Rainforest), sequence data available, see Baltazar and Gibertoni 2010 (new combination), Raymundo et al. 2012, 2013a, b (morphology, new species, new combinations taxonomy, Sonoran desert, Mexico).

Fuscopostia B.K. Cui, L.L. Shen & Y.C. Dai 2019, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, four species, type species *F. fragilis* (Fr.) B.K. Cui, L.L. Shen & Y.C. Dai, worldwide, wood-rotting, sequence data available, see Shen et al. 2019 (taxonomy, phylogeny).

Galerella Earle 1909, Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, eight species, type species *G. plicatella* (Peck) Singer, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Tóth et al. 2013 (phylogeny), new spp. see Tkalčec et al. 2011 (tropical Africa, morphology), Bandala and Montoya 2015 (Mexico, morphology).

Galerina Earle 1909, Hymenogastraceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 250 species, type species *G. vittiformis* (Fr.) Singer, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Osmundson et al. 2013 (DNA barcode), Jang et al. 2015b (phylogeny), Riley et al. 2014 (genome), new spp. see Latha et al. 2015a (India).

Galeropsis Velen. 1930, Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, nine species, type species *G. desertorum* Velen. & Dvořák, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Tóth et al. 2013 (phylogeny, Bolbitiaceae).

Gallacea Lloyd 1905, Gallaceaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, six species, type species *G. scleroderma* (Cooke) Lloyd, Australia, New Zealand, see Kirk et al. 2013 (genus accepted), sequence data available, see Giachini et al. 2010 (phylogeny).

Gallowaya Arthur 1906, Coleosporiaceae, Pucciniales, Pucciniomycetes, three species, type species *G. pini* Arthur (current name: *G. pinicola* Arthur), pycniospores and teliospores microcyclic, North America, Siberia, *G. crowellii* on *Pinus*, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Galzinia Bourdot 1922, Corticiaceae, Corticiales, Agaricomycetes, asexual morph unknown, nine species, type species *G. pedicellata* Bourdot, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data from type not available, but from *G. incrustans* available, see Hibbett and Binder 2002 (evolution), Sjökvist et al. 2012 (evolution).

Gambleola Massee 1898, Pucciniosiraceae, Pucciniales, Pucciniomycetes, sexual morph unknown, one species, type species *G. cornuta* Massee, on *Berberis*, India, Nepal, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Gamundia Raithelh. 1979, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. seven species, type species *G. pseudoclusilis* (Joss. & Konrad) Raithelh., Europe, South America, see Antonín and Noordeloos 2004 (European taxa), Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Musumeci et al. 2010 (new sp., France).

Ganoderma P. Karst. 1881, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 180 species, type species *G. lucidum* (Curtis) P. Karst., basidioma pileate, poroid hymenophore, wood-rotting, white rot, see Kirk et al. 2013 (genus accepted), some species pathogen of horticultural plants or pulpwood plantations, see Wasser et al. 2006 (*G. lucidum*-complex), Mercière et al. 2015 (oil palm, basal stem rot disease, *G. boninense* Pat.), Page et al. 2018 (fungal mating systems, *G. philippii*, *G. mastoporum* and *G. australe*, Indonesia), Papp 2019 (review, taxonomy, global diversity), cosmopolitan, several species medicinal use, see Baby et al. 2015 (review, metabolites, biological activities), Lindequist et al. 2015 (review, *G. pfeifferi*, Europe), Richter et al. 2015 (review, chemotaxonomy), Hapuarachchi et al. 2017 (review, medicinal properties, clinical evidence), Papp et al. 2017b (review, *G. lucidum* complex, nomenclature, phylogeny), sequence data available, see Chen et al. 2012b (genome, *G. lingzhi* Sheng H. Wu, Y. Cao & Y.C. Dai, as *G. lucidum*, see Papp et al. 2017b), Zhou et al. 2015 (phylogeny, *G. lucidum* complex, northern hemisphere), Kües et al. 2015 (review, genomics, *Ganoderma* spp.), Jargalmaa et al. 2017 (Korean *Ganoderma* and database sequence validation), new spp. see Torres-Torres et al. 2008 (morphology, Mexico), Douanla-Meli and Langer 2009c (phylogeny, Cameroon), Welti and Courtecuisse 2010 (morphology, Martinique), Kinge and Mih 2011 (phylogeny, Cameroon), Cao et al. 2012 (phylogeny, China), Cao and Yuan 2013 (phylogeny, China), Crous et al. 2014b, 2015b, 2016a, 2017a, b (phylogeny, South Africa, Ecuador, Ghana, India), Coetzee et al. 2015 (phylogeny, South Africa), Li et al. 2015c (phylogeny, China), Xing et al. 2016, 2018 (phylogeny, South Africa, China), Hapuarachchi et al. 2018a, b, 2019 (phylogeny, China, Laos), Tchoumi et al. 2018 (phylogeny, South Africa), new combination, see Papp 2016 (nomenclature, East Asia).

Gasterella Zeller & L.B. Walker 1935, Gasterellaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *G. luteophila* Zeller & L.B. Walker,

USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Gasterellopsis Routien 1940, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *G. silvicola* Routien, USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Gasteroagaricoides D.A. Reid 1986, Psathyrellaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *G. ralstoniae* D.A. Reid, Australia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Gastroboletus Lohwag 1926, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, 14 species, type species *G. boedijnii* Lohwag, sequestrate, ectomycorrhizal, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Dentinger et al. 2010 (section *Boletus*, phylogeny), new spp. see Wang et al. 2014b (morphology, China).

Gastroleccinum Thiers 1989, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *G. scabrosum* (Mazzer & A.H. Sm.) Thiers, sequestrate, North America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Gastropila Homrich & J.E. Wright 1973, Lycoperdaceae, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *G. fragilis* (Lév.) Homrich & J.E. Wright, worldwide, sequence data unavailable, see Cortez et al. 2012 (Brazil, key), Rebriev and Assyov 2012 (Europe, Asia), Kirk et al. 2013 (genus accepted).

Gastrosporium Mattir. 1903, Gastrosporiaceae, Phallales, Agaricomycetes, asexual morph unknown, two species, type species *G. simplex* Mattir., ectomycorrhizal, widespread, see Kirk et al. 2013 (genus accepted), Tomaszewska et al. 2015 (ecology), sequence data available, see Trierveiler-Pereira et al. 2014a (phylogeny).

Gautieria Vittad. 1831, Gomphaceae, Gomphales, Agaricomycetes, asexual morph unknown, 37 species, type species *G. morchelliformis* Vittad., terrestrial and ectomycorrhizal, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Bau and Liu 2013 (China).

Geasteroides Long 1917, Geastraceae, Geastrales, Agaricomycetes, asexual morph unknown, one species, type species *G. texensis* Long, USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Geastrum Pers. 1794, Geastraceae, Geastrales, Agaricomycetes, asexual morph unknown, c. 130 species, type species *G. pectinatum* Pers., widespread, earthstars, terrestrial, 14 sections, sect. *Campestria* J.C.Zamora, sect. *Corollina* J.C.Zamora, sect. *Elegantia* J.C.Zamora, sect. *Exareolata* De Toni, sect. *Fimbriata* De Toni, sect. *Fornicata* De Toni, sect. *Geastrum* Pers., sect. *Hariotia* J.C.Zamora, sect. *Hieronymia* J.C.Zamora, sect. *Myceliostroma* (Henn.) P.Ponce de León, sect. *Papillata* De Toni, sect. *Pseudolimbata* J.C.Zamora, sect. *Schmidelia* J.C.Zamora, sect. *Trichaster* (Czern.) P. Ponce de León, see Kirk et al. 2013 (genus accepted), Zamora et al. 2014b (systematics, *Geastrum*), some species medicinal use (*G. fimbriatum* Fr.), see Dai and Yang 2008 (medicinal mushrooms, China), sequence data available, see Zamora et al. 2014b, 2015 (section *Schmidelia*, *Geastrum*), new spp. see Hemmes and Desjardin 2011 (Hawaii), da Silva et al. 2013a (Brazil), Kuhar et al. 2013 (Argentina), Sousa et al. 2015 (Brazil), Zamora et al. 2015 (Australia), Crous et al. 2016b, 2017b, 2018b.

Geesterania Westphalen, Tomšovský & Rajchenb. 2018, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *G. carneola* (Bres.) Westphalen & Rajchenb, resupinate porioid basidioma, wood-rotting, white rot, see Westphalen et al. 2018 (taxonomy).

Gelacantha V. Malysheva & Spirin 2019, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *G. pura* V. Malysheva & Spirin, Europe (Russian Caucasus), saprobic, on fallen log of *Abies*, sequence data available, see Spirin et al. 2019b (taxonomy, phylogeny).

Gelatoporia Niemelä 1985, Gelatoporiaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *G. subvermispora* (Pilát) Niemelä, resupinate basidioma, poroid hymenophore, wood-rotting, white rot, widespread (north temperate), see Kirk et al. 2013 (genus accepted), sequence data available, see Miettinen and Rajchenberg 2012 (phylogeny), Fernandez-Fueyo et al. 2012 (genome, as *Ceriporiopsis subvermispora*).

Gelidatrema A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Phaeotremellaceae, Tremellales, Tremellomycetes, sexual morph unknown, one species, type species *G. spencermartinsiae* (C. García, Brizzio, Boekhout, Theelen, Libkind & van Broock) A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, Europe, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Geliporus Yuan Yuan, Jia J. Chen & S.H. He 2017, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *G. exilisporus* (Y.C. Dai & Niemelä) Yuan Yuan, Jia J. Chen & S.H. He, wood-rotting, white rot, sequence data available, see Yuan et al. 2017b (Phanerochaetaceae, taxonomy, China).

Gelopellis Zeller 1939, Claustulaceae, Phallales, Agaricomycetes, asexual morph unknown, six species, type species *G. macrospora* Zeller, South America, Japan, Sustralia, see Kirk et al. 2013 (genus accepted), sequence data avaialble, see Hosaka et al. 2006 (phylogeny, gomphoid-phalloid fungi).

Geminago Vánky & R. Bauer 1996, Geminaginaceae, Ustilaginales, Ustilaginomycetes, one species, type species *G. nonveilleri* (Zambett. & Foko) Vánky & R. Bauer, plant parasite (flowers) on *Triplochiton scleroxylon* (Malvaceae), Africa, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Geminibasidium H.D.T. Nguyen, N.L. Nick. & Seifert 2013, Geminibasidiaceae, Geminibasidiales, Wallemiomycetes, asexual morph unknown, two species, type species, *G. donsium* H.D.T. Nguyen, N.L. Nickerson & Seifert, Canada, sequence data available, see Nguyen et al. 2013a (taxonomy).

Genolevuria X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Bulleraceae, Tremellales, Tremellomycetes, sexual morph unknown, four species, type species *G. amylolytica* (Á. Fonseca, J. Inácio & Spenc.-Mart.) X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, worldwide, yeast, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Georgefischeria Thirum. & Naras. 1963, Georgefischeriaceae, Georgefischeriales, Exobasidiomycetes, four species, type species *G. riveae* Thirum. & Naras., plant parasites (leaves, stems) on Convolvulaceae, India, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Bauer et al. 2001b, Begerow et al. 2014 (taxonomy).

Geotrichopsis Tzean & Estey 1991, *incertae sedis*, *incertae sedis*, Agaricomycetes, one species, type species *G. mycoparasitica* Tzean & Estey, Canada, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Gerhardtia Bon 1994, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. seven species, type species *G. incarnatobrunnea* (Ew. Gerhardt) Bon, sequence data available, see Mešić and Tkalčec 2009 (morphology, type study), Vizzini et al. 2015a (new emendation), Matheny et al. 2017a (new combination), new spp. see Cooper 2014b (New Zealand), Li et al. 2017b (China).

Gerronema Singer 1951, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, 58 species, type species *G. melanomphax* Singer, lignicolous, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Antonín et al. 2008 (Korea), new spp. see Cooper 2014b (New Zealand), Latha et al. 2018b (India).

Gerwasia Racib. 1909, Phragmidiaceae, Pucciniales, Pucciniomycetes, (= *Mainsia* H.S. Jacks. 1931), 19 species, type species *G. rubi* Racib., asexual morphs *Campanulospora* Salazar-Yepes, Pardo-Card. & Buriticá, *Morispora* Salazar-Yepes, Pardo-Card. & Buriticá, *Scutelliformis* Salazar-Yepes, Pardo-Card. & Buriticá, biotrophic on Rosaceae (*Rubus*, *Rosa*) terrestrial, Central and South America, Asia, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see McTaggart et al. 2016a (Evolution, phylogeny).

Giacomia Vizzini & Contu 2012, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *G. mirabilis* (Bres.) Vizzini & Contu, worldwide, sequence data available, see Vizzini et al. 2012b (new genus).

Gilbertsonia Parmasto 2001, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *G. angulopora* (M.J. Larsen & Lombard) Parmasto, resupinate basidioma, poroid hymenophore, wood-rotting, brown rot, USA, sequence data available, see Ortiz-Santana et al. 2013 (phylogeny, antrodia clade).

Ginnsia Sheng H. Wu & Hallenb. 2010, *incertae sedis*, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *G. viticola* (Schwein.) Sheng H.Wu & Hallenb., wood-rotting, widespread, sequence data available, see Wu et al. 2010a (new combination, *Phanerochaete*).

Giulia Tassi 1904, Corticiaceae, Corticiales, Agaricomycetes, sexual morph unknown, one species, type species *G. tenuis* (Sacc.) Tassi ex Sacc. & D. Sacc., Asia, see Kirk et al. 2013 (genus accepted), sequence data available, see Rungjindamai et al. 2008 (phylogeny).

Gjaerumia R. Bauer, M. Lutz & Oberw. 2005, Gjaerumiaceae, Georgefischeriales, Exobasidiomycetes, three species, type species *G. ossifragi* (Rostr.) R. Bauer, M. Lutz & Oberw., plant parasite (leaves) on Asparagaceae, Melanthiaceae, Xanthorrhoeaceae, Denmark, Italy, Kazakhstan, saprobic yeast states, cultures available, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Glabrocyphella W.B. Cooke 1961, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, twelve species, type species *G. palmarum* (Berk. & M.A. Curtis) W.B. Cooke, saprophytic, worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Glaciozyma Turchetti, Connell, Thomas-Hall & Boekhout 2011, Camptobasidiaceae, Kriegeriales, Microbotryomycetes, sexual and asexual morphs known, four species, type species *G. antarctica* (Fell, Statzell, I.L. Hunter & Phaff) Turchetti, Connell, Thomas-Hall & Boekhout, yeast, psychrophilic, worldwide, cultures and sequence data available, see Turchetti et al. 2011 (genus introduced, taxonomy), Wang et al. 2015e (taxonomy and phylogeny).

Gliophorus Herink 1958, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 17 species, type species *G. psittacinus* (Schaeff.) Herink, worldwide, waxcap mushrooms, sequence data available, see Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae), new spp. see Ainsworth et al. 2013 (Britain).

Globifomes Murrill 1904, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *G. graveolens* (Schwein.) Murrill, basidioma consist of overlapping stipe-less caps, poroid hymenophore, wood-inhabiting, white rot, North America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Globosomyces Jülich 1980, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *G. aggregatus* Jülich, basidioma aggregate, Borneo, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Globuliciopsis Hjortstam & Ryvarden 2004, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *G. fuegiana* Hjortstam & Ryvarden, basidioma resupinate, corticioid, wood-rotting, Central and South America, sequence data unavailable, see Kirk et al. 2008.

Globulicium Hjortstam 1973, Rickenellaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *G. hiemale* (Laurila) Hjortstam, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2006 (phylogeny), Larsson 2007b (phylogeny).

Globulisebacina Oberw., Garnica & K. Riess 2014, Sebacinaceae, Sebacinales, Agaricomycetes, asexual morph unknown, two species, type species *G. rolleyi* (L.S. Olive) Oberw., Garnica & K. Riess, sequence data available, see Oberwinkler et al. 2014 (phylogeny), new spp. see Kirschner et al. 2017 (China).

Gloeoasterostroma Rick 1938, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *G. sordidum* Rick, sequence data unavailable, see Kirk et al. 2008.

Gloeocantharellus Singer 1945, Gomphaceae, Gomphales, Agaricomycetes, asexual morph unknown, twelve species, type species *G. purpurascens* (Hesler) Singer, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Deng and Li 2008 (China, morphology), Linhares et al. 2016 (Brazil), Wartchow et al. 2017 (Brazil, morphology), new combinations see Giachini and Castellano 2011 (taxonomic classification for species in *Gomphus s. l.*).

Gloeocorticium Hjortstam & Ryvarden 1986, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *G. cinerascens* Hjortstam & Ryvarden, Argentina, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Gloeocystidiellum Donk 1931, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, eight species, type species *G. porosum* (Berk. & M.A. Curtis) Donk, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Gorjón and Hallenberg 2013 (taxonomy), new spp. see Telleria et al. 2012b (Spain).

Gloeocystidiopsis Jülich 1982, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *G. flammea* (Boidin) Jülich, resupinate, sequence data available, see Larsson and Larsson 2003 (phylogeny, taxonomy).

Gloeodontia Boidin 1966, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, eight species, type species *G. discolor* (Berk. & M.A. Curtis) Boidin, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Zhou and Dai 2013a (taxonomy, phylogeny, hydnoid Russulales), new spp. see Telleria et al. 2008b (Spain).

Gloeohypochnicium (Parmasto) Hjortstam 1987, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, two species, type species *G. analogum* (Bourdot & Galzin) Hjortstam, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Fukami et al. 2010 (biodiversity).

Gloeomucro R.H. Petersen 1980, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph unknown, ten species, type species *G. nodosus* (Linder) R.H. Petersen, widespread, genus in need of modern interpretation, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Gloeomyces Sheng H. Wu 1996, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, three species, type species *G. graminicola* Sheng H. Wu, China, Japan, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Gloeopeniophorella Rick 1934, Russulaceae, Russulales, Agaricomycetes, asexual morph unknown, six species, type species *G. rubroflava* Rick, sequence data available, see Larsson and Larsson 2003 (phylogeny, russuloid basidiomycetes).

Gloeophyllum P. Karst. 1882, Gloeophyllaceae, Gloeophyllales, Agaricomycetes, asexual morph unknown, 13 species, type species *G. sepiarium* (Wulfen) P. Karst., basidioma resupinate to pilete, hymenophore poroid to lamellate, wood-rotting, brown rot, widespread, sequence data available, see Garcia-Sandoval et al. 2011 (phylogeny), Floudas et al. 2012 (phylogeny).

Gloeoporellus Zmitr. 2018, Incrustoporiaceae, Polyporales, Agaricomycetes, asexual morph unknown, monotypic, one species, type species *G. merulinus* (Berk.) Zmitr., resupinate porioid basidioma, wood-rotting, white rot, see Zmitrovich 2018a (taxonomy).

Gloeoporus Mont. 1842, Irpicaceae, Polyporales, Agaricomycetes, asexual morph unknown, 13 species, type species *G. conchoides* Mont. [current name: *G. thelephoroides* (Hook.) G. Cunn.], poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus

accepted), Zmitrovich 2018a (taxonomy), sequence data available, new spp. see Mata and Ryvarden 2010 (morphology, Costa Rica), Yuan et al. 2016b (phylogeny, tropical China), Jung et al. 2018 (phylogeny, Uganda, Korea).

Gloeosoma Bres. 1920, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *G. vitellinum* (Lév.) Bres., cupulate, sequence data available, see Wu et al. 2001 (phylogeny).

Gloeostereum S. Ito & S. Imai 1933, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *G. incarnatum* S. Ito & S. Imai, Japan, Korea, see Kirk et al. 2013 (genus accepted), sequence data available, see Jang et al. 2015a (Korea), Jang et al. 2016 (Korea).

Gloeosynnema Seifert & G. Okada 1988, *incertae sedis*, *incertae sedis*, Agaricomycetes, two species, type species *G. ochroleucum* (Penz. & Sacc.) Seifert & G. Okada, Indonesia, Japan, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Gloiocephala Massee 1892, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 40 species, type species *G. epiphylla* Massee, worldwide, saprotrophic, see Antonín and Noordeloos 2010 (Europe, monograph), Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2006 (phylogeny), new spp. see Tkalčec and Mešić 2008 (Croatia), Adamčík et al. 2015 (China).

Gloiodon P. Karst. 1879, Bondarzewiaceae, Russulales, Agaricomycetes, asexual morph unknown, three species, type species *G. strigosus* (Sw.) P. Karst., Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Larsson 2003 (phylogeny, russuloid basidiomycetes).

Gloiothele Bres. 1920, Peniophoraceae, Russulales, Agaricomycetes, asexual morph unknown, c. twelve species, type species *G. lamellosa* (Henn.) Bres., see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Larsson 2003 (phylogeny, russuloid basidiomycetes).

Gloioxanthomyces Lodge, Vizzini, Ercole & Boertm. 2013, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *G. vitellinus* (Fr.) Lodge, Vizzini, Ercole & Boertm., North America, Newfoundland, Europe, sequence data available, see Lodge et al. 2014 (phylogeny, taxonomy).

Glomerogloea Doweld 2013, Platygloeaceae, Platygloeales, Pucciniomycetes, one species, type species *G. empetri* (D.M. Hend.) Doweld, sequence data unavailable.

Glomerulomyces A.I. Romero & S.E. López 1989, *incertae sedis*, *incertae sedis*, Agaricomycetes, one species, type species *G. fibulosus* A.I. Romero & S.E. López, Argentina, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Glomopsis D.M. Hend. 1961, Platygloeaceae, Platygloeales, Pucciniomycetes, two species, type species *G. corni* (Peck) D.M. Hend., USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Glutinoagger Sivan. & Watling 1980, *incertae sedis*, *incertae sedis*, Agaricomycetes, one species, type species *G. fibulatus* Sivan. & Watling, Seychelles, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Glyptoderma R. Heim & Perr.-Bertr. 1971, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *G. coelatum* (Pat. ex R. Heim) R. Heim & Perr.-Bertr., tropical America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Goffeauzyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Filobasidiaceae, Filobasidiales, Tremellomycetes, sexual morph unknown, six species, type species *G. gastrica* (Reiersöl & di Menna) X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, acid environments, soils, psychrophilic, widespread, cultures and sequence data available, cultures are available, see Liu et al. 2015b (taxonomy, phylogeny).

Golubevia Q.M. Wang, F.Y. Bai, Begerow & Boekhout 2015, Golubeviaceae, Golubeviales, Exobasidiomycetes, one species, type species *G. pallescens* (Gokhale) Q.M. Wang, F.Y. Bai, Begerow & Boekhout, known only from saprobic states, cultures available, sequence data available, see Begerow et al. 2000, Wang et al. 2015c (taxonomy, phylogeny).

Gomphidius Fr. 1836, Gomphidiaceae, Boletales, Agaricomycetes, asexual morph unknown, ten species, type species *G. glutinosus* (Schaeff.) Fr., widespread, some species edible (*G. glutinosus* (Schaeff.) Fr.), see Dai et al. 2010b (edible mushrooms, China), some medicinal use (*G. rutilus* (Schaeff.) S. Lundell), see Gao et al. 2013b (medicinal study), Kirk et al. 2013 (genus accepted), sequence data available, see Li et al. 2009b (phylogeny), Yu 2015 (ecology), Větrovský et al. 2016 (phylogeny), Pérez-Izquierdo et al. 2017 (phylogeny), new spp. see Qi et al. 2017 (Northeast China).

Gomphogaster O.K. Mill. 1973, Gomphidiaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *G. leucosarx* (A.H. Sm. & Singer) O.K. Mill., USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Gomphus Pers. 1797, Gomphaceae, Gomphales, Agaricomycetes, asexual morph unknown, seven species, type species *G. clavatus* (Pers.) Gray, widespread, few species are mycorrhizal, see Giachini and Castellano 2011 (taxonomic classification for species in *Gomphus s. l.*), some species edible (*G. clavatus* (Pers.) Gray), see Dai et al. 2010b (edible mushrooms, China), Makropoulou et al. 2012 (antioxidant and cytotoxic activity), Kirk et al. 2013 (genus accepted), sequence data available, new spp. see

Villegas et al. 2010 (Mexico), Petersen et al. 2014b (North America).

Goplana Racib. 1900, Chaconiaceae, Pucciniales, Pucciniomycetes, 13 species, type species *G. micheliae* Racib., biotrophic on Asteraceae, Dioscoreaceae, Euphorbiaceae, Grossulariaceae, Lauraceae, Magnoliaceae, Meliosmaceae, Rubiaceae, Vitaceae, terrestrial, worldwide, see Hernández and Cline 2010 (replaced *Goplana dioscoreae* Cummins, nom. illeg. with *Goplana dioscoreae-alatae*), Kirk et al. 2013 (genus accepted), sequence data unavailable.

Gramincola Velen. 1947, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *G. gracilis* Velen., sequence data unavailable, see Kirk et al. 2008.

Grammatus H.S. Yuan & Decock 2018, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, two species, type species *G. labyrinthinus* H.S. Yuan & Decock, wood-inhabiting, southern, tropical China, basidiomas resupinate, subporoid hymenophore, sequence data available, see Yuan et al. 2018 (phylogeny, taxonomy, China).

Grammothele Berk. & M.A. Curtis 1868, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 20 species, type species *G. lineata* Berk. & M.A. Curtis, resupinate basidioma, poroid hymenophore, wood-rotting, some species known as endophytes, widespread (tropical), see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), medicinal use, see Das et al. 2017a (compound, paclitaxel, *G. lineata*), sequence data available, see Zhou and Dai 2012a (phylogeny), Das et al. 2017a (draft genome, *G. lineata*), new spp. see Zhou and Dai 2012a (phylogeny, China), Karasiński 2015 (morphology, Bolivia), Ryvarden 2015a (morphology, Brazil, USA, Venezuela), Wu et al. 2016d (phylogeny, China), new combination, see Li and Cui 2013b (phylogeny).

Grammothelopsis Jülich 1982, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, seven species, type species *G. macrospora* (Ryvarden) Jülich, poroid hymenophore, wood-rotting, widespread (Africa, South America, China), see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data avaiable, see Li and Cui 2013b (phylogeny, *Megasporoporia*), new spp. see Dai et al. 2011 (China), Zhao and Cui 2012 (China, morphology).

Granulobasidium Jülich 1979, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *G. vellereum* (Ellis & Cragin) Jülich, North America, wood-decaying, see Kirk et al. 2013 (genus accepted), Nord et al. 2013, 2014 (compounds), sequence data available, see Larsson 2007b (phylogeny).

Graphiola Poit. 1824, Graphiolaceae, Exobasidiales, Exobasidiomycetes, twelve species, type species *G. phoenicis* (Moug. ex Fr.) Poit., plant parasites (leaves) on Arecaceae, widespread in tropics and subtropics, cultures available, see Kirk et al. 2013 (genus accepted), sequence data available, see Begerow et al. 2002, 2014, Wang et al. 2015c (phylogeny), new spp. see Nasr et al. 2019.

Grifola Gray 1821, Grifolaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *G. frondosa* (Dicks.) Gray, compound basidioma, poroid hymenophore, terrestrial or wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), some species edible, see Montoya et al. 2012b (cultivation, *G. frondosa*), some species medicinal use (*G. frondosa*, *G. gargal* Singer, *G. sordulenta* (Mont.) Singer), see Zhuang and Wasser 2004 (*G. frondosa*, review), Postemsky and Curvetto 2016 (*Grifola* spp., Argentina), sequence data available, see Binder et al. 2013 (phylogeny, Polyporales), Justo et al. 2017 (phylogeny, Polyporales).

Griseoporia Ginns 1984, Gloeophyllaceae, Gloeophyllales, Agaricomycetes, asexual morph unknown, two species, type species *G. carbonaria* (Berk. & M.A. Curtis) Ginns, sequence data available, new spp. see He et al. 2014 (phylogeny, taxonomy, genus accepted).

Guepinia Fr. 1825, *incertae sedis* Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *G. helvelloides* (DC.) Fr., terricolous, probably saprotrophic, sequence data available, Mattock 2006 (United Kingdom).

Guepiniopsis Pat. 1883, Dacrymycetaceae, Dacrymycetales, Dacrymycetes, asexual morph unknown, eight species, type species *G. tortus* Pat., wood-decaying, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Weiß and Oberwinkler 2001, new spp. see Delivorias et al. 2012 (Greece).

Gummiglobus Trappe, Castellano & Amar. 1996, Mesophelliaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, two species, type species *G. joyceae* Trappe, Castellano & Amar, Australia, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006 (phylogeny, gomphoid-phalloid fungi).

Gummivena Trappe & Bougher 2002, Mesophelliaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, one species, type species *G. potorooi* Trappe & Bougher, Australia, sequence data unavailable, see Kirk et al. 2008.

Guyanagarika Sánchez-García, T.W. Henkel & Aime 2016, Biannulariaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *G. aurantia* Sánchez-García, T.W. Henkel & Aime, associate with species of the ectomycorrhizal (ECM) tree genus *Dicymbe* (Fabaceae subfam. Caesalpinioideae), Pakaraima Mountains of Guyana in the central Guiana Shield, sequence data available, see Sánchez-García et al. 2016 (monograph, new genus).

Guyanagaster T.W. Henkel, M.E. Sm. & Aime 2010, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *G. necrorhizus* T.W. Henkel, Aime & M.E. Sm., Guyana, basidioma sequestrate, wood-decaying, sequence data available, see Henkel et al. 2010a (monograph), Moreau et al. 2015b (phylogeny), Koch et al. 2017 (phylogeny, biogeography).
Guyanaporus T.W. Henkel & M.E. Sm. 2016, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *G. albipodus* T.W. Henkel & Husbands, stipitate-pileate, presumably ectomycorrhizal, South America, sequence data available, see Henkel et al. 2016 (taxonomy).
Gymnoconia Lagerh. 1894 (= *Arthuriomyces* Cummins & Y. Hirats. 1983, = *Kunkelia* Arthur 1917), Phragmidiaceae, Pucciniales, Pucciniomycetes, four species, type species *G. interstitialis* (Schltdl.) Lagerh., biotrophic on Rosaceae, terrestrial, North America, Europe, Asia, see Kirk et al. 2013 (genus accepted), sequence data available, see McLaughlin et al. 2017 (phylogeny).
Gymnoderma Humb. 1793, Thelephoraceae, Thelephorales, Agaricomycetes, asexual morph unknown, one species, type species *G. sinuatum* Humb., Europe, wood-rotting, see Kirk et al. 2013 (genus accepted), sequence data available.
Gymnogaster J.W. Cribb 1956, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *G. boletoides* J.W. Cribb, Australia, see Kirk et al. 2013 (genus accepted), sequence data available, see Halling et al. 2012b (*Boletus*, phylogeny), Wu et al. 2016f (*Boletus*, phylogeny, China).
Gymnoglossum Massee 1891, Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *G. stipitatum* Massee, Australia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).
Gymnopanella Sand.-Leiva, J.V. McDonald & Thorn 2016, Omphalotaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *G. nothofagi* P. Sandoval-Leiva, J.V. McDonald & Thorn, Chilean Nothofagus forest, lignicolous, saprotrophic, sequence data available, see Sandoval-Leiva et al. 2016 (new genus, gymnopoid fungi, Omphalotaceae, Chile).
Gymnopaxillus E. Horak 1966, Serpulaceae, Boletales, Agaricomycetes, asexual morph unknown, four species, type species *G. morchelliformis* E. Horak, South America (temperate), Australia, see Kirk et al. 2013 (genus accepted), sequence data available, see Truong et al. 2017b (DNA-barcoding).
Gymnopilus P. Karst. 1879, Hymenogastraceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 200 species, type species *G. liquiritiae* (Pers.) P. Karst., worldwide, Lee et al. 2008a (compounds), Kirk et al. 2013 (genus accepted), sequence data available, see Guzmán-Dávalos et al. 2008 (phylogeny), Holec et al. 2016 (Europe), new spp. see Guzmán-Dávalos et al. 2009 (phylogeny), Silva-Junior and Wartchow 2015 (Brazil).
Gymnopus (Pers.) Roussel (1806), Omphalotaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 325 species, type species *G. fusipes* (Bull.) Gray, worldwide, mostly saprotrophic, some species parasitic (*G. fusipes*), some species edible (*G. nubicola* Halling), see Mata and Ovrebo 2009 (Costa Rica, Panama), Antonín and Noordeloos 2010 (Europe, monograph), Thongbai et al. 2013 (antimicrobial and cytotoxic activity), Tkalčec and Mešić 2013 (type studies, new combinations), Kirk et al. 2013 (genus accepted), Gamboa Trujillo et al. 2014 (using of *G. nubicola* as food), Dutta et al. 2015c (phylogeny, morphology, India), Ványolós et al. 2016 (compounds), sequence data available, see Wilson and Desjardin 2005 (phylogeny), Antonín and Noordeloos 2010 (Europe), Noordeloos and Gates 2012b (key, Europe), Antonín et al. 2013, 2014a (Europe, Korea), new spp. see Antonín and Legon 2008 (England), Mešić et al. 2011 (China), Cooper and Leonard 2013 (New Zealand), Petersen et al. 2014b, c (North America), Coimbra et al. 2015 (Brazil), Vizzini et al. 2015c (Turkey), Deng et al. 2016 (China), Petersen and Hughes 2016 (phylogeny, new section), Desjardin and Perry 2017 (Republic of São Tomé and Príncipe, Africa), Ryoo et al 2016 (Republic of Korea), Terashima et al. 2016 (Japan), César et al. 2018 (Mexico), new combinations see Desjardin and Perry 2017 (West Africa).
Gymnosporangium R. Hedw. ex DC. 1805 (= *Ceratitium* Rabenh. 1851 = *Ceratitium* Ces. 1879, = *Ciglides* Chevall. 1826, = *Gymnotelium* Syd. 1921, = *Podisoma* Link 1809), Pucciniaceae, Pucciniales, Pucciniomycetes, 64 species, type species *G. fuscum* DC. [current name: *G. sabinae* (Dicks.) G. Winter 1884], asexual morph *Roestelia* pro parte, biotrophic on Cupressaceae, Rosaceae (alternate hosts), Hydrangeaceae, Myricaceae, terrestrial, north temperate areas including Asia, Europe, North America, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Yun et al. 2009 (lectotype specimens, molecular analysis, key to species in Korea), Cao et al 2016, 2017a (phylogeny, China), Shen et al. 2018c (phylogeny, China).
Gyrodon Opat. 1836, Paxillaceae, Boletales, Agaricomycetes, asexual morph unknown, ten species, type species *G. sistotremoides* Opat., widespread, some species edible (*G. lividus* (Bull.) Fr.), see Dai et al. 2010b (edible mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Kennedy et al. 2011 (ecology), Osmundson et al. 2013 (DNA barcoding), Roy et al. 2013 (ecology), Wu et al. 2014b (phylogeny).
Gyrodontium Pat. 1900, Coniophoraceae, Boletales, Agaricomycetes, asexual morph unknown, three species, type species *G. henningsii* (Bres.) Pat., widespread, see

Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2010 (phylogeny), Carlier et al. 2004 (phylogeny, Etiopia), Valenzuela et al. 2013b (new records, Mexico).

Gyroflexus Raithelh. 1981, *incertae sedis*, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *G. brevibasidiatus* (Singer) Raithelh., wood-rotting, widespread, sequence data available, see Kirk et al. 2013 (genus accepted), Larsson et al. 2006 (phylogeny, taxonomy).

Gyrophanopsis Jülich 1979, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *G. zealandica* (G. Cunn.) Jülich, corticioid basidioma, wood-rotting, widespread, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Gyroporus Quél. 1886, Gyroporaceae, Boletales, Agaricomycetes, asexual morph unknown, 24 species, type species *G. cyanescens* (Bull.) Quél., poroid, ectomycorrhizal, widespread, some species edible (*G. cyanescens* (Bull.) Quél.), see Dai et al. 2010b (edible mushrooms, China), some medicinal use (*G. castaneus* (Bull.: Fr.) Quél), see Dai and Yang 2008 (medicinal mushrooms, China), Davoodian and Halling 2013 (taxonomy), Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Das et al. 2017b (Indian Himalaya), Davoodian 2018 (monograph, phylogeny).

Haasiella Kotl. & Pouzar 1966, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *H. splendidissima* Kotl. & Pouzar, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Vizzini et al. 2012c (monograph, phylogeny), Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae).

Haddowia Steyaert 1972, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *H. longipes* (Lév.) Steyaert, stipitate basidioma, poroid hymenophore, terrestrial or wood-rotting, white rot, widespread (pantropical), see Kirk et al. 2013 (genus accepted), sequence data unavailable, see Costa-Rezende et al. 2017 (phylogeny, systematics).

Haglerozyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Trichosporonaceae, Trichosporonales, Tremellomycetes, sexual morph unknown, one species, type species *H. chiarellii* (Pagnocca, Legaspe, A. Rodrigues & Ruivo) A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, insect, Brazil, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Hallenbergia Dhingra & Priyanka 2011, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, one species, type species *H. singularis* Dhingra & Priyanka, basidioma corticioid, Bhutan, sequence data unavailable, see Dhingra 2012b (monograph).

Hallingea Castellano 1996, Gallaceaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, three species, type species *H. purpurea* (Zeller & C.W. Dodge) Castellano, America, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006, 2008 (phylogeny, phylogeography).

Haloaleurodiscus N. Maek., Suhara & K. Kinjo 2005, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *H. mangrovei* N. Maek., Suhara & K. Kinjo, wood-decaying, Asia, sequence data available, see Maekawa et al. 2005 (phylogeny).

Halobasidium Z. Guo, Y.R. Wang, Q.C. Hou, W.C. Li, H.J. Zhao, Z.H. Sun & Z.D. Zhang 2019, Cystobasidiaceae, Cystobasidiales, Cystobasidiomycetes, sexual morph unknown, one species, type species *H. xiangyangense* Z. Guo, Y.R. Wang, Q.C. Hou, W.C. Li, H.J. Zhao, Z.H. Sun & Z.D. Zhang, yeast, salty sause, China, sequence data available, see Guo et al. 2019 (taxonomy).

Halocyphina Kohlm. & E. Kohlm. 1965, Niaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *H. villosa* Kohlm. & E. Kohlm., USA, marine, see Kirk et al. 2013 (genus accepted), sequence data available, see Yamaguchi et al. 2009 (phylogeny).

Hamamotoa Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, Chrysozymaceae, *incertae sedis*, Microbotryomycetes, sexual morph unknown, four species, type species *H. singularis* (Phaff & Carmo Souza) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, worldwide, yeast, cultures and sequence data available, see Wang et al. 2015e (phylogeny), new spp. see Yurkov et al. 2016.

Hamaspora Körn. 1877 (= *Hamasporella* Höhn. 1912), Phragmidiaceae, Pucciniales, Pucciniomycetes, 15 species, type species *H. longissima* (Thüm.) Körn., biotrophic on *Rubus* (Rosaceae), terrestrial, Africa, Asia, Australasia, see Kirk et al. 2013 (genus accepted), sequence data available, see McTaggart et al. 2016a (phylogeny, evolution).

Hannaella F.Y. Bai & Q.M. Wang 2008, Bulleribasidiaceae, Tremellales, Tremellomycetes, sexual morph unknown, eleven species, type species *H. sinensis* (M.X. Li) F.Y. Bai & Q.M. Wang, worldwide, yeast, cultures and sequence data available, see Wang and Bai 2008 (taxonomy and phylogeny), Liu et al. 2015b (taxonomy and phylogeny).

Hapalophragmium Syd. & P. Syd. 1901, (= *Hapalophragmiopsis* Thirum. 1950; = *Triactella* Syd. 1921), Raveneliaceae, Pucciniales, Pucciniomycetes, 18 species, type species *H. derridis* Syd. & P. Syd., biotrophic on Fabaceae, terrestrial, Africa, Asia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Hapalopilus P. Karst. 1881, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph unknown, eleven species, type species *H. nidulans* (Fr.) P. Karst. [current name: *H. rutilans* (Pers.) Murrill], poroid hymenophore,

wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), some species poisonous, see Villa et al. 2013 (polyporic acid, report, *H. rutilans*), sequence data available, see Ryvarden and Melo 2014 (new combination, morphology), Miettinen et al. 2016a (new sp., new combinations, phylogeny, morphology).

Haploporus Bondartsev & Singer 1944, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, 13 species, type species *H. odorus* (Sommerf.) Bondartsev & Singer, poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), ethnomycological use, see Blanchette 1997 (North America, *H. odorus*), sequence data available, see Shen et al. 2016 (new spp., phylogeny, monograph, China).

Harmajaea Dima, P. Alvarado & Kekki 2018, Pseudoclitocybaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *H. harperi* (Murrill) Dima & P. Alvarado, North America and North Europe, on thick forest litter, saprotrophic, sequence data available, see Alvarado et al. 2018b (taxonomy).

Harrya Halling, Nuhn & Osmundson 2012, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, six species, type species *H. chromapes* (Frost) Halling, Nuhn, Osmundson & Manfr. Binder, stipitate-pileate, North America, China, sequence data available, see Halling et al. 2012b (monograph), new spp. see Wu et al. 2016f (China).

Hasegawazyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, *incertae sedis*, Erythrobasidiales, Cystobasidiomycetes, sexual morph unknown, one species, type species *H. lactosa* (Hasegawa) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, cultures and sequence data available, see Wang et al. 2015e (taxonomy and phylogeny).

Hastodontia (Parmasto) Hjortstam & Ryvarden 2009, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, two species, type species *H. halonata* (J. Erikss. & Hjortstam) Hjortstam & Ryvarden, wood-rotting, sequence data available, see Hjortstam and Ryvarden 2009c, Riebesehl and Langer 2017 (*Hyphodontia s.l.*, phylogeny), Yurchenko et al. 2017.

Hauerslevia P. Roberts 1998, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *H. pulverulenta* (Hauerslev) P. Roberts, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Hebeloma (Fr.) P. Kumm. 1871, Hymenogastraceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 190 species, type species *H. fastibile* (Pers.) P. Kumm., worldwide, poison pie (*H. crustuliniforme* (Bull.) Quél.), see Hall et al. 2003 (poisonous mushrooms), ectomycorrhizal, see Eberhardt et al. 2009 (species associated with Cistus), Kirk et al. 2013 (genus accepted), sequence data available, Eberhardt et al. 2013, 2015a, b, 2016 (Europe, section *Theobromina*, section *Denudata*), Rees et al. 2013 (phylogeny), Grilli et al. 2016 (Europe, sections *Sinapizantia* and *Velutipes*), new spp. see Eberhardt and Beker 2010 (Europe), Beker et al. 2016 (Europe), Moreno et al. 2017a (Europe).

Heimiomyces Singer 1942, Mycenaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. seven species, type species *H. rheicolor* (Berk.) Singer [current name: *Xeromphalina tenuipes* (Schwein.) A.H. Sm.], sequence data available, see Moncalvo et al. 2002 (phylogeny), Cooper 2014c (new combination).

Heimioporus E. Horak 2004, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, 14 species, type species *H. retisporus* (Pat. & C.F. Baker) E. Horak, stipitate-pileate, sequence data available, phylogeny and new spp. see Halling et al. 2015 (Australia).

Heinemannomyces Watling 1999, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *H. splendidissima* Watling, Peninsular Malaysia, see Kirk et al. 2013 (genus accepted), sequence data available, see Vellinga et al. 2011 (phylogeny), Zhao et al. 2016f (phylogeny).

Helicobasidium Pat. 1885, Helicobasidiaceae, Helicobasidiales, Pucciniomycetes, c. six species, type species *H. purpureum* (Tul.) Pat. 1885, worldwide, pathogenic, see Soni and Verma 2010 (root rot, India), Hong et al. 2011 (violet root rot, Korea), Kirk et al. 2013 (genus accepted), sequence data available, see Lutz et al. 2004 (phylogeny).

Heitmania X.Z. Liu, F.Y. Bai, M. Groenew. & T. Boekhout 2018, *incertae sedis*, *incertae sedis*, Microbotryomycetes, sexual morph unknown, three species, type species *H. litseae* X.Z. Liu, F.Y. Bai, M. Groenew. & T. Boekhout, three species, yeast, plant material, China, cultures and sequence data available, see Liu et al. 2017f (description, phylogeny).

Helicogloea Pat. 1892, Phleogenaceae, Atractiellales, Atractiellomycetes, asexual morph known, 25 species, type species *H. lagerheimii* Pat., presumable saprobic, on decaying plant remnants, on (decaying) fungi, worldwide, sequence data available, see Bauer et al. 2006 (phylogeny), see Aime et al. 2018c (phylogeny, taxonomy), new spp. see Schoutteten et al. 2018 (Belgium), Spirin et al. 2018c (phylogeny, taxonomy).

Helicomyxa R. Kirschner & Chee J. Chen 2004, Hyaloriaceae, Auriculariales, Agaricomycetes, asexual morph, one species, type species *H. everhartioides* R. Kirschner & Chee J. Chen, China, wood-rotting, sequence data available, see Kirschner and Chen 2004 (taxonomy, phylogeny).

Heliocybe Redhead & Ginns 1985, Gloeophyllaceae, Gloeophyllales, Agaricomycetes, asexaul morph unknown, one species, type species *H. sulcata* (Berk.) Redhead & Ginns, brown rot, wood-rotting, sequence data available,

see Garcia-Sandoval et al. 2011 (phylogeny, Gloeophyllales, brown rot Agaricomycotina), new spp. see Zhang et al. 2018 (China).

Heliogaster Orihara & K. Iwase 2010, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *H. columellifer* (Kobayasi) Orihara & K. Iwase, sequestrate, ectomycorrhizal, Asia, sequence data available, see Orihara et al. 2010 (taxonomy).

Helvellosebacina Oberw., Garnica & K. Riess 2014, Sebacinaceae, Sebacinales, Agaricomycetes, asexual morph unknown, two species, type species *H. helvelloides* (Schwein.) Oberw., Garnica & K. Riess, worldwide, ectomycorrhizal, sequence data available, see Oberwinkler et al. 2014 (new combination, phylogeny).

Hemigaster Juel 1895, Hemigasteraceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *H. candidus* Juel, Sweden, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Hemileccinum Šutara 2008, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, five species, type species *H. impolitum* (Fr.) Šutara, stipitate-pileate, ectomycorrhizal, Europe, North America, Asia, sequence data available, see Halling et al. 2015 (new combination), Wu et al. 2016f (phylogeny, new combination and new sp., Asia).

Hemileia Berk. & Broome 1869 (= *Hemileiopsis* Racib. 1900, = *Wardia* J.F. Hennen & M.M. Hennen, in Cummins & Hiratsuka 2003 [nom. inval.]), *incertae sedis*, Pucciniales, Pucciniomycetes, asexual morph previously known in *Wardia* J.F. Hennen & M.M. Hennen, c. 55 species, type species *H. vastatrix* Berk. & Broome, biotrophic on Apocynaceae, Lamiaceae, Oleaceae, Phyllanthaceae, Rubiaceae, terrestrial, circumglobal in tropics, especially Africa and Asia, see Mohanan 2010 (new species), Kirk et al. 2013 (genus accepted), Judith and Rossman 2014 (new combinations based on one fungus, one name concept), sequence data available, see Carvalho et al. 2011 (genetic diversity, coffee rust).

Hemimycena Singer 1938, Mycenaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 60 species, type species *H. lactea* (Pers.) Singer, worldwide, see Antonín and Noordeloos 2004 (Europe), Læssøe and Elborne 2012 (key), Malysheva and Morozova 2009 (European Russia, notes), Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Walther et al. 2005 (phylogeny), Matheny et al. 2006 (phylogeny), Osmundson et al. 2013 (DNA barcode), new spp. see Niveiro et al. 2014a (Atlantic Forest), Lehmann and Lüderitz 2018 (Germany).

Hemistropharia Jacobsson & E. Larss. 2007, Tubariaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *H. albocrenulata* (Peck) Jacobsson & E. Larss., sequence data available, see Jacobsson and Larsson 2007 (phylogeny, taxonomy).

Hennenia Buriticá 1995, *incertae sedis*, Pucciniales, Pucciniomycetes, one species, type species *H. ditelia* Buriticá, biotrophic on Annonaceae (*Annona*), terrestrial, Colombia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Henningsia Möller 1895, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *H. brasiliensis* (Speg.) Speg., merulioid to poroid hymenophore, wood-rotting, widespread (Neotropical), see Kirk et al. 2013 (genus accepted), sequence data unavailable, new spp. see Gibertoni and Ryvarden 2014 (morphology).

Henningsomyces Kuntze 1898, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. 21 species, type species *H. candidus* (Pers.) Kuntze, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Bodensteiner et al. 2004 (phylogeny, cyphelloid homobasidiomycetes), Wei and Qin 2009 (cyphelloid fungi, China).

Hericium Pers. 1794, Hericiaceae, Russulales, Agaricomycetes, asexual morph unknown, c. 23 species, type species *H. coralloides* (Scop.) Pers., wood-decaying, worldwide, some species edible (*H. alpestre* Pers.), some species of medicinal use (*H. coralloides* (Scop.: Fr.) Pers.), see Dai and Yang 2008 (medicinal mushrooms, China), Mori et al. 2008b (natural products), Dai et al. 2010b (edible mushrooms, China), Khan et al. 2013 (*H. erinaceus* (Bull.) Pers.), Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Larsson 2003, Park et al. 2004, Miller et al. 2006 (phylogeny), new spp. see Das et al. 2011, 2013b (Sikkim Himalaya, India), Hallenberg et al. 2013 (southern South America).

Herpobasidium Lind 1908, Eocronartiaceae, Platygloeales, Pucciniomycetes, six species, type species *H. filicinum* (Rostr.) Lind, worldwide, sequence data availabnle, see Maier et al. 2003 (phylogeny), Kirk et al. 2013 (genus accepted).

Hermanssonia Zmitr. 2018, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, monotypic, one species, type species *H. centrifuga* (P. Karst.) Zmitr., phlebioid basidioma, wood-rotting, white rot, see Zmitrovich 2018a (taxonomy).

Heteroacanthella Oberw. 1990 (= *Acanthellorhiza* P. Roberts 1999 *fide* Art. 59.1), *incertae sedis, incertae sedis*, Agaricomycetes, asexual morph previously known in *Acanthellorhiza* P. Roberts 1999, three species, type species *H. variabilis* Oberw. & Langer, China, USA, British Isles, lichenicolous basidiomycete (*H. ellipsospora*), see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Zamora and Pérez-Ortega 2014 (Spain).

Heterobasidion Bref. 1888, Bondarzewiaceae, Russulales, Agaricomycetes, asexual morph unknown, 15 species, type species *H. annosum* (Fr.) Bref., worldwide, wood-decaying, some species cause root rot, see Vainio et al. 2011 (host diversity), Garbelotto and Gonthier 2013 (pathogenic), Kirk et al. 2013 (genus accepted), sequence data available, see Dalman et al. 2010 (evolutionary history, *H. annosum s. l.*), Olson et al. 2012 (genome), Chen et al. 2015d (monograph), new spp. see Dai and Korhonen 2009 (derived from the *H. insulare* complex), Tokuda et al. 2009 (East Asia), Otrosina and Garbelotto 2010 (North America), Chen et al. 2014 (eastern Himalayas).

Heterocephalacria Berthier 1980, Filobasidiaceae, Filobasidiales, Tremellomycetes, sexual and asexual morph known, eight species, type species *H. solida* Berthier, yeast, mycoparasite, worldwide, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Heterochaete Pat. 1892, Auriculariaceae, Auriculariales, Agaricomycetes, asexual morph unknown, c. 40 species, type species *H. andina* Pat. & Lagerh., widespread (esp. tropical), see Kirk et al. 2013 (genus accepted), sequence data available, see Sotome et al. 2014 (Asian species, poroid Auriculariales, phylogeny), Bandara et al. 2017 (Thailand, phylogeny).

Heterodoassansia Vánky 1993, Doassansiaceae, Doassansiales, Exobasidiomycetes, eight species, type species *H. morotiana* (Zundel) Vánky, plant parasites (leaves, petioles and stems) on various aquatic or paludal mono- and dicots, widespread, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Heteromycophaga P. Roberts 1997, *incertae sedis*, *incertae sedis*, Tremellomycetes, sexual morph unknown, two species, type species *H. glandulosae* P. Roberts, Great Britain, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Heteroradulum Lloyd ex Spirin & Malysheva 2017, Auriculariaceae, Auriculariales, Agaricomycetes, asexul morph unknown, seven species, type species *H. kmetii* (Bres.) Spirin & Malysheva, wood-rotting, on dry branches and logs of deciduous trees, sequence data available, see Malysheva and Spirin 2017 (stereoid fungi, Auriculariales, phylogeny).

Heterorepetobasidium Chee J. Chen & Oberw. 2002, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, two species, type species *H. subglobosum* Chee J. Chen & Oberw., China, sequence data unavailable, see Kirk et al. 2008.

Heteroscypha Oberw. & Agerer 1979, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *H. applanata* (P.H.B. Talbot) Oberw. & Agerer, S. Africa, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Heterotextus Lloyd 1922, Dacrymycetaceae, Dacrymycetales, Dacrymycetes, asexual morph unknown, six species, type species *H. flavus* Lloyd, wood-decaying, sequence data available, see Shirouzu et al. 2017 (phylogeny).

Heterotolyposporium Vánky 1997, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, two species, type species *H. lepidospermatis* Vánky, plant parasites (various plant parts) on genera *Lepidosperma* (Cyperaceae) and Juncus (Juncaceae), Southern Africa, Australasia, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014, Nasr et al. 2014a (taxonomy).

Hexagonia Fr. 1835, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, 17 species, type species *H. hirta* (P. Beauv.) Fr., poroid hymenophore, wood-rotting, white rot, widespread (esp. tropical), see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Justo et al. 2017 (phylogeny, Polyporales), new sp. see Härkönen et al. 2015 (morphology, Zambia).

Hiatulopsis Singer & Grinling 1967, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *H. amara* (Beeli) Singer & Grinling, Brazil, Congo, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Hirticlavula J.H. Petersen & Læssøe 2014, Clavariaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *H. elegans* J.H. Petersen & Læssøe, Denmark, Norway, clavarioid, sequence data available, see Petersen et al. 2014a (taxonomy).

Hispidaedalea Y.C. Dai & S.H. He 2014, Gloeophyllaceae, Gloeophyllales, Agaricomycetes, asexual morph unknown, one species, type species *H. imponens* (Ces.) Y.C. Dai & S.H. He, wood-decaying, China, sequence data available, see He et al. 2014 (taxonomy, phylogeny).

Hispidocalyptella E. Horak & Desjardin 1994, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *H. australis* E. Horak & Desjardin, saprophytic, Australia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Hobsonia Berk. ex Massee 1891, Phleogenaceae, Atractiellales, Atractiellomycetes, possibly synonym of *Helicogloea*, only known as hyphomecetous asexual morph, sexual morph unknown, two species, type species *H. mirabilis* (Peck) Linder, presumably saprobic, on plant material, wide spread (mainly tropical but recent discoveries in Europe), sequence data available, see Sikaroodi et al. 2001 (phylogeny, lichenicolous fungi), Kirschner 2004 (phylogeny), Aime et al. 2018c (phylogeny).

Hodophilus R. Heim 1958, Clavariaceae, Agaricales, Agaricomycetes, asexual morph unknown, 13 species, type species *H. foetens* (W. Phillips) Birkebak & Adamcík, wordwide, sequence data avaialble, new spp., new

combination see Birkebak et al. 2016 (Clavariaceae, phylogeny, new genus), Adamčík et al. 2016a, 2017a, b (North America, *Hodophilus* with naphthalene odours, Europe, *H. foetens* complex).

Hoehnelogaster Lohwag 1926, Paxillaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *H. microsporus* Lohwag, sequence data unavailable, see Kirk et al. 2008.

Hohenbuehelia Schulzer 1866 (= *Nematoctonus* Drechsler 1941), Pleurotaceae, Agaricales, Agaricomycetes, asexual morph was previously known in *Nematoctonus* Drechsler, c. 50 species, type species *H. petaloides* (Bull.) Schulzer, worldwide, some species edible, mukitake, *H. serotina* (Pers.) Singer [current name *Sarcomyxa serotina* (Pers.) P. Karst.], see Hall et al. 2003 (edible mushrooms), Henrici 2009 (Britain), Kirk et al. 2013 (genus accepted), sequence data available, see Koziak et al. 2007 (phylogeny), new spp. see Liu and Bau 2009 (China).

Holocotylon Lloyd 1906, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *H. brandegeeanum* Lloyd, subtropical America, see Kirk et al. 2013 (genus accepted), sequence data available, see Bates et al. 2009 (phylogeny).

Holtermannia Sacc. & Traverso 1910, Holtermanniaceae, Holtermanniales, Tremellomycetes, sexual and asexual morphs known, eight species, type species *H. pinguis* (Holterm.) Sacc. & Traverso, gelatinous fruiting bodies, yeast, southeast Asia, Brazil, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Wuczkowski et al. 2011 (phylogeny), Kurtzman and Boekhout 2017 (overview).

Holtermanniella Libkind, Wuczk., Turchetti & Boekhout 2011, Holtermanniaceae, Holtermanniales, Tremellomycetes, sexual morph unknown, five species, type species *H. takashimae* Wuczkowski, Passoth, Andersson, Turchetti, Prillinger, Boekhout, yeast, soil, widespread, cultures and sequence data available, see Wuczkowski et al. 2011 (taxonomy), Liu et al. 2015b (phylogeny).

Homophron (Britzelm.) Örstadius & E. Larss. 2015, Psathyrellaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *H. spadiceum* (P. Kumm.) Örstadius & E. Larss., in Örstadius, Ryberg & Larsson, worldwide, sequence data available, see Örstadius et al. 2015 (phylogeny, Psathyrellaceae, psathyrelloid species).

Horakiella Castellano & Trappe 1992, Sclerodermataceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *H. clelandii* (Rodway) Castellano & Trappe, Australia, basidiomas sequestrate, see Kirk et al. 2013 (genus accepted), sequence data unavailable, new spp. see Trappe et al. 2010 (Australian outback, African Kalahari).

Hormographiella Guarro & Gené 1992, Psathyrellaceae, Agaricales, Agaricomycetes, sexual morph *Coprinellus* P. Karst. 1879, three species, type species *H. aspergillata* Guarro, Gené & De Vroey, worldwide, some species pathogenic (*H. aspergillata* Guarro, Gené & De Vroey), see Conen et al. 2011 (human pathogen), Suarez et al. 2011 (human pathogen), sequence data available, see Irinyi et al. 2015 (DNA barcode, human pathogen).

Hormomyces Bonord. 1851, Tremellaceae, Tremellales, Tremellomycetes, sexual morph unknown, six species, type species *H. aurantiacus* Bonord., worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Hornodermoporus Teixeira 1993, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *H. martius* (Berk.) Teixeira, perennial basidioma, poroid hymenophore, wood-rotting, white rot, widespread (pantropical), see Vizzini 2015 (taxonomy), sequence data available, see Zhao and Cui 2013c (phylogeny, *Perenniporia s. l.*), Zhao et al. 2015b (phylogeny, *Abundisporus*).

Hortiboletus Simonini, Vizzini & Gelardi 2015, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, seven species, type species *H. rubellus* (Krombh.) Simonini, Vizzini & Gelardi, stipitate-pileate, ectomycorrhizal, Europe, North America, Asia, sequence data available, see Wu et al. 2016f (phylogeny, new combination and new spp., Asia), new sp. see Das et al. 2016 (Asia).

Hourangia Xue T. Zhu & Zhu L. Yang 2015, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, four species, type species *H. cheoi* (W.F. Chiu) Xue T. Zhu & Zhu L. Yang, China, stipitate-pileate, ectomycorrhizal, Japan, Malaysia, Indonesia, sequence data available, see Wu et al. 2014b (phylogeny), Zhu et al. 2015 (taxonomy, phylogeny).

Humidicutis (Singer) Singer 1959, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, twelve species, type species *H. marginata* (Peck) Singer, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny and Bougher 2006 (phylogeny), Lodge et al. 2014 (phylogeny, taxonomy, Hygrophoraceae), Lavorato et al. 2015 (phylogeny).

Humphreya Steyaert 1972, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, four species, type species *H. lloydii* (Pat. & Har.) Steyaert, stipitate basidioma, poroid hymenophore, terrestrial, white rot, widespread (pantropical), see Kirk et al. 2013 (genus accepted), sequence data unavailable, see Costa-Rezende et al. 2017 (phylogeny, systematics).

Hyalodon Malysheva & Spirin 2018, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, two species, type species *H. piceicola* (Kühner ex Bourdot) Malysheva & Spirin., East Asia and Europe, wood-rotting,

sequence date available, see Malysheva et al. 2018 (taxonomy).

Hyalopsora Magnus 1902, Pucciniastraceae, Pucciniales, Pucciniomycetes, 21 species, type species *H. aspidiotus* (Peck) Magnus, biotrophic on Pinaceae (alternate hosts), Polypodiaceae, terrestrial, see Berndt 2008b (new name), Saba et al. 2012 (new name), sequence data available, see Padamsee and Mckenzie 2014 (phylogeny).

Hyalopycnis Höhn. 1918, Heterogastridiaceae, Heterogastridiales, Microbotryomycetes, asexual morph known, one species, type species *H. pycnidioideum* Oberw. & R. Bauer, mycoparasitic, isolated from other fungi and decaying plant material, distribution north temperate, see Aime et al. 2018b (competing names), sequence data available, see Aime et al. 2006 (phylogeny), Bauer et al. 2006 (phylogeny, simple-septate basidiomycetes), Aime et al. 2014 (phylogeny).

Hyaloria Möller 1895, Hyaloriaceae, Auriculariales, Agaricomycetes, asexual morph unknown, three species, type species *H. pilacre* Möller, wood-decaying, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Weiß and Oberwinkler 2001 (taxonomy and phylogeny).

Hybogaster Singer 1964, Hybogasteraceae, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *H. giganteus* Singer, terrestrial, Europe, see Kirk et al. 2013 (genus accepted), sequence data unavailable.

Hydnangium Wallr. 1839, Hydnangiaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 20 species, type species *H. carneum* Wallr., worldwide, sequence data available, new spp. see Cooper 2014b (New Zealand).

Hydnellum P. Karst. 1879, Bankeraceae, Thelephorales, Agaricomycetes, asexual morph unknown, 39 species, type species *H. suaveolens* (Scop.) P. Karst., worldwide, terrestrial and ectomycorrhizal, see Kirk et al. 2013 (genus accepted), sequence data available, see Baird et al. 2013a (phylogeny).

Hydnochaete Bres. 1896, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *H. badia* Bres., wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Dai and Li 2010 (China), considered as a synonym of *Hymenochaete* Lév in Baltazar et al. 2014b (phylogeny and taxonomy).

Hydnocristella R.H. Petersen 1971, Lentariaceae, Gomphales, Agaricomycetes, asexual morph unknown, two species, type species *H. himantia* (Schwein.) R.H. Petersen, wood-decaying, North Americal, China, see Kirk et al. 2013 (genus accepted), sequence data available, see Jang et al. 2016, new spp. see Chen et al. 2015c (China).

Hydnodon Banker 1913, Hydnodontaceae, Trechisporales, Agaricomycetes, asexual morph unknown, one species, type species *H. thelephorus* (Lév.) Banker, wood-decaying, Europe, sequence data available, see Larsson et al. 2011 (phylogeny).

Hydnomerulius Jarosch & Besl 2001, Paxillaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *H. pinastri* (Fr.) Jarosch & Besl, sequence data available, see Binder et al. 2010 (phylogeny), Nuhn et al. 2013 (phylogeny, Boletineae).

Hydnophanerochaete Sheng H. Wu & C.C. Chen 2018, Meruliaceae, Polyporales, Agaricomycetes, one species, type species *H. odontoidea* (Sheng H. Wu) Sheng H. Wu & C.C. Chen, see Chen et al. 2018 (phylogeny, taxonomy).

Hydnophlebia Parmasto 1967, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *H. chrysorhiza* (Torr.) Parmasto, resupinate basidioma, hydnoid hymenophore, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Floudas and Hibbett 2015 (phylogeny, *Phanerochaete*, part of the phlebia clade), Yuan et al. 2017b (phylogeny), new spp. see Telleria et al. 2017 (phylogeny, Macaronesian Islands, monograph).

Hydnopolyporus D.A. Reid 1962, Irpicaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *H. fimbriatus* (Cooke) D.A. Reid, wood-rotting, white rot, widespread (tropical), edible species (*H. fimbriatus*), see Sanuma et al. 2016 (edible mushrooms, Brazil), see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Sjökvist et al. 2012 (phylogeny, stipitate stereoid fungi).

Hydnum L. 1753, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph unknown, 49 species, type species *H. repandum* L., ectomycorrhizal, widespread, some species edible (*H. repandum* L.), see Dai et al. 2010b (edible mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Feng et al. 2016 (phylogeny), Pérez-Izquierdo et al. 2017 (phylogenetic marker), new spp. see Olariaga et al. 2012 (Iberian Peninsula), Vizzini et al. 2013c (Italy), Yanaga et al. 2015 (Japan), Buyck et al. 2017 (USA), Niskanen et al. 2018 (North America, Europe), Wang et al. 2018e (India).

Hydrophana V. Malysheva & Spirin 2019, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *H. sphaerospora* (Bourdot & Galzin) V. Malysheva & Spirin, Europe (Denmark, France, Norway), saprobic, on fallen logs and twigs of deciduous trees in moist places, sequence data available, see Spirin et al. 2019b (taxonomy, phylogeny).

Hydropus Kühner ex Singer 1948, Mycenaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 100 species, type species *H. fuliginarius* (Batsch) Singer, worldwide, saprophytic, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny et al. 2006

(phylogeny), Osmundson et al. 2013 (DNA barcode), see Kluthe et al. 2016 (Kenya), Antonín et al. 2019 (phylogeny), new spp. see Gminder 2013 (Germany), Pinheiro et al. 2013 (Brazil)

Hygroaster Singer 1955, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *H. nodulisporus* (Dennis) Singer, tropical America, see Kirk et al. 2013 (genus accepted), sequence data available, see Lodge et al. 2014 (phylogeny, taxonomy, Hygrophoraceae), new spp. see Vrinda et al. 2012 (India).

Hygrocybe (Fr.) P. Kumm. 1871, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 120 species, type species *H. conica* (Schaeff.) P. Kumm., two subgenera, *Hygrocybe* (Fr.) P. Kumm. and *Pseudohygrocybe* Bon, seven sections, worldwide, ectomycorrhizal, waxcap, Vrinda et al. 2009 (India), Ronikier and Borgen 2010 (Poland), Halbwachs et al. 2013 (habitats), Kirk et al. 2013 (genus accepted), sequence data available, see Babos et al. 2011 (phylogeny, taxonomy), Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae), new spp. see Læssøe and Boertmann 2008 (Ecuador), Senthilarasu et al. 2010b (India), Wang et al. 2013a, 2015a (China), Vizzini et al. 2015b (Brazil).

Hygrophorocybe Vizzini & Contu 2014, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *H. nivea* (Velen.) Vizzini & Contu, on litter, usually in conifer woods, sequence data unavailable, see Vizzini and Contu 2014.

Hygrophoropsis (J. Schröt.) Maire ex Martin-Sans 1929, Hygrophoropsidaceae, Boletales, Agaricomycetes, asexual morph unknown, 16 species, type species *H. aurantiaca* (Wulfen) Maire, widespread, some species edible (*H. aurantiaca* (Wulfen) Maire), see Dai et al. 2010b (edible mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Holec and Kolařík 2013a (Czech Republic, phylogeny), Garnica et al. 2016 (phylogeny), Větrovský et al. 2016 (ecology), Truong et al. 2017b (diversity).

Hygrophorus Fr. 1836, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 200 species, type species *H. eburneus* (Bull.: Fr.) Fr., three subgenera: *Hygrophorus* [autonym] 1849, *Colorati* (Bataille) E. Larss. 2014, *Camarophylli* Fr. 1849 emend. 2014, nine sections, ectomycorrhizal, worldwide, some species edible (*H. eburneus* (Bull.) Fr.), see Hall et al. 2003 (edible mushrooms), Ouzouni et al. 2009 (compounds), Dai et al. 2010b (Chinese edible mushrooms), Dentinger et al. 2011 (DNA barcode), Kirk et al. 2013 (genus accepted), Zhu et al. 2013 (compounds), sequence data available, see Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae), new spp. see Larsson et al. 2014a (Finland), Endo et al. 2018 (Japan), Huang et al. 2018 (China), Larsson et al. 2018b (North Europe, phylogeny, new species), Pierre-Arthur et al. 2018 (Europe, North America, phylogeny, new sp.), Sesli et al. 2018a (Turkey).

Hymenagaricus Heinem. 1981, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, 20 species, type species *H. hymenopileus* (Heinem.) Heinem., tropical worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny et al. 2006 (phylogeny), Zhao et al. 2010 (phylogeny), new spp. see Ge et al. 2008a (China), Mwanga and Tibuhwa 2014 (Tanzania).

Hymenoboletus Y.C. Li & Zhu L. Yang 2016, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *H. luteopurpureus* Y.C. Li & Zhu L. Yang, stipitate-pileate, China, sequence data available, see Wu et al. 2016f (monograph, boletes).

Hymenochaete Lév. 1846, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, 149 species, type species *H. rubiginosa* (Dicks.) Lév., basidioma resupinate, pileate or stipitate, hymenophore smooth, rugose, raduloide to hydnoide, wood-rotting, white rot, see Kirk et al. 2013 (genus accepted), sequence data available, see He and Dai 2012 (taxonomy, phylogeny, China, Hymenochaetaceae), Parmasto 2013, Parmasto et al. 2014 (phylogeny), new spp. see He and Li 2011 (China), Gomes-Silva et al. 2012a (new combination, key, Amazonia and the Atlantic Forest, Brazil), Pan and Zhou 2016 (Thailand), He et al. 2017b (China), Nie et al. 2017 (on bamboos, east Asia), new spp. Contreras-Pacheco et al. 2018 (morphology, Mexico).

Hymenochaetopsis S.H. He & Jiao Yang 2016 (= *Pseudochaete* T. Wagner & M. Fisch. 2002), Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, 16 species, type species *H. tabacina* (Sowerby) S.H. He & Jiao Yang, be proposed to replace *Pseudochaete*, wood-rotting, white rot, sequence data available, see He and Li 2013b (new spp., China, as *Pseudochaete*), Yang et al. 2016b (phylogeny, new spp., China).

Hymenogaster Vittad. 1831, Hymenogastraceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 170 species, type species *H. citrinus* Vittad., false truffles, ectomycorrhizal, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Stielow et al. 2011 (monograph).

Hymenogloea Pat. 1900, Marasmiaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *H. riofrioi* (Pat.) Pat., saprophytic, tropical America, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny). Recognized as a synonym of *Marasmius* (Desjardin unpubl. data)

Hymenogramme Mont. & Berk. 1844, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *H. javensis* Mont. & Berk.,

resupinate basidioma, hymenophore consisting of long anastomosing sterile ridges, wood-rotting, Southeast Asia, sequence data unavailable, see Kirk et al. 2013 (genus accepted), Justo et al. 2017 (phylogeny, Polyporales).

Hymenopellis R.H. Petersen 2010, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 50 species, type species *H. radicata* (Relhan) R.H. Petersen, worldwide, sequence data available, see Petersen and Hughes 2010 (taxonomy).

Hymenoporus Tkalčec, Mešić & Chun Y. Deng 2015, Omphalotaceae, Agaricales, Agaricomycetes, aseuxal morph unknown, one species, type species *H. paradoxus* Tkalčec, Mešić & Chun Y. Deng, saprobic, poroid hymenophore adnate to a free collarium, China, sequence data available, see Tkalčec et al. 2015 (monograph).

Hyphoderma Wallr. 1833, Hyphodermataceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 20 species (genus shown to be polyphyletic, see Justo et al. 2017), type species *H. setigerum* (Fr.) Donk, basidioma corticioid, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2013 (phylogeny, Polyporales), new spp. see Dhingra et al. 2009 (morphology, India), Hjortstam et al. 2009 (morphology, corticioid fungi, Kimberley region, Western Australia), Singh et al. 2010b (morphology, India), Dhingra 2012a (morphology, India), Tellería et al. 2012a (new combination, phylogeny, Canary Island), Yurchenko and Wu 2014b, c (morphology, China), Kaur et al. 2015c (morphology, India), new combinations see Nakasone 2008 (type study, *H. crustulinum*), Baltazar et al. 2016 (type study, *H. cinereoalbum*, *H. molliusculum*).

Hyphodermella J. Erikss. & Ryvarden 1976, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph unknown, seven species, type species *H. corrugata* (Fr.) J. Erikss. & Ryvarden, worldwide, white-rot corticioid fungus, see Kirk et al. 2013 (genus accepted), sequence data available, see Telleria et al. 2010a (morphology, phylogeny, Western Mediterranean area), new spp. see Duhem and Buyck 2011d (morphology, France), Zhao et al. 2017a (phyogeny, China).

Hyphodontia J. Erikss. 1958, Schizoporaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, 86 species, type species *H. pallidula* (Bres.) J. Erikss., wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), Yurchenko and Wu 2016 (key), sequence data available, new spp. see Yurchenko and Wu 2014a (China), Riebesehl et al. 2015 (La Réunion), Chen et al. 2016d, 2017a (China), Wang and Chen 2017 (China).

Hyphodontiastra Hjortstam 1999, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *H. virgicola* Hjortstam & Melo, corticioid basidioma, wood-rotting, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Hyphodontiella Å. Strid 1975, Clavariaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *H. multiseptata* A. Strid, Nordic, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson 2007b (phylogeny).

Hypholoma (Fr.) P. Kumm. 1871, Strophariaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 45 species, type species *H. fasciculare* (Huds.) P. Kumm., saprotroph, worldwide, see Cortez and Silveira 2007 (Brazil), Antonín et al. 2009 (central Europa, new sp.), Kirk et al. 2013 (genus accepted), sequence data available, see Ramírez-Cruz et al. 2013a (phylogeny), Matheny et al. 2015 (phylogeny).

Hyphoradulum Pouzar 1987, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *H. conspicuum* Pouzar [current name *Pseudolagarobasidium conspicuum* (Pouzar) Nakasone], Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Hypochnella J. Schröt. 1888, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, two species, type species *H. violacea* Auersw. ex J. Schröt., Europe, see Kirk et al. 2013 (genus accepted), sequence data unavailable, new spp. see Coelho et al. 2010 (Brazil and Argentina).

Hypochniciellum Hjortstam & Ryvarden 1980, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, one species, type species *H. ovoideum* (Jülich) Hjortstam & Ryvarden, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2010 (phylogeny).

Hypochnicium J. Erikss. 1958, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, c. 30 species (needs revision since genus shown to be polyphyletic, see Justo et al. 2017), type species *H. bombycinum* (Sommerf.) J. Erikss., corticioid basidioma, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Justo et al. 2017 (phylogeny, Polyporales), new spp. see Tellería et al. 2010b (re-evaluation, phylogeny, Bioko, Spain), Crous et al. 2013 (phylogeny, Chile), Gorjón and Hallenberg 2013 (morphology, Chile), Jang et al. 2013b (phylogeny, East Asia), Adamčík et al. 2015 (phylogeny, China), new combinations see Gorjón and Greslebin 2012 (type study, morphology, New Zealand).

Hypsizygus Singer 1947, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *H. tessulatus* (Bull.) Singer, worldwide, some species edible, shimeji (*H. marmoreus* (Peck) H. E. Bigelow), see Hall et al. 2003 (edible mushrooms), Dai et al. 2010b (Chinese edible mushrooms), some medical use, Bunashimeji (*H. marmoreus* (Peck) H.E. Bigelow), see Mori et al. 2008a (medical study), Kirk et al. 2013 (genus

accepted), sequence data available, see Wang et al. 2009 (species genetic study), Qiu et al. 2014 (species genetic study), Hofstetter et al. 2014 (phylogeny, Lyophyllaceae), Bellanger et al. 2015 (phylogeny).

Hysterangium Vittad. 1831, Hysterangiaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, c. 54 species, type species *H. clathroides* Vittad., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available see Hosaka et al. 2008 (biogeography), Brock et al. 2009 (DNA barcoding), Giachini et al. 2010 (phylogeny), Osmundson et al. 2013 (DNA barcoding), Smith et al. 2013 (phylogeny), new spp. see Guevara-Guerrero et al. 2008 (Mexico), Elliott et al. 2015 (Australia), Voglmayr and Clémençon 2016 (North America and Europe).

Ileodictyon Tul. & C. Tul. 1844, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, two species, type species *I. cibarium* Tul. & C. Tul, terrestrial, widespread (esp. southern hemisphere), see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006 (phylogeny, gomphoid-phalloid fungi), Giachini et al. 2010 (phylogeny Gomphales).

Imleria Vizzini 2014, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, five species, type species *I. badia* (Fr.) Vizzini, stipitate-pileate, ectomycorrhizal, Europe, North America, Asia, *I. badia* widely consumed, see Boa 2004, Bessette et al. 2017 (Eastern North America), sequence data available, see Nuhn et al. 2013, Wu et al. 2014b, 2016f (phylogeny), new spp. and combinations see Zhu et al. 2014 (Asia).

Imperator G. Koller, Assyov, Bellanger, Bertéa, Loizides, G. Marques, P.-A. Moreau, J.A. Muñoz, Oppicelli, Puddu & F. Richard 2015, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, three species, type species *I. torosus* (Fr.) Assyov, Bellanger, Bertéa, Courtec., G. Koller, Loizides, G. Marques, J.A. Muñoz, N. Oppicelli, D. Puddu, F. Rich. & P.-A. Moreau, sequence data avaiblable, see Assyov et al. 2015 (taxonomy).

Incrustocalyptella Agerer 1983, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *I. columbiana* Agerer, Colombia, Papua New Guinea, Hawaiian, USA, Thailand, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Incrustoporia Domański 1963, Incrustoporiaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *I. stellae* (Pilát) Domański, the generic limit of *Incrustoporia* is not currently settled, poroid hymenophore, wood-rotting, sequence data available, see Justo et al. 2017 (phylogeny, Polyporales), new combinations see Zmitrovich 2018a (taxonomy).

Indoporus A. Parihar, K. Das, Hembrom & Vizzini 2018, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *I. shoreae* A. Parihar, K. Das, Hembrom & Vizzini, epigeous, ectomycorrhizal with dipterocarps, tropical India, sequence data available, see Parihar et al. 2018b (taxonomy).

Inflatostereum D.A. Reid 1965, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *I. glabrum* (Pat.) D.A. Reid, stipitate stereoid basidioma, smooth hymenophore, wood-rotting, widespread (America, Asia), sequence data unavailable, see Sjökvist et al. 2012 (phylogeny, stipitate stereoid fungi), Kirk et al. 2013 (genus accepted).

Infundibulicybe Harmaja 2003, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, 22 species, type species *I. geotropa* (Bull.) Harmaja, worldwide, some species edible (*I. gibba* (Pers.) Kumm and *I. catinus* (Fr.) Harmaja), see Dai et al. 2010b (Chinese edible mushrooms), sequence data available, new spp. see Vizzini et al. 2011d (Italy), Zhao et al. 2016e (China).

Ingoldiella D.E. Shaw 1972, Hydnaceae, Cantharellales, Agaricomycetes, sexual morph *Sistotrema* Fr. 1821, three species, type species *I. hamata* D.E. Shaw, Australia, some species with antibacterial activity (*I. hamata*), see Sridhar 2012, sequence data unavailable.

Ingoldiomyces Vánky 1996, Tilletiaceae, Tilletiales, Exobasidiomycetes, one species, type species *I. hyalosporus* (Massee) Vánky, plant parasite (leaves) on genera *Nassella*, *Piptochaetium* and *Stipa* (Poaceae), South America, North America, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Inocutis Fiasson & Niemelä 1984, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, nine species, type species *I. rheades* (Pers.) Fiasson & Niemelä, basidioma pielate, hymenophore poroid, wood-rotting, white rot, worldwide, see Ghobad-Nejhad and Kotiranta 2008 (Iran, key), Kirk et al. 2013 (genus accepted), sequence data available, see Brazee 2015 (Northen North America), new spp. see Valenzuela et al. 2013a (México).

Inocybe (Fr.) Fr. 1863, Inocybaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 1000 species, type species *I. relicina* (Fr.) Quél., ectomycorrhizal, worldwide, see Zhao et al. 2009 (toxic compounds), Lurie et al. 2009 (poisoning case overview), Kirk et al. 2013 (genus accepted), sequence data available, see Ryberg et al. 2008 (DNA barcoding, phylogeny), Larsson et al. 2009b (monograph, section *Rimosae*), Matheny et al. 2009 (biogeography), Cripps et al. 2010 (Rocky Mountains, subgenus *Mallocybe*), Ferrari 2010 (Europe, monograph, morphology, new sp.), Matheny and Bougher 2010 (Australia, type study), Petersen et al. 2010 (Crepidotaceae, phylogeny, taxonomy), Ryberg et al. 2010 (Inocybaceae, evolution, morphology, ecology), Ferrari et al. 2014 (Europe, monograph, morphology, new sp.), Larsson et al. 2014b (phylogeny,

morphology, new combination, epitype designation), Horak et al. 2015 (Thailand, Malaysia, monograph), Latha and Manimohan 2017 (India), Ludwig 2017 (Europe, monograph, new spp.), Matheny and Bougher 2017, 2018 (monograph, Australia, new spp., keys), Horak 2018 (monograph, New Zealand, new spp.), new spp. see Marchetti and Franchi 2008 (Italy), Esteve-Raventós and Moreno 2009 (Spain), Jacobsson and Larsson 2009 (Fennoscandia), Kobayashi 2009 (Japan), Kropp and Albee-Scott 2010 (Samoan Archipelago), Kropp et al. 2010 (North America, phylogeny), Kobayashi and Onishi 2010 (Japan), Esteve-Raventos et al. 2011 (Europe), Bidaud et al. 2012 (France), Bougher et al. 2012 (Australia), Kokkonen and Vauras 2012 (phylogeny, Finland), Vauras and Larsson 2012 (Finland, Sweden), Braaten et al. 2013 (Australia, USA), Corriol and Guinberteau 2013 (France), Fan and Bau 2013 (China), Kropp et al. 2013 (USA), Matheny et al. 2013 (USA), Crous et al. 2014a (Spain), Esteve-Raventós 2014 (Spain), Fan and Bau 2014a, b (China), Wartchow et al. 2014 (Brazil), Ariyawansa et al. 2015 (Fennoscandia), Esteve-Raventós et al. 2015 (Southern Europe), Latha and Manimohan 2015 (India), Bizio et al. 2016 (Croatia), Esteve-Raventós et al. 2016 (Spain), Franchi et al. 2016a, b (Italy), Jabeen et al. 2016 (Pakistan), Latha and Manimohan 2016a, b (India), Pradeep et al. 2016b (India), Vauras and Larsson 2016b (Fennoscandia, Estonia), Vauras and Larsson 2016a (Fennoscandia), Bandini et al. 2017 (Germany), Carteret and Reumaux 2017 (France), Crous et al. 2017a (Spain), Farooqi et al. 2017 (Pakistan), La Rosa et al. 2017 (Italy), Larsson et al. 2017, 2018a (Europe), Tibpromma et al. 2017 (India), Bandini et al. 2019 (Europe), Bau and Fan 2018 (China), Bizio and Castellan 2018 (Italy), Esteve-Raventós et al. 2018 (Europe, phylogeny, new spp.), Matheny and Swenie 2018 (North America, phylogeny, new spp.), Naseer et al. 2018 (Pakistan), Ullah et al. 2018 (Pakistan), Wartchow and Sá 2018 (Brazil).

Inonotopsis Parmasto 1973, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *I. subiculosa* (Peck) Parmasto, wood-rotting, widespread, sequence data available, see Dai 2010b (phylogeny, Hymenochaetaceae, China).

Inonotus P. Karst. 1879, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, c. 120 species, type species *I. hispidus* (Bull.) P. Karst., wood-rotting, widespread, some species can be medicinal use, Chaga mushroom (*I. obliquus*), see Youn et al. 2008, Chen et al. 2010 (anti-tumor activities), Balandaykin and Zmitrovich 2015 (medicinal properties), key see Ghobad-Nejhad and Kotiranta 2008 (Iran), Kirk et al. 2013 (genus accepted), sequence data available, see Tian et al. 2013 (*I. linteus* complex), Zhou et al. 2016e (*I. linteus* complex), new spp. see Baltazar and Gibertoni 2010 (new combination), Cui et al. 2011c (China), Ginns 2011b (North American), Abrahao and Gugliotta 2012 (Brazil), Zhou and Qin 2012a (China), Valenzuela et al. 2013a (morphology, Mexico), Tian et al. 2013 (China), Gomes-Silva et al. 2013 (Brazil), Zhou and Wang 2015 (China), Bian et al. 2016c (China).

Insolibasidium Oberw. & Bandoni 1984, Platygloeaceae, Platygloeales, Pucciniomycetes, one species, North America, Australia, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny et al. 2007b (DNA sequences).

Intextomyces J. Erikss. & Ryvarden 1976, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, four species, type species *I. contiguus* (P. Karst.) J. Erikss. & Ryvarden, worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Intrapes J.F. Hennen & Figueiredo 1979, *incertae sedis*, Pucciniales, Pucciniomycetes, one species, type species *I. paliformis* J.F. Hennen & Figueiredo, biotrophic on Chrysobalanaceae (*Couepia*), terrestrial, Brazil, sequence data unavailable, see Cummins and Hiratsuka 2003 (question whether or not it is a rust), Kirk et al. 2013 (genus accepted).

Ionosporus O. Khmelnitsky 2019, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *I. longipes* (Massee) O. Khmelnitsky, Davoodian, Raspé, S. Lee & Halling, stipitate-pileate, ectomycorrhizal with Dipterocarpaceae and Myrtaceae, Malaysia, Singapore, Australia, DNA sequence data available, see Khmelnitsky et al. 2019 (phylogeny, taxonomy).

Irpex Fr. 1825, Irpicaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. ten species, type species *I. lacteus* (Fr.) Fr., wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), biotechnological application, see Novotný et al. 2000, 2009 (review, biodegradation, *I. lacteus*), García-Torreiro et al. 2016 (bioethanol production, *I. lacteus*), sequence data available, see Miettinen et al. 2016a (phylogeny, Phanerochaetaceae), Yao et al. 2017 (genome, *I. lacteus*, China), new sp. see Lee et al. 2008b (morphology, South Korea).

Irpiciporus Murrill 1905, Cerrenaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *I. mollis* (Berk. & M.A. Curtis) Murrill [current name: *I. pachyodon* (Pers.) Kotl. & Pouzar], irpicoid basidioma, wood-rotting, white rot, widespread, Zmitrovich 2018a (taxonomy), sequence data available, see Floudas and Hibbett 2015 (phylogeny, *Phanerochaete*).

Irpicochaete Rick 1940, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *I. nodulosa* Rick, irpicoid basidioma, wood-rotting, Brazil, sequence data unavailable, see Kirk et al. 2008.

Irpicodon Pouzar 1966, Amylocorticiaceae, Amylocorticiales, Agaricomycetes, asexual morph unknown, one species, type species *I. pendulus* (Alb. & Schwein.) Pouzar, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Niemelä et al. 2007 (phylogeny).

Ischnoderma P. Karst. 1879, Ischodermataceae, Polyporales, Agaricomycetes, asexual morph unknown, ten species, type species *I. resinosum* (Schrad.) P. Karst., poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Justo et al. 2017 (phylogeny, Polyporales).

Itajahya Möller 1895, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, four species, type species *I. galericulata* Möller, worldwide (tropical, subtropical), see Kirk et al. 2013 (genus accepted), sequence data available, see Cabral et al. 2012 (reassessed), Marincowitz et al. 2015 (phylogeny).

Itersonilia Derx 1948, Mrakiaceae, Cystofilobasidiales, Tremellomycetes, sexual reproduction not observed, dikaryotic hyphae occasionally produced, asexual morphs, three species, type species *I. perplexans* Derx, plant parasite, yeast, widespread, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny), Kachalkin et al. 2019 (new spp.).

Jaapia Bres. 1911, Jaapiaceae, Jaapiales, Agaricomycetes, asexual morph unknown, two species, type species *J. argillacea* Bres., wood-saprobic, basidiomas corticioid, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2010 (phylogeny, new orders), Telleria et al. 2015 (monograph).

Jaculispora H.J. Huds. & Ingold 1960, Classiculaceae, Classiculales, Classiculomycetes, sexual morph unknown, one species, type species *J. submersa* H.J. Huds. & Ingold, presumably mycoparasitic, in aquatic habitats, Jamaica, sequence data available, see Aime et al. 2006 (phylogeny), Bauer et al. 2006 (phylogeny, simple-septate basidiomycetes), Aime et al. 2014 (phylogeny).

Jahnoporus Nuss 1980, Daryobolaceae, Polyporales, Agaricomycetes, asexual morph unknown, four species, type specie *J. hirtus* (Cooke) Nuss, on soil, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Spirin et al. 2015c (phylogeny, new spp.).

Jamesdicksonia Thirum., Pavgi & Payak 1961, Georgefischeriaceae, Georgefischeriales, Exobasidiomycetes, 20 species, type species *J. obesa* (Syd. & P. Syd.) Thirum., Pavgi & Payak, plant parasites (leaves, stems) on Cyperaceae and Poaceae, widespread, saprobic yeast states on plants, see Kirk et al. 2013 (genus accepted), cultures available, sequence data available, see Bauer et al. 2001b, Begerow et al. 2014 (taxonomy).

Jaminaea Sipiczki & Kajdacsi ex T. Kij. & Aime 2017, *incertae sedis*, Microstromatales, Exobasidiomycetes, four species, type species *J. angkorensis* Sipiczki & Kajdacsi ex Kijporn. & Aime, known only from saprobic states, plant material, widespread, cultures available, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (phylogenetic classification of yeasts, Ustilaginomycotina), Kijpornyongpan and Aime 2017 (validation), new spp. see Nasr et al. 2017 (Iran).

Janauaria Singer 1986, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *J. amazonica* Singer, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Japonogaster Kobayasi 1989, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *J. oohashianus* Kobayasi, Japan, a monstrosity of *Lycoperdon*, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Jianyunia Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, *incertae sedis*, Agaricostilbales, Agaricostilbomycetes, sexual morph unknown, one species, type species *J. sakaguchii* (Sugita, M. Takash., Hamam. & Nakase) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, plant material, Japan, cultures and sequence data available, see Wang et al. 2015e (taxonomy and phylogeny).

Jimtrappea T.W. Henkel & M.E. Sm. & Aime 2015, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *C. guyanensis* T.W. Henkel, M.E. Sm. & Aime, sequestrate, ectomycorrhizal, South America, sequence data available, see Smith et al. 2015 (phylogeny, taxonomy).

Joerstadia Gjaerum & Cummins 1982, Phragmidiaceae, Pucciniales, Pucciniomycetes, four species, type species *J. alchemillae* (Bacc.) Gjaerum & Cummins, asexual morph unknown, biotrophic on *Alchemilla* (Rosaceae), terrestrial, East Africa, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Jola Möller 1895, Eocronartiaceae, Platygloeales, Pucciniomycetes, one species, type species *J. hookeriarum* Möller, worldwide, sequence data available, see Henk and Vilgalys 2007 (phylogeny), Kirk et al. 2013 (genus accepted).

Johncouchia S. Hughes & Cavalc. 1983, Septobasidiaceae, Septobasidiales, Pucciniomycetes, one species, type species *J. mangiferae* (Bat.) S. Hughes & Cavalc., worldwide, see Kirk et al. 2013 (genus accepted).

Junghuhnia Corda 1842, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 35 species, type species *J. crustacea* (Jungh.) Ryvarden, poroid hymenophore, wood-rotting, white rot, cosmopolitan, see Kirk et al. 2013 (genus accepted), sequence data available, see Miettinen et al. 2012 (phylogeny), new spp. see Yuan and Dai 2008b, c (morphology, China), Ryvarden and Iturriaga 2010 (morphology, Venezuela), Yuan 2011

(morphology, tropical China), Yuan and Dai 2012 (morphology, China), Yuan et al. 2012 (morphology, China), Ryvarden 2018a (morphology, Tanzania), new combinations, see Ryvarden 2014 (morphology, tropical America), Ryvarden 2015d (morphology).

Kalmanozyma Q.M. Wang, F.Y. Bai, Begerow & Boekhout 2015, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, three species, type species *K. brasiliensis* (J.V.C. Oliveira, T.A. Borges, R.A.C. Santos, L.F.D. Freitas, C.A. Rosa, G.H. Goldman & D.M. Riano-Pachon) Q.M. Wang, F.Y. Bai, Begerow & Boekhout, known only from saprobic states, widespread, cultures available, sequence data available, see Wang et al. 2015c (taxonomy, phylogeny).

Kauffmania Örstadius & E. Larss. 2015, Psathyrellaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *K. larga* (Kauffman) Örstadius & E. Larss., Denmark, Finland, Germany, Iceland, Norway, Sweden, North America, sequence data available, see Örstadius et al. 2015 (taxonomy).

Kavinia Pilát 1938, Lentariaceae, Gomphales, Agaricomycetes, asexual morph unknown, four species, type species *K. sajanensis* (Pilát) Pilát, wood-decaying, southern India, Reunion Island in the pacific, Marie Galante Island in the Caribe, America, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2004 (phylogenetic), new spp. see Robledo and Urcelay 2017 (South America).

Kernella Thirum. 1949 (= *Kernia* Thirum. 1946), Pucciniaceae, Pucciniales, Pucciniomycetes, one species (& one variety), type species *K. lauricola* (Thirum.) Thirum., biotrophic on Lauraceae, terrestrial, China, India, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Kernkampella Rajendren 1970, Raveneliaceae, Pucciniales, Pucciniomycetes, eight species, type species *K. breyniae-patentis* (Mundk. & Thirum.) Rajendren, biotrophic on Euphorbiaceae, terrestrial, Costa Rica, Nigeria, China, India, Japan, sequence data available, see McTaggart et al. 2015 (phylogeny).

Kimuromyces Dianese, L.T.P. Santos, R.B. Medeiros & Furlan. 1995, Uropyxidaceae, Pucciniales, Pucciniomycetes, one species, type species *K. cerradensis* Dianese, L.T.P. Santos, R.B. Medeiros & Furlan., asexual morph *Calidion*-type, biotrophic on *Astronium* (Anacardiaceae), terrestrial, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Kjeldsenia W. Colgan, Castellano & Bougher 1995, Claustulaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *K. aureispora* W. Colgan, Castellano & Bougher, terrestrial, America, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006 (phylogeny gomphoid-phalloid fungi).

Kobayasia S. Imai & A. Kawam. 1958, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *K. nipponica* (Kobayasi) S. Imai & A. Kawam, terrestrial, Japan, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006 (phylogeny, gomphoid-phalloid fungi).

Kockovaella Nakase, I. Banno & Y. Yamada 1991, Cuniculitremaceae, Tremellales, Tremellomycetes, sexual morph unknown, 19 species, type species *K. thailandica* Nakase, I. Banno & Y. Yamada, yeast, widespread, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Kombocles Castellano, T.W. Henkel & Dentinger 2016, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *K. bakaiana* Castellano, T.W. Henkel & Dentinger, sequestrate, ectomycorrhizal, Africa, sequence data available, see Castellano et al. 2016 (taxonomy).

Kondoa Y. Yamada, Nakagawa & I. Banno 1989, Kondoacea, Agaricostilbales, Agaricostilbomycetes, sexual and asexual morphs known, ten species, type species *K. malvinella* (Fell & I.L. Hunter) Y. Yamada, Nakagawa & I. Banno, yeast, plant material, worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Wang et al. 2015d, e (taxonomy and phylogeny), new spp. see Liu et al. 2018d, Fotedar et al. 2019.

Kordyana Racib. 1900, Brachybasidiaceae, Exobasidiales, Exobasidiomycetes, eight species, type species *K. tradescantiae* (Pat.) Racib., plant parasites (leaves) on Commelinaceae, Southeast Asia, South America, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2002, 2014, Wang et al. 2015c (phylogenetic classification of yeasts, Pucciniomycotina).

Korupella Hjortstam & P. Roberts 2000, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, one species, type species *K. denticulata* P. Roberts & Hjortstam, Cameroon, sequence data unavailable, see Kirk et al. 2008.

Krasilnikovozyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Mrakiaceae, Cystofilobasidiales, Tremellomycetes, sexual and asexual morphs known, three species, type species *K. huempii* (C. Ramírez & A. E. González) X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, worldwide, cultures and sequence data available, see Liu et al. 2015b (taxonomy, phylogney), Kachalkin et al. 2019 (new spp.).

Kriegeria Bres. 1891 (= *Xenogloea* Syd. & P. Syd. 1919, = *Zymoxenogloea* D.J. McLaughlin & Doublés 1992), Kriegeriaceae, Kriegeriales, Microbotryomycetes, sexual and asexual morphs known, one species, type species *K. eriophori* Bres., yeast, plant parasite (Cyperaceae),

worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Toome et al. 2013, Wang et al. 2015e (taxonomy and phylogeny).

Krieglsteinera Pouzar 1987, Heterogastridiaceae, Heterogastridiales, Microbotryomycetes, one species, type species *K. lasiosphaeriae* Pouzar, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Kryptastrina Oberw. 1990, *incertae sedis*, *incertae sedis*, Pucciniomycotina, asexual morph unknown, one species, type species *K. inclusa* Oberw., Colombia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Kuehneola Magnus 1898 (= *Spirechina* Arthur 1907), Phragmidiaceae, Pucciniales, Pucciniomycetes, 22 species, type species *K. albida* (J.G. Kühn) Magnus, asexual morph, biotrophic on Anacardiaceae, Celastraceae, Malvaceae, Rosaceae, Verbenaceae, Vitaceae, terrestrial, widespread, new spp. see Ono 2013a, 2015a.

Kuntzeomyces Henn. ex Sacc. & P. Syd. 1899, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, two species, type species *K. ustilaginoideus* (Henn.) Sacc., parasite (flowers) on *Rhynchospora* spp. (Cyperaceae), South America, cultures unavailable, sequence data unavailable, see Kirk et al. 2013 (genus accepted), Begerow et al. 2014 (taxonomy).

Kurtia Karasiński 2014, *incertae sedis*, Hymenochaetales, Agaricomycetes, asexual morph unknown, three species, type species *K. argillacea* (Bres.) Karasiński, ericoid mycorrhizal fungus, temperate, boreal forests of Europe, Asia and Northern America, sequence data available, see Kolařík and Vohník 2018 (phylogeny, monograph).

Kurtzmanomyces Y. Yamada, Itoh, H. Kawas., I. Banno & Nakase 1989, Chionosphaeraceae, Agaricostilbales, Agaricostilbomycetes, sexual morph unknown, four species, type species *K. nectairei* (Rodr. Mir.) Y. Yamada, Itoh, H. Kawas., I. Banno & Nakase, yeast, worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Wang et al. 2015d, e (taxonomy and phylogeny).

Kusaghiporia J. Hussein, S. Tibell & Tibuhwa 2018, Laetiporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *K. usambarensis* J. Hussein, S. Tibell & Tibuhwa, wood-rotting, brown rot, Tanzania, sequence data available, see Hussein et al. 2018 (phylogeny, taxonomy).

Kweilingia Teng 1940 (= *Dasturella* Mundk. & Khesw. 1943, *Tunicopsora* Suj. Singh & P.C. Pandey 1971), Phakopsoraceae, Pucciniales, Pucciniomycetes, four species, type species *K. bambusae* (Teng) Teng, asexual morph, biotrophic on Poaceae, Costaceae, terrestrial, circumglobal in tropics, sequence data available, see Aime et al. 2018a (evolution, phylogeny).

Kwoniella Statzell-Tallman & Fell 2008, Cryptococcaceae, Tremellales, Tremellomycetes, sexual and asexual morphs known, 14 species, type species *K. mangroviensis* Statzell-Tallman, Belloch & Fell, yeast, plant material, worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (emendation, taxonomy and phylogeny), Kachalkin et al. 2019 (phylogeny and new spp.)

Laccaria Berk. & Broome 1883, Hydnangiaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 85 species, type species *L. laccata* (Scop.) Cooke, worldwide, ectomycorrhizal, some species edible (*L. amethystina* Cooke), see Dai et al. 2010b (Chinese edible mushrooms), Kirk et al. 2013 (genus accepted), Melgar et al. 2014 (edible mushrooms), Sheedy et al. 2015 (population genetic structure), sequence data available, see Martin et al. 2008 (genome), Sheedy et al. 2013 (Australia, phylogeny), Wilson et al. 2017 (evolution), new spp. see Wilson et al. 2013 (China), Popa et al. 2014, 2016 (China, Panama), Montoya et al. 2015 (Mexico), Luo et al. 2016 (China), Cho et al. 2018 (South Korea).

Laccariopsis Vizzini 2013, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *L. mediterraneus* (Pacioni & Lalli) Vizzini, worldwide, terrestrial, gregarious, sequence data available, see Vizzini et al. 2013a (taxonomy).

Laccocephalum McAlpine & Tepper 1895, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *L. basilapidoides* McAlpine & Tepper, stipitate basidioma, poroid hymenophore, terrestrial, brown rot, sclerotium-forming, some species edible, medicinal use, see Zhou et al. 2010 (anthelmintic activity, *L. mylittae* (Cooke & Massee) Núñez & Ryvarden), Australia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Lachnella Fr. 1836, Niaceae, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *L. alboviolascens* (Alb. & Schwein.) Fr., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Bodensteiner et al. 2004 (phylogeny, cyphelloid homobasidiomycetes), Matheny et al. 2006 (phylogeny), Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure).

Lachnocladium Lév. 1846, Peniophoraceae, Russulales, Agaricomycetes, asexual morph unknown, c. 40 species, type species *L. brasiliense* (Lév.) Pat., worldwide, wood-decaying, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Larsson 2003 (phylogeny).

Lacrymaria Pat. 1887, Psathyrellaceae, Agaricales, Agaricomycetes, asexual morph unknown, 14 species, type species *L. lacrymabunda* (Bull.) Pat., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Walther et al. 2005 (phylogeny), Matheny et al. 2006 (phylogeny), Larsson and Örstadius 2008 (phylogeny),

Padamsee et al. 2008 (phylogeny), Nagy et al. 2009, 2010b (phylogeny), Dentinger et al. 2011 (DNA barcode).

Lactarius Pers. 1797, Russulaceae, Russulales, Agaricomycetes, asexual morph unknown, agaricoid to secotioid-gasteroid, c. 450 species accepted, c. 1000 species estimated, conserved type species *L. torminosus* (Schaeff.) Pers., three large subgenera, ectomycorrhizal, worldwide but with main distribution in boreal and temperate regions, some poisonous, also some commercially important edible species (Wang 2000; Wang and Liu 2002; Wang et al. 2015h), sequence data available, see Eberhardt and Verbeken 2004, Nuytinck and Verbeken 2007, Nuytinck et al. 2007, Geml et al. 2009, He et al. 2011a, Stubbe and Verbeken 2012, Verbeken et al. 2014, Wisitrassameewong et al. 2016, Vidal et al. 2019 (phylogeny), new spp. see Montoya et al. 2012a (Neotropics), Stubbe et al. 2012b (Australia), Verbeken et al. 2014 (Asia), Nuytinck and Ammirati 2014 (North America), Lee et al. 2015 (South Korea), Liu et al. 2015a (Asia), Wisitrassameewong et al. 2014a, b, 2015, 2016 (Asia), Wang et al. 2015h (Asia), Wang 2016, 2017, 2018 (Asia), Buyck et al. 2017 (Asia), Das et al. 2017c (Asia), Nuytinck et al. 2017 (North America), Shi et al. 2018 (Asia), Wang et al. 2018c, 2018e (Asia), Lee et al. 2019 (Asia), Uniyal et al. 2018 (Asia), Paloi and Acharya 2019 (Asia), other literature see Heilmann-Clausen et al. 1998 (Europe), Basso 1999 (Europe), Verbeken et al. 2018 (Europe), Buyck et al. 2008a (phylogeny), Geml et al. 2009 (Alaska, boreal and arctic spp.), Buyck et al. 2010 (nomenclature), Verbeken and Walleyn 2010 (Africa, monograph), Nuytinck et al. 2010 (Europe and North America), Verbeken et al. 2010 (Australasia), Rochet et al. 2011 (Europe), Geml et al. 2012b (Arctic, phylogeny, biogeography), Stubbe and Verbeken 2012 (taxonomy), Garay-Serrano et al. 2012 (Neotropics), Verbeken and Nuytinck 2013 (taxonomy), Lee et al. 2018 (Asia, new records), Looney et al. 2018 (genomes), Li et al. 2019c (mitochondrial genomes).

Lactifluus (Pers.) Roussel 1806 (= *Pleurogala* Redhead & Norvell 1993), Russulaceae, Russulales, Agaricomycetes, asexual morph unknown, 207 species accepted, 530 species estimated, type species *L. volemus* (Fr.:Fr.) Kuntze, four subgenera, 19 sections (De Crop et al. 2017), agaricoid, some pleurotoid, ectomycorrhizal with angiosperms and gymnosperms, worldwide (main distribution in the tropics), some species edible, commercially important edible species see Boa 2004, Lincoff 2010, Sharp 2011, 2014, Njouonkou et al. 2016, sequence data available, see Buyck et al. 2008, De Crop et al. 2017 (multigene phylogenies), new spp. see Van de Putte et al. 2009 (Afrotropics), Van de Putte et al. 2010 (Aisa), Wang et al. 2012, 2015 (Asia), De Crop et al. 2012, 2016 (Afrotropics), Miller et al. 2012 (America), Van de Putte et al. 2012 (Asia), Stubbe et al. 2012a (Asia), Morozova et al. 2013 (Asia), Sá et al. 2013, Sá and Wartchow 2013 (America), Wartchow et al. 2013 (Neotropics), Maba et al. 2014, 2015a, b (West Africa), Verbeken et al. 2014 (Asia), Latha et al. 2016c (Asia), Li et al. 2016b (Asia), Uniyal et al. 2016 (Asia),Van de Putte et al. 2016 (Western Palearctic), Zhang et al. 2016 (Asia), Delgat et al. 2017 (Afrotropics), Song et al. 2017, 2018d (Asia), Das et al. 2017d (Asia), Hyde et al. 2017b (Asia), Crous et al. 2017b (Neotropics), De Lange et al. 2018 (Afrotropics), De Crop et al. 2018 (Asia, pleurotoid), Liu et al. 2018 (Asia), De Crop et al. 2019 (Afrotropics), Dierickx et al. 2019 (Asia and Australasia), Phookamsak et al. 2019 (Asia), other literature see Buyck et al. 2010 (nomenclature), Verbeken and Walleyn 2010 (Afrotropics, monograph), Verbeken et al. 2011, 2012 (recombinations), Stubbe et al. 2012a (recombinations), Verbeken and Nuytinck 2013 (taxonomy), De Crop et al. 2014 (phylogeny), Lee et al. 2018 (Asia, new records).

Lactocollybia Singer 1939, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, 20 species, type species *L. lacrimosa* (R. Heim) Singer, Saprobic, worldwide, see Kirk et al. (genus accepted), sequence data available, new spp. see Hosen et al. 2016a (China).

Laeticutis Audet 2010, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *L. cristata* (Schaeff.) Audet, wood-decaying, Europe, sequence data available, see Audet 2010 (taxonomy).

Laetifomes T. Hatt. 2001, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *L. flammans* (Corner) T. Hatt., perennial basidioma, poroid hymenophore, wood-rotting, Solomon Islands, sequence data unavailable, see Kirk et al. 2008.

Laetiporus Murrill 1904, Laetiporaceae, Polyporales, Agaricomycetes, asexual morph unknown, 15 species, type species *L. speciosus* Battarra ex Murrill [current name: *L. sulphureus* (Bull.) Murrill], poroid hymenophore, wood-rotting, brown rot, widespread, see Kirk et al. 2013 (genus accepted), some species edible, medicinal use, see Grienke et al. 2014 (review, *L. sulphureus*), sequence data available, see Nagy et al. 2015 (genome, *L. sulphureus*), Song and Cui 2017 (phylogeny, historical biogeography), new spp. see Tomsovský and Jankovský 2008 (phylogeny, Europe), Ota et al. 2009 (phylogeny, Japan), Banik et al. 2012 (phylogeny, Caribean basin), Song et al. 2014b (phylogeny, China), Pires et al. 2016 (phylogeny, Brazil), Song et al. 2018b (phylogeny, China).

Laetisaria Burds. 1979, (= *Limonomyces* Stalpers & Loer. 1982), Corticiaceae, Corticiales, Agaricomycetes, asexual morph known (bulbil-forming), seven species, type species *L. fuciformis* (Berk.) Burds., grass parasite, lichenicolous, or lignicolous, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Diederich et al. 2011 (Luxembourg), Diederich et al. 2018a (phylogeny).

Lagarobasidium Jülich 1974, Schizoporaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, five species, type species *L. pruinosum* (Bres.) Jülich, wood-rotting and lichenicolous, Europe, sequence data available, new spp. see Dueñas et al. 2009 (Azores Islands).

Lamelloclavaria Birkebak & Adamčík 2016, Clavariaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *L. petersenii* Adamčík & Birkebak, Finland, sequence data available, see Birkebak et al. 2016 (Clavariaceae, phylogeny, taxonomy).

Lamelloporus Ryvarden 1987, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *L. americanus* Ryvarden, hymenophore concentrically lamellate, wood-rotting, neotropical, see Salvador-Montoya et al. 2012 (morphology, distribution, new record, Peru), Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Miettinen et al. 2012 (phylogeny).

Langdonia McTaggart & R.G. Shivas 2012, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, eight species, type species *L. fraseriana* (Syd.) McTaggart & R.G. Shivas, parasite (ovaries) on *Aristida* and *Stipagrostis* (Poaceae), Australia, Bolivia, Thailand, saprobic yeast states on plants, cultures available, sequence data available, see Wang et al. 2015c (taxonomy, phylogeny).

Lanmaoa G. Wu, Zhu L. Yang & Halling 2015, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, seven species, type species *L. asiatica* G. Wu & Zhu L. Yang, stipitate-pileate, ectomycorrhizal, North America, Asia, Central America, some species edible (*L. asiatica* G. Wu & Zhu L. Yang), sequence data available, see Wu et al. 2016e, f (new genus, Boletaceae, phylogeny), new sp. see Chai et al. 2018 (China).

Laricifomes Kotl. & Pouzar 1957, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *L. officinalis* (Vill.) Kotl. & Pouzar, perennial basidioma, poroid hymenophore, wood-rotting, brown rot, widespread (North America, Eurasia), ethnomycological use, see Blanchette et al. 1992 (spirit figures, North America), medicinal use, see Grienke et al. 2014 (review), sequence data available, see Han et al. 2016a (phylogeny, *Fomitopsis s. l.*).

Larssoniporia Y.C. Dai, Jia J. Chen & B.K. Cui 2015, Echinodontiaceae, Russulales, Agaricomycetes, asexual morph unknown, two species, type species *L. tropicalis* (Cooke) Y.C. Dai, Jia J. Chen & B.K. Cui, wood-decaying, Asia, sequence data available, see Chen et al. 2016b (phylogeny).

Laternea Turpin 1822, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, two species, type species *L. triscapa* Turpin, America, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006 (phylogeny, gomphoid-phalloid fungi).

Laurilia Pouzar 1959, Bondarzewiaceae, Russulales, Agaricomycetes, asexual morph unknown, two species, type species *L. sulcata* (Burt) Pouzar, wood-decaying, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Larsson 2003 (phylogeny).

Lauriliella Nakasone & S.H. He 2017, Bondarzewiaceae, Russulales, Agaricomycetes, asexual morph unknown, two species, type species *L. taxodii* (Lentz & H.H. McKay) S.H. He & Nakasone, wood-rotting, associated with white stringy rot to brown powdery rot in pockets, often associated with living trees of Cupressaceae, sequence data available, see Liu et al. 2017e (phylogeny, *Echinodontium*).

Laurobasidium Jülich 1982, Laurobasidiaceae, Exobasidiales, Exobasidiomycetes, two species, plant parasites (stem, trunk) on *Laurus* and *Cinnamomum* (Lauraceae), Canary Islands, Madeira and Thailand, cultures unavailable, see Kirk et al. 2013 (genus accepted), sequence data available, see Begerow et al. 2002, 2014 (taxonomy), Wang et al. 2015c (taxonomy, phylogeny), Kakishima et al. 2017a (new combination), Somrithipol et al. 2018 (phylogeny, new family).

Lawreymyces Lücking & Moncada 2017, Corticiaceae, Corticiales, Agaricomycetes, asexual morph unknown, seven species, type species *L. palicei* Lücking & Moncada, lichenicolous, occurring on lichens of the family Verrucariaceae, known specifically from the genera *Agonimia* and *Normandina*, sequence data available, see Lücking and Moncada 2017 (taxonomy, voucherless fungi, phylogeny).

Lawrynomyces Karasiński 2013, *incertae sedis*, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *L. capitatus* (J. Eriksson & Å. Strid) Karasiński, is introduced to accommodate *Hyphoderma capitatum*, wood-rotting, growing on decayed coniferous wood, Europe, see Karasinski 2013 (taxonomy), sequence data unavailable.

Laxitextum Lentz 1956, Hericiaceae, Russulales, Agaricomycetes, asexual morph unknown, three species, type species *L. bicolor* (Pers.) Lentz, wood-decaying, worldwide, see Kirk et al. 2013 (genus accepted), Mudalungu et al. 2016 (natural products), sequence data available, see Larsson and Hallenberg 2001 (*Gloeocystidiellum porosum-clavuligerum* complex), Larsson et al. 2004 (phylogeny, corticioid homobasidiomycetes).

Lecanocybe Desjardin & E. Horak 1999, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *L. lateralis* Desjardin & E. Horak, on senescent leaves of yellow ginger or banana, Java, Hawaii, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Leccinellum Bresinsky & Manfr. Binder 2003, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, 17 species, type species *L. nigrescens* (Singer) Bresinsky & Manfr. Binder, stipitate-pileate, ectomycorrhizal, worldwide (north temperate, except Australia), sequence data available, see Nuhn et al. 2013 (phylogeny, Boletineae), new spp. see Kuo et al. 2013 (North America), Li et al. 2016a (China), Wu et al. 2016f (China).

Leccinum Gray 1821, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 130 species, type species *L. aurantiacum* (Bull.) Gray, stipitate-pileate, ectomycorrhizal, worldwide, some species edible, see Boa 2004 (edible mushrooms), Kirk et al. 2013 (genus accepted), Bessette et al. 2017 (Eastern North America), sequence data available, new spp. see Li et al. 2016b (India), new combinations see Horak 2011.

Leifiporia Y.C. Dai, F. Wu & C.L. Zhao 2016, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *L. rhizomorpha* Y.C. Dai, F. Wu & C.L. Zhao, wood-rotting, sequence data available, see Zhao et al. 2016a (new genus, new species, new combinations), Zmitrovich 2018a (taxonomy).

Lentaria Corner 1950, Lentariaceae, Gomphales, Agaricomycetes, asexual morph unknown, 19 species, type species *L. surculus* (Berk.) Corner, lignicolous, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Garnica et al. 2007, new spp. see Liu et al. 2017d (China, monograph, key).

Lentinellus P. Karst. 1879, Auriscalpiaceae, Russulales, Agaricomycetes, asexual morph unknown, c. 30 species, type species *L. cochleatus* (Pers.) P. Karst., wood-decaying, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Larsson 2003 (phylogeny), new spp. see Liu and Bau 2011a, 2011b (Chinese records).

Lentinula Earle 1909, Omphalotaceae, Agaricales, Agaricomycetes, asexual morph unknown, eight species, type species *L. boryana* (Berk. & Mont.) Pegler, worldwide, wood-decaying, some species edible, shiitake mushroom (*L. edodes* (Berk.) Pegler), see Dai et al. 2010b (Chinese edible mushrooms), Zmitrovich 2010, Zmitrovich and Kovalenko 2016 (medicinal, phylogeny), Sanuma et al. 2016 (edible mushrooms, Brazil), Kirk et al. 2013 (genus accepted), sequence data available, see Capelari et al. 2010a (Brazil), Grand et al. 2011 (phylogeny), Avin et al. 2012 (phylogeny, edible mushrooms), Sharma et al. 2015 (India, monograph), Chen et al. 2016f (genome), Xiang et al. 2016 (China, population genetic diversity), Yang et al. 2017a (mitochondrial genome).

Lentinus Fr. 1825, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, 55 species, type species *L. crinitus* (L.) Fr., stipitate basidioma, lamellate or poroid hymenophore, wood-rotting, white rot, widespread (esp. subtropical), some species edible (*L. cyathiformis* (Schaeff.) Bres.), see Dai et al. 2010b (edible mushrooms, China), Sanuma et al. 2016 (edible mushrooms, Brazil), some species medicinal use (*L. lepideus* (Fr.) Fr.), see Dai and Yang 2008 (medicinal mushrooms, China), Bisen et al. 2010 (pharmacological activities), Kirk et al. 2013 (genus accepted), sequence data available, see Krüger et al. 2008 (‘*Polyporellus*’ group, phylogeny), Grand et al. 2011 (phylogeny), Seelan et al. 2015 (phylogeny), Sharma et al. 2015 (India, phylogeny), Zmitrovich and Kovalenko 2016 (phylogeny), new spp. see Zmitrovich 2010 (new combination), Karunarathna et al. 2012 (Thailand), Senthilarasu and Singh 2013b (India), Njouonkou et al. 2013 (Africa), new combinations, see Zmitrovich 2010 (nomenclature), Zmitrovich and Kovalenko 2016 (phylogeny).

Lentoporia Audet 2017, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *L. carbonica* (Overh.) Audet, wood-rotting, sequence data available, see Ortiz-Santana et al. 2013 (phylogeny).

Lenzitopsis Malençon & Bertault 1963, Thelephoraceae, Thelephorales, Agaricomycetes, asexual morph unknown, two species, type species *L. oxycedri* Malençon & Bertault, worldwide, wood decaying, see Kirk et al. 2013 (genus accepted), sequence data available, see Zhou and Kõljalg 2013 (phylogeny, new sp.).

Lepidomyces Jülich, 1979, Pterulaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *L. subcalceus* (Litsch.) Jülich, sequence data unavailable, see Larsson 2007b (taxonomy).

Lepidostroma Mägd. & S. Winkl. 1967, Lepidostromataceae, Lepidostromatales, Agaricomycetes, asexual morph unknown, four species, type species *L. terricolens* Mägd. & S. Winkl. [current name: *L. calocerum* (G.W.Martin) Oberw.], tropics of Africa and the Americas, lichenized, see Kirk et al. 2013 (genus accepted), sequence data available, see Hodkinson et al. 2012, 2014 (new order, new spp., phylogeny), Liu et al. 2017a (phylogeny).

Lepiota (Pers.) Gray 1821 (= *Amogaster* Castellano 1995 *fide* Ge and Smith 2013; = *Cryptolepiota* Kropp & Trappe 2012; = *Cribrospora* Pacioni & P. Fantini 2000 *fide* Vidal et al. 2015), Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 450 species, type species *L. clypeolaria* (Bull.) P. Kumm., agaricoid, sequestrate, worldwide, terrestrial and saprotrophic, see Kirk et al. 2013 (genus accepted), sequence data available, Liang et al. 2009 (*L. cristata*), Sysouphanthong et al. 2011, 2012, 2013a (East Asia), Lebel and Vellinga 2013 (Australia, sequestrate taxa), Vidal et al. 2015 (Europe, sequestrate taxa), Liang 2016 (China, phylogeny), new spp. see Arun Kumar and Manimohan 2009b (India), Vellinga 2010a (USA), Liang and Yang 2011 (China), Vidal et al. 2015 (Europe, sequestrate spp.), Liang et al. 2012 (China),

Liang and Yang 2013 (China), Kumari et al. 2013c (India), Vizzini et al. 2014 (Italy), Caballero et al. 2015 (Spain), Justo et al. 2015a (Dominican Republic), Qasim et al. 2015a, 2016 (Pakistan).

Lepista (Fr.) W.G. Sm. 1870, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. 50 species, type species *L. panaeola* (Fr.) P. Karst., worldwide, some species edible, wood blewit (*L. nuda* (Bull.) Cooke), see Hall et al. 2003 (edible mushrooms), Dai et al. 2010b (Chinese edible mushrooms), Kirk et al. 2013 (genus accepted), sequence data available, see Stott et al. 2005 (phylogeny), Alvarado et al. 2015 (phylogeny), Thongbai et al. 2017b (Thailand, cultivation).

Lepistella T.J. Baroni & Ovrebo 2007, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *L. ocula* T.J. Baroni & Ovrebo, Costa Rica, sequence data unavailable, see Ovrebo and Baroni 2007 (taxonomy).

Leptocorticium Hjortstam & Ryvarden 2002, *incertae sedis*, Corticiales, Agaricomycetes, asexual morph unknown, eight species, type species *L. cyatheae* (S. Ito & S. Imai) Hjortstam & Ryvarden, sequence data available for *L. tenellum* only, new spp. see Gorjón and Saitta 2014 (Italy), Sanyal and Dhingra 2015 (India), Li et al. 2016b (sequence data).

Leptoporus Quél. 1886, Irpicaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *L. mollis* (Pers.) Quél., basidioma resupinate to pileate, hymenophore poroid, wood-rotting, brown rot, widespread (north temperate), see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Justo et al. 2017 (phylogeny, Polyporales).

Leptosporomyces Jülich 1972, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, 15 species, type species *L. galzinii* (Bourdot) Jülich, widespread (north temperate), see Zmitrovich 2008 (species manual), Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2010 (phylogeny).

Leratiomyces Bresinsky & Manfr. Binder ex Bridge, Spooner, Beever & D.C. Park 2008, Strophariaceae, Agaricales, Agaricomycetes, asexual morph unknown, 13 species, type species *L. similis* (Pat. ex Sacc. & Trotter) Bresinsky & Manfr. Binder ex Redhead & McNeill, sequence data available, see Bridge et al. 2008 (new combination, monograph), Borovička et al. 2015 (phylogeny).

Leucoagaricus Locq. ex Singer 1948 (= *Sericeomyces* Heinem. 1978), Agaricaceae, Agaricales, Agaricomycetes, asexual morph *Attamyces* Kreisel 1972, c. 135 species, type species *L. rubrotinctus* (Peck) Singer, agaricoid, terrestrial and saprotrophic, worldwide, see Kirk et al. 2013 (genus accepted), Cabrera 2015 (Brazil), sequence data available, Vellinga 2010b (California, USA, section *Piloselli*), new spp. see Arun Kumar and Manimohan 2009a (India), Liang et al. 2010 (China), Muñoz et al. 2012 (Spain), Malysheva et al. 2013 (Russia), Yuan et al. 2014 (South China), Ge et al. 2015b (Asia), Justo et al. 2015b (Dominican Republic), Qasim et al. 2015b (Pakistan), Yu et al. 2016 (China), Dovana et al. 2017 (Italy), Hussain et al. 2018a (Pakistan), new combinations, see Ruiz and Molinari-Novoa 2016 (anamorphic Agaricaceae, nomenclature), Yang and Ge 2017 (China), Hussain et al. 2018c (Pakistan), Sysouphanthong et al 2018 (Laos)

Leucocalocybe X.D. Yu & Y.J. Yao 2011, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *L. mongolica* X.D. Yu & Y.J. Yao, China, Mongolia, saprotrophic, edible, sequence data available, see Yu et al. 2011 (taxonomy).

Leucocintractia M. Piepenbr., Begerow & Oberw. 1999, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, four species, type species *L. scleriae* (DC.) M. Piepenbr., Begerow & Oberw., plant parasites (pedunculi of inflorescence, internodes) of *Rhynchospora* (Cyperaceae), Africa, North America, South America, South Asia, West Indies, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Piepenbring et al. 1999, Begerow et al. 2014, Wang et al. 2015c (phylogeny).

Leucocoprinus Pat. 1888, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 50 species, type species *L. cepistipes* (Sowerby) Pat., worldwide, terrestrial, saprotrophic, see Birkebak 2010 (USA), Kirk et al. 2013 (genus accepted), sequence data available, see Arun Kumar and Manimohan 2009a (India), Vellinga et al. 2011 (phylogeny).

Leucocortinarius (J.E. Lange) Singer 1945, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *L. bulbiger* (Alb. & Schwein.) Singer, ectomycorrhizal, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure).

Leucocybe Vizzini, P. Alvarado, G. Moreno & Consiglio 2015, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, tree species, type species *L. candicans* (Pers.) Vizzini, P. Alvarado, G. Moreno & Consiglio, Europe, North America, sequence data available, see Alvarado et al. 2015 (taxonomy), Das et al. 2017d (new combination).

Leucogaster R. Hesse 1882, Albatrellaceae, Russulales, Agaricomycetes, asexual morph unknown, c. 20 species, type species *L. liosporus* R. Hesse, terrestrial, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Osmundson et al. 2013 (DNA barcoding).

Leucogyrophana Pouzar 1958, Hygrophoropsidaceae, Boletales, Agaricomycetes, asexual morph unknown, 13 species, type species *L. mollusca* (Fr.) Pouzar, widespread, see Kirk et al. 2013 (genus accepted), sequence data

available, see Larsson 2007a (phylogeny, corticioid fungi), Binder et al. 2010 (phylogeny).

Leucoinocybe Singer ex Antonín, Borovička, Holec & Kolařík 2019, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *L. lenta* (Maire) Antonín, Borovička, Holec & Kolařík, Europe, sequence data available, see Antonín et al. 2019 (taxonomy, phylogeny).

Leucopaxillus Boursier 1925, Tricholomataceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 16 species, type species *L. paradoxus* (Costantin & L.M. Dufour) Boursier, temperate, subtropical, some species edible, giant clitocybe (*L. giganteus* (Sowerby) Singer), see Hall et al. 2003 (edible mushrooms), Ren et al. 2008 (medical use), Dai et al. 2010b (Chinese edible mushrooms), Kirk et al. 2013 (genus accepted), sequence data available, see Vizzini et al. 2012b (phylogeny), Osmundson et al. 2013 (DNA barcode), Sánchez-García et al. 2014 (phylogeny), Sánchez-García and Matheny 2017 (evolution), new spp., see Buda et al. 2012 (Sicilia).

Leucophellinus Bondartsev & Singer 1944, Schizoporaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *L. irpicoides* (Bondartsev ex Pilát) Bondartsev & Singer, wood-rotting, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Wu et al. 2017a (phylogeny).

Leucophleps Harkn. 1899, Albatrellaceae, Russulales, Agaricomycetes, asexual morph unknown, three species, type species *L. magnata* Harkn., terrestrial, North America, see Kirk et al. 2013 (genus accepted), sequence data available, see Albee-Scott 2007 (phylogeny).

Leucopholiota (Romagn.) O.K. Mill., T.J. Volk & Bessette 1996, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *L. decorosa* (Peck) O.K. Mill., T.J. Volk & Bessette, USA, see Kirk et al. 2013 (genus accepted), sequence data available see Vellinga 2004 (phylogeny), Harmaja 2013 (new combination, synonymization of *Amylolepiota* Harmaja).

Leucosporidium Fell, Statzell, I.L. Hunter & Phaff 1970, Leucosporidiaceae, Leucosporidiales, Microbotryomycetes, sexual and asexual morphs known, eleven species, type species *L. scottii* Fell, Statzell, I.L. Hunter & Phaff, yeast, psychrophilic, worldwide, Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Sampaio et al. 2003, Wang et al. 2015e (taxonomy, phylogeny).

Leucotelium Tranzschel 1935, Uropyxidaceae, Pucciniales, Pucciniomycetes, three species, type species *L. cerasi* (Bérenger) Tranzschel, Eurasia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Libkindia Mašínová, A. Pontes, J.P. Samp. & Baldrian 2017, *incertae sedis*, *incertae sedis*, Microbotryomycetes, sexual morph unknown, one species, type species *L. masarykiana* Mašínová, A. Pontes, J.P. Samp. & Baldrian, yeast, isolated from temperate forest soils, Europe, cultures and sequence data available, see Mašínová et al. 2017 (new genus, new spp.).

Lichenomphalia Redhead, Lutzoni, Moncalvo & Vilgalys 2002, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, 14 species, type species *L. hudsoniana* (H.S. Jenn.) Redhead, Lutzoni, Moncalvo & Vilgalys, arctic-alpine, lichenised, sequence data available, see Geml et al. 2012a (biogeography), new spp. see Barrasa et al. 2009 (new combination), Kantvilas and Jarman 2012 (Tasmania), Sandoval-Leiva et al. 2017 (Chilean Altiplano), Shiryaev et al. 2018 (biogeography).

Licrostroma P.A. Lemke 1964, Peniophoraceae, Russulales, Agaricomycetes, asexual morph known, one species, type species *L. subgiganteum* (Berk.) P.A. Lemke, wood-rotting, sequence data available, see Giraldo et al. 2017 (taxonomy).

Ligiella J.A. Sáenz 1980, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *L. rodrigueziana* J.A. Sáenz, Costa Rica, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Lignomphalia Antonín, Borovička, Holec & Kolařík 2019, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *L. lignicola* (Lj.N. Vassiljeva) Antonín, Borovička, Holec & Kolařík, Europe, sequence data available, see Antonín et al. 2019 (taxonomy, phylogeny).

Lignomyces R.H. Petersen & Zmitr. 2015, Pleurotaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *L. vetlinianus* (Domański) R.H. Petersen & Zmitr., Russia, basidioma pleurotoid, sequence data available, see Petersen et al. 2015 (taxonomy, *Resupinatus*-clade).

Lignosus Lloyd ex Torrend 1920, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, eight species, type species *L. sacer* (Afzel. ex Fr.) Torrend, stipitate basidioma, terrestrial, widespread (paleotropical), see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), some species medicinal use, see Nallathamby et al. 2018 (bioactive activities, *L. rhinocerus* (Cooke) Ryvarden), sequence data available, see Cui et al. 2011a (phylogeny, new sp., China), Yap et al. 2014 (genome, *L. rhinocerus*), new spp. see Tan et al. 2013 (phylogeny, Malaysia).

Lilaceophlebia (Parmasto) Spirin & Zmitr. 2004, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *L. livida* (Pers.) Spirin & Zmitr., resupinate phlebioid basidioma, wood-inhabiting, white rot, widespread, sequence data available, see Ghobad-Nejhad and Hallenberg 2012 (phylogeny), Justo et al. 2017 (phylogeny, Polyporales).

Limacella Earle 1909, Amanitaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 15 species, type species *L. delicata* (Fr.) H.V. Sm., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Zhang et al. 2004 (Eastern Asian), Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Cui et al. 2018 (phylogeny), new spp. see Kumari et al. 2013c (India).

Limacellopsis Zhu L. Yang, Q. Cai & Y.Y. Cui 2018, Amanitaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *L. guttata* (Pers.)Zhu. L. Yang, Q. Cai & Y.Y. Cui, Europe, China, see Cui et al. 2018 (phylogeny), Yang et al. 2018b (genus accepted).

Limnoperdon G.A. Escobar 1976, Limnoperdaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *L. incarnatum* G.A. Escobar, USA, Japan, South America, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2006 (phylogeny).

Lindtneria Pilát 1938, Stephanosporaceae, Agaricales, Agaricomycetes, asexual morph unknown, ten species, type species *L. trachyspora* (Bourdot & Galzin) Pilát, worldwide, sequence data available, new spp. see Liu et al. 2016a (China).

Lipocystis Cummins 1937, Raveneliaceae, Pucciniales, Pucciniomycetes, one species, type species *L. caesalpiniae* (Arthur) Cummins, biotrophic on Oleaceae (*Fraxinus*), terrestrial, Russia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Litschauerella Oberw. 1965, Hydnodontaceae, Trechisporales, Agaricomycetes, asexual morph unknown, three species, type species *L. abietis* (Bourdot & Galzin) Oberw. ex Jülich, wood-decaying, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Lobulicium K.H. Larss. & Hjortstam 1982, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, one species, type species *L. occultum* K.H. Larss. & Hjortstam, saprobes, terrestrial, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Lopharia Kalchbr. & MacOwan 1881, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, seven species, type species *L. lirellosa* Kalchbr. & MacOwan [current name: *L. mirabilis* (Berk. & Broome) Pat.], corticioid or stereoid basidioma, smooth hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), some species can be used as water-cleaning agent, see Wang et al. 2010b (inhibit growth of *Microcystis aeruginosa* in water, *L. spadicea* (Pers.) Boidin), sequence data available, see Binder et al. 2013 (phylogeny, Polyporales), Liu et al. 2018a (new spp., phylogeny, China, monograph).

Loreleia Redhead, Moncalvo, Vilgalys & Lutzoni 2002, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, three species, type species *L. postii* (Fr.) Redhead, Moncalvo, Vilgalys & Lutzoni, Europe, sequence data unavailable, see Kirk et al. 2008.

Loweomyces (Kotl. & Pouzar) Jülich 1982, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, six species, type species *L. fractipes* (Berk. & M.A. Curtis) Jülich, poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Westphalen et al. 2016a (new spp., phylogeny, monograph, Brazil).

Luellia K.H. Larss. & Hjortstam 1974, Hydnodontaceae, Trechisporales, Agaricomycetes, asexual morph unknown, three species, type species *L. recondita* (H.S. Jacks.) K.H. Larss. & Hjortstam, wood-decaying, Europe, see Kirk et al. 2013 (genus accepted), sequence data available.

Lulesia Singer 1970, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *L. densifolia* (Singer) Singer, tropical, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Luteoporia F. Wu, Jia J. Chen & S.H. He 2016, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *L. albomarginata* F. Wu, Jia J. Chen & S.H. He, wood-rotting, causing a white rot, China, sequence data available, see Wu et al. 2016b (taxonomy, China), Zmitrovich 2018a (taxonomy).

Lutypha Khurana, K.S. Thind & Berthier 1977, Typhulaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *L. sclerotiophila* Khurana, K.S. Thind & Berthier, India, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Lycogalopsis E. Fisch. 1886, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *L. solmsii* E. Fisch., tropical, see Kirk et al. 2013 (genus accepted), sequence data available, see Demoulin et al. 2013 (phylogeny).

Lycoperdon Pers. 1794 (= *Vascellum* F. Šmarda 1958), Lycoperdaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 55 species, type species *L. perlatum* Pers., worldwide, puffball, some species edible, gem-studded puffball (*L. perlatum* Pers.), see Hall et al. 2003 (edible mushrooms), Colak et al. 2009 (compounds), Dai et al. 2010b (Chinese edible mushrooms), Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Jeppson 2008 (phylogeny), Vellinga et al. 2011 (phylogeny), new spp. see Cortez et al. 2011 (Brazil), Jeppson et al. 2012 (Europe), Kim et al. 2016 (Korea).

Lycoperdopsis Henn. 1900, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *L. arcyrioides* Henn. & E. Nyman, tropical, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Lyoathelia Hjortstam & Ryvarden 2004, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, one species, type species *L. laxa* (Burt) Hjortstam & Ryvarden, Canada, sequence data unavailable, see Kirk et al. 2008.

Lyophyllopsis Sathe & J.T. Daniel 1981, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *L. keralensis* Sathe & J.T. Daniel, India, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Lyophyllum P. Karst. 1881, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 60 species, type species *L. leucophaeatum* (P. Karst.) P. Karst., worldwide, some species edible, honshimeji (*L. shimeji* (Kawam.) Hongo), see Hall et al. 2003 (edible mushrooms), Dai et al. 2010b (Chinese edible mushrooms), Zhang et al. 2010b (compounds), Kirk et al. 2013 (genus accepted), sequence data available, see Bellanger et al. 2015 (phylogeny), new spp. see Dähncke et al. 2010 (Canary Islands, Spain), Vizzini and Contu 2010 (Canary Islands, Spain), Wang et al. 2013b (China), Cooper 2014b (New Zealand), Lavorato and Contu 2015 (Italy), Sesli et al. 2015 (Turkey).

Lysurus Fr. 1823, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, c. 30 species, type species *L. mokusin* (L.) Fr, terrestrial, widespread (esp. tropical), see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006 (phylogeny), new spp. see Gogoi and Parkash 2015 (India), new combination, see Trierveiler-Pereira et al. 2014a.

Macabuna Buriticá & J.F. Hennen 1994, Phakopsoraceae, Pucciniales, Pucciniomycetes, asexual genus, seven species, type species *M. ziziphi* (Pat.) Buriticá & J.F. Hennen, biotrophic on Bignoniaceae, Poaceae, Rhamnaceae, Salicaceae, Vochysiaceae, terrestrial, Brazil, Luxembourg, Sri Lanka, Vietnam, sequence data unavailable, see Cummins and Hiratsuka 2003 (synonym of *Calidion*), Kirk et al. 2013 (genus accepted).

Macalpinomyces Langdon & Full. 1977, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, 41 species, type species *M. eriachnes* (Thüm.) Langdon & Full., plant parasites (ovaries) on Poaceae, widespread in Australia, South Asia, Africa, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (phylogeny).

Maccagnia Mattir. 1922, Hydnangiaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *M. carnica* Mattir., Italy, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Mackintoshia Pacioni & Sharp 2000, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *M. persica* Pacioni & C. Sharp, sequestrate, Africa, sequence data available, see Smith et al. 2015 (phylogeny).

Macrocybe Pegler & Lodge 1998, Biannulariaceae, Agaricales, Agaricomycetes, asexual morph unknown, seven species, type species *M. titans* (H.E. Bigelow & Kimbr.) Pegler, Lodge & Nakasone, tropics, some species edible (*M. gigantea* (Massee) Pegler & Lodge 1998), see Dai et al. 2010b (Chinese edible mushrooms), Kirk et al. 2013 (genus accepted), Wiejak et al. 2014 (bioconcentration), Razaq et al. 2016 (Asian, *M. gigantea*), sequence data available, see Razaq et al. 2016 (Asian, *M. gigantea*), Sánchez-García et al. 2016 (*M. titans* in Biannulariaceae, phylogeny, new family)

Macrocystidia Joss. 1934, Macrocystidiaceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *M. cucumis* (Pers.) Joss., saprophytic, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Walther et al. 2005 (phylogeny), Matheny et al. 2006 (phylogeny), Dentinger et al. 2015 (phylogeny).

Macrohyporia I. Johans. & Ryvarden 1979, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *M. dictyopora* (Sacc.) I. Johans. & Ryvarden, resupinate basidioma, poroid hymenophore, wood-rotting, widespread (tropical), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Macrolepiota Singer 1948, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 40 species, type species *M. procera* (Scop.) Singer, saprotrophic and terrestrial, agaricoid, sequestrate, worldwide, some species edible, parasol mushroom (*M. procera* (Scop.) Singer), see Hall et al. 2003 (edible mushrooms), Falandysz et al. 2008 (mineral constituents), Dai et al. 2010b (Chinese edible mushrooms), Kirk et al. 2013 (genus accepted), sequence data available, see Vellinga 2004 (Australia, monograph), Ge et al. 2010 (China, monograph), Barseghyan et al. 2012 (phylogeny, Israel), Lebel and Syme 2012 (Australia, sequestrate species), new spp. see Ge et al. 2012 (China), Perez et al. 2018 (Brazil).

Macrometrula Donk & Singer 1948, Psathyrellaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *M. rubriceps* (Cooke & Massee) Donk & Singer, British Isles, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Macrotyphula R.H. Petersen 1972, Typhulaceae, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *M. fistulosa* (Holmsk.) R.H. Petersen [current name: *Typhula fistulosa* (Holmsk.) Olariaga], worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2004 (phylogeny, corticioid homobasidiomycetes), Dentinger and McLaughlin 2006 (phylogeny), Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), new combinations see Olariaga and Salcedo 2013 (clavarioid fungi).

Macruropyxis Azbukina 1972, Uropyxidaceae, Pucciniales, Pucciniomycetes, two species, type species *M. fraxini* (Kom.) Azbukina, biotrophic on Fabaceae (*Mimosa*), terrestrial, West Indies, see Kirk et al. 2013 (genus accepted), sequence data available, see Martin et al. 2017 (phylogeny, new spp., South Africa).

Maireina W.B. Cooke 1961, Niaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 18 species, type species *M. monacha* (Speg.) W.B. Cooke [current name: *Merismodes bresadolae* (Grélet) Singer], worldwide, basidioma cyphelloid, sequence data unavailable, new spp. see Bodensteiner 2007 (key).

Malajczukia Trappe & Castellano 1992, Mesophelliaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, eight species, type species *M. viridigleba* Trappe & Castellano, Australia, New Zealand, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006 (phylogeny).

Malassezia Baillon 1889, Malasseziaceae, Malasseziales, Malasseziomycetes, sexual morph unknown, 18wa species, type species *M. furfur* (C.P. Robin) Baill., saprobic, lipophilic, animal skin, some species pathogenic, see Velegraki et al. 2015, widespread, see Kurtzman et al. 2011 (taxonomy), Kirk et al. 2013 (genus accepted), cultures available, sequence data available, see Begerow et al. 2000, Wang et al. 2014a, 2015c, Wu et al. 2015f (phylogeny, genome).

Manuripia Singer 1960, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *M. bifida* Singer, Bolivia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Marasmiellus Murrill 1915, Omphalotaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 260 species, type species *M. juniperinus* Murrill, saprobic, few parasitic on economically important plants (*M. cocophilus* Pegler, on root of *Cocos nucifera* causing bole rot, Pegler 1977), Nemergut et al. 2000 (bioremediation), worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Dutta et al. 2015a (phylogeny), new spp. see Noordeloos and Antonín 2008 (Europe), Kerekes and Desjardin 2009 (monograph, *Crinipellis*, *Moniliophthora,* Southeast Asia), Antonín et al. 2010c (Korea), Antonín and Noordeloos 2010 (Europe), Capelari et al. 2010b (Brazil), Desjardin and Hemmes 2011 (Hawaii), Perez-De-Gregorio et al. 2011 (Mediterranean), Mešić et al. 2012 (Croatia), Retnowati 2012 (Java and Bali), Blanco-Dios 2015 (Spain), Dutta et al. 2015c (India), Terashima et al. 2016 (Japan), Retnowati 2018 (Java, Bali), Sesli et al. 2018b (Turkey).

Marasmius Fr. 1836, Marasmiaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 600 species, type species *M. rotula* (Scop.) Fr., mostly saprophytic, few parasitic (*M. palmivorus* Sharples, bunch rot of oil palm, postharvest disease of coconut seedlings, on living *Lagerstroemia speciosa* tree, see Pong et al. 2012, Almaliky et al. 2013, Dutta and Acharya 2018), worldwide, some species edible, fairy ring mushroom (*M. oreades* (Bolton) Fr.), see Hall et al. 2003 (edible mushrooms), Dai et al. 2010b (edible mushrooms), Mešić and Tkalčec 2010 (new names), Gröbe et al. 2011 (compounds), Kirk et al. 2013 (genus accepted), sequence data available, see Puccinelli and Capelari 2009 (Brazil, section *Sicci*), Wannathes 2009 (Northern Thailand, monograph), Antonín et al. 2010b (Korea, section *Globulares*), Antonín and Noordeloos 2010 (Europe), Noordeloos 2012a (key, Europe), Antonín et al. 2012b, c (Korea, section *Sicci,* section *Hygrometrici*), Antonín 2013 (tropical Africa), Shay et al. 2017 (Madagascar), new spp. see Işıloğlu et al. 2009 (Turkey), Wannathes et al. 2009 (Northern Thailand), Antonín et al. 2010a, b (Korea), Deng and Li 2011 (China), Deng et al. 2011 (China), Papinutti and Lechner 2011 (Argentina), de Oliveira and Capelari 2012 (Brazil), Deng et al. 2012 (China), Yang et al. 2013a (China), de Oliveira et al. 2014 (Brazil), Dutta et al. 2014 (India), Kiyashko et al. 2014 (Russia), Deng at al. 2015a (China), Dutta et al. 2015a (India), Wang and Tzean 2015 (China), Farook and Manimohan 2015 (India), de Oliveira and Capelari 2016 (Brazil), Komura et al. 2016 (central Amazonia), Magnago et al. 2016 (Brazil), Deng et al. 2017 (China), Liang et al. 2017a (China), Shay et al. 2017 (Madagascar), Tibpromma et al. 2017 (India), Niveiro et al. 2018 (Argentina), Sharafudheen and Manimohan 2018 (India), Wang et al. 2018e (India).

Maravalia Arthur 1922, Chaconiaceae, Pucciniales, Pucciniomycetes, (= *Acervulopsora* Thirum. 1945, = *Angusia* G.F. Laundon 1964, = *Argomycetella* Syd. 1922, = *Scopella* Mains 1939, = *Scopellopsis* T.S. Ramakr. & K. Ramakr. 1947), 41 species, type species *M. pallida* Arthur & Thaxt. ex Arthur, biotrophic on Acanthaceae, Apocynaceae, Erythroxylaceae, Euphorbiaceae, Fabaceae, Periplocaceae, Rubiaceae, Sapotaceae, Verbenaceae, Zingiberaceae, terrestrial, circumglobal in tropics and subtropics, see Kirk et al. 2013 (genus accepted), sequence data available, see McTaggart et al. 2016a (phylogeny), new spp. see McTaggart et al. 2008 (key to species on Fabaceae), de Carvalho and Hennen 2009 (key to species).

Marchandiomyces Diederich & D. Hawksw. 1990, Corticiaceae, Corticiales, Agaricomycetes, sexual morph previously known in *Marchandiomphalina* Diederich, Manfr. Binder & Lawrey 2007, three species, type species *M. corallinus* (Roberge) Diederich & D. Hawksw., lichenicolous, widespread, see Kirk et al. 2013 (genus accepted), sequence data available see Lawrey et al. 2008 (new spp., phylogeny), Diederich et al. 2018a (exclusion of some species).

Marthanella States & Fogel 1999, *incertae sedis*, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *M. nidulosa* States & Fogel, USA,

sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Masseeëlla Dietel 1895 (= *Kamatomyces* Sathe 1966), *incertae sedis*, Pucciniales, Pucciniomycetes, six species, type species *M. capparis* (Hobson bis ex Cooke) Dietel, biotrophic on Euphorbiaceae, Rhamnaceae, terrestrial, Ethiopia, India, Philippines, see Kirk et al. 2013 (genus accepted), sequence data available, see McTaggart et al. 2016a (phylogeny, evolution).

Matula Massee 1888, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, two species, type specie *M. poroniiforme* (Berk. & Broome) Massee, wood-decaying, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Mayamontana Castellano, Trappe & Lodge 2007, Stephanosporaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type specie *M. coccolobae* Castellano, Trappe & Lodge, wood-decaying, North America, sequence data available, see Lebel et al. 2015 (phylogeny).

Megacollybia Kotl. & Pouzar 1972, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, nine species, type species *M. platyphylla* (Pers.) Kotl. & Pouzar, saprophytic, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Hughes et al. 2007 (monograph), new spp. see Coimbra et al. 2013b (Brazil), Antonín et al. 2019 (phylogeny).

Megalocystidium Jülich 1978, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, seven species, type species *M. leucoxanthum* (Bres.) Jülich, wood-decaying, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Larsson 2003 (phylogeny).

Megasporia B.K. Cui, Y.C. Dai & Hai J. Li 2013, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, ten species, type species *M. hexagonoides* (Speg.) B.K. Cui, Y.C. Dai & Hai J. Li, resupinate basidioma, poroid hymenophore, wood-rotting, white rot, widespread (subtropical, tropical), sequence data available, see Li and Cui 2013b (new spp., new combinations, phylogeny, China), Yuan et al. 2017d (new spp. phylogeny, monograph, China).

Megasporoporia Ryvarden & J.E. Wright 1982, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *M. setulosa* (Henn.) Rajchenb., resupinate basidioma, poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Li and Cui 2013b (new spp., phylogeny, monograph, China).

Megasporoporiella B.K. Cui, Y.C. Dai & Hai J. Li 2013, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *M. cavernulosa* (Berk.) B.K. Cui, Y.C. Dai & Hai J. Li, resupinate basidioma, poroid hymenophore, wood-rotting, white rot, widespread (temperate region), sequence data available, see Li and Cui 2013b (new spp., new combinations, phylogeny, monograph, China).

Mehtamyces Mundk. & Thirum. 1945, *incertae sedis*, Pucciniales, Pucciniomycetes, one species, type species *M. stereospermi* (Mundk.) Mundk. & Thirum., biotrophic on Bignoniaceae, terrestrial, India, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Meiorganum R. Heim 1966, Paxillaceae, Boletales, Agaricomycetes, asexual morph unknown, three species, type species *M. neocaledonicum* R. Heim, Malaysia, New Caledonia, America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Meira Boekhout, Scorzetti, Gerson & Sztejnb. 2003, Brachybasidiaceae, Exobasidiales, Exobasidiomycetes, four species, type species *M. geulakonigii* Boekhout, Scorzetti, Gerson & Sztejnb., known only from saprobic states, anamorphic genus, widespread, epiphytes and endophytes, biocontrol of citrus mites, see Gerson et al. 2008 (biological control), Kurtzman et al. 2011 (taxonomy), cultures available, sequence data available, see Begerow et al. 2014, Wang et al. 2015c, new spp. see Rush and Aime 2013 (USA), Limtong et al. 2017 (Thailand).

Melampsora Castagne 1843, (= *Chnoopsora* Dietel 1906; = *Mesopsora* Dietel 1922; = *Necium* Arthur 1907; = *Podocystis* Fr. 1849; = *Podosporium* Lév. 1847), Melampsoraceae, Pucciniales, Pucciniomycetes, c. 100 species, type species *M. euphorbiae* (Ficinus & C. Schub.) Castagne, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Damadi et al. 2011 (phylogeny), Toome and Aime 2015 (phylogeny), Zhao et al. 2015e, f (phylogeny), Ali et al. 2016 (phylogeny), Zhao et al. 2017b (*M. epitea* complex, phylogeny).

Melampsorella J. Schröt. 1874, Pucciniastraceae, Pucciniales, Pucciniomycetes, two species, type species *M. caryophyllacearum* (DC.) J. Schröt., biotrophic on Boraginaceae, Caryophyllaceae, Pinaceae (alternate host), terrestrial, Europe, North America, Japan, Korea, Russia, see Kirk et al. 2013 (genus accepted), sequence data available, see Maier et al. 2003 (phylogeny).

Melampsoridium Kleb. 1899, Pucciniastraceae, Pucciniales, Pucciniomycetes, eleven species, type species *M. betulinum* (Pers.) Kleb., biotrophic on Betulaceae, Magnoliaceae, Pinaceae (alternate host), terrestrial, Central and North America, Europe, Asia, New Zealand (introduced), see Kirk et al. 2013 (genus accepted), sequence data available, see Aime et al. 2018a (phylogeny, evolution between host, Pucciniales).

Melaniella R. Bauer, Vánky, Begerow & Oberw. 1999, Melaniellaceae, Doassansiales, Exobasidiomycetes, two species, type species *M. oreophila* (Syd.) R. Bauer, Vánky,

Begerow & Oberw., plant parasites (leaves, stems) on Selaginellaceae, Indo-Pacific, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Melanoderma B.K. Cui & Y.C. Dai 2011, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *M. microcarpum* B.K. Cui & Y.C. Dai, poroid hymenophore, wood-rotting, white rot, China, sequence data available, see Cui et al. 2011b (taxonomy, phylogeny, China), Yuan and Kan 2015 (new sp., phylogeny, tropical China).

Melanogaster Corda 1831, Paxillaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 26 species, type species *M. tuberiformis* Corda, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Moreau et al. 2013 (Europe, taxonomy), Truong et al. 2017b (diversity).

Melanoleuca Pat. 1897, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. 60 species, type species *M. polioleuca* (Fr.) Kühner & Maire, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Vizzini et al. 2012e (Europe), new spp. see Sánchez-García et al. 2013 (Mexico), Antonín et al. 2014b, 2015b, 2017b (Hungary, Europe, Korea), Yu et al. 2014 (China), Nawaz et al. 2017 (Pakistan).

Melanomphalia M.P. Christ. 1936, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *M. nigrescens* M.P. Christ., Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Guzmán-Dávalos et al. 2017 (*M. argipoda* is the basionym of *Crepidotus argipodus*).

Melanophyllum Velen. 1921, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *M. haematospermum* (Bull.) Kreisel, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Vellinga 2003 (phylogeny), Vellinga 2004 (phylogeny), Vellinga et al. 2011 (phylogeny).

Melanopsichium Beck 1894, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, two species, type species *M. austroamericanum* (Speg.) Beck, plant parasites (galls, various parts) on Polygonaceae, widespread, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Melanotaenium de Bary 1874, Melanotaeniaceae, Ustilaginales, Ustilaginomycetes, nine species, type species *M. endogenum* (Unger) de Bary, plant parasite (leaves, roots, stems) on dicots, North America, South America, Northern Africa, Asia, Australasia, Europe, see Kirk et al. 2013 (genus accepted), cultures available, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Melanotus Pat. 1900, Strophariaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 33 species, type species *M. bambusinus* (Pat.) Pat., most species transferred to *Deconica* (W.G. Sm.) P. Karst., saprotrophic on wood and herbs, sequence data available, see Moncalvo et al. 2002 (phylogeny), recognized as *Deconica* sect. *Melanotus* (Pat.) Noordel., see Noordeloos 2011.

Melanoxa M. Lutz, Vánky & R. Bauer 2013, Urocystidaceae, Urocystidales, Ustilaginomycetes, two species, type species *M. oxalidis* (Dietz & G.W. Fisch.) M. Lutz, Vánky & R. Bauer, plant parasites (vegetative parts) on Oxalidaceae, North America, cultures unavailable, sequence data available, Lutz et al. 2012, Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Melanustilospora Denchev 2003, Urocystidaceae, Urocystidales, Ustilaginomycetes, two species, type species *M. ari* (Cooke) Denchev, plant parasites (leaves) on Araceae, Europe, cultures unavailable, sequence data available, see Begerow et al. 2014, Nasr et al. 2014a (taxonomy).

Melzericium Hauerslev 1975, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, three species, type species *M. udicola* (Bourdot) Hauerslev, widespread, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Melzerodontia Hjortstam & Ryvarden 1980, *incertae sedis*, Corticiales, Agaricomycetes, asexual morph unknown, three species, type species *M. aculeata* Hjortstam & Ryvarden, wood-decaying, Tanzania, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Membranomyces Jülich 1975, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph unknown, one species, type species *M. spurius* (Bourdot) Jülich, ectomycorrhizal, Asia, Middle East, Europe, Canada, USA, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2006 (phylogeny, cantharelloid clade), Larsson 2007b (phylogeny, corticioid fungi), Argüelles-Moyao et al. 2017 (ecology).

Mensularia Lázaro Ibiza 1916, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, six species, type species *M. radiata* (Sowerby) Lázaro Ibiza [current name: *Xanthoporia radiata* (Sowerby) Ţura, Zmitr., Wasser, Raats & Nevo], wood-rotting, widespread, sequence data available, new spp. see Zhou 2014a (China), Wu et el. 2015b (China).

Meottomyces Vizzini 2008, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *M. dissimulans* (Berk. & Broome) Vizzini, Northern hemisphere, saprotrophic, sequence data available, see Garnica et al. 2007 (phylogeny), Vizzini 2008 (taxonomy), Halama and Rutkowski 2016 (new record, Poland).

Meredithblackwellia Toome & Aime 2013, Kriegeriaceae, Kriegeriales, Microbotryomycetes, sexual morph unknown, one species, type species *M. eburnea* Toome & Aime, yeast, plant material (fern), South America (Guyana), cultures and sequence data available, see Toome et al. 2013, Wang et al. 2015d, e (taxonomy, phylogeny).

Meripilus P. Karst. 1882, Meripilaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *M. giganteus* (Pers.) P. Karst., basidioma composed of numerous pilei from a short stipe or base, poroid hymenophore, terrestrial or wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Justo et al. 2017 (phylogeny, Polyporales).

Merismodes Earle 1909, Niaceae, Agaricales, Agaricomycetes, asexual morph unknown, 20 species, type species *M. fasciculata* (Schwein.) Donk, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Bodensteiner et al. 2004 (phylogeny, cyphelloid homobasidiomycetes).

Merulicium J. Erikss. & Ryvarden 1976, Pterulaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *M. fusisporum* (Romell) J. Erikss. & Ryvarden, Nordic, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson 2007b (phylogeny).

Meruliophana Duhem & Buyck 2011, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *M. mahorensis* Duhem & Buyck, resupinate meruloid basidioma, wood-rotting, Mayotte (France, Comoro Islands, Indian Ocean), sequence data unavailable, see Duhem and Buyck 2011c (taxonomy, Mayotte).

Meruliopsis Bondartsev 1959, Irpicaceae, Polyporales, Agaricomycetes, asexual morph unknown, four species, type species *M. taxicola* (Pers.) Bondartsev, resupinate basidioma, merulioid or poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2013 (phylogeny, Polyporales), Jung et al. 2018 (phylogeny, new combination, *Gloeoporus s. l.*).

Merulius Fr. 1821, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 150 species, type species *M. tremellosus* Schrad., the generic limit of *Merulius* is not currently settled, see Justo et al. 2017 (phylogeny, Polyporales), merulioid basidioma, wood-rotting, white rot, widespread, sequence data available, see Binder et al. 2013 (phylogeny, Polyporales), Zmitrovich 2018a (taxonomy).

Mesophellia Berk. 1857, Mesophelliaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, c. 15 species, type species *M. arenaria* Berk., Australia, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006, 2008 (phylogeny, phylogeography).

Mesophelliopsis Bat. & A.F. Vital 1957, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *M. pernambucensis* Bat. & A.F. Vital, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Metabourdotia L.S. Olive 1957, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *M. tahitiensis* L.S. Olive, Tahiti, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Metraria (Cooke) Cooke & Massee 1891, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *M. insignis* Sacc., Australia, Nigeria, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Metrodia Raithelh. 1971, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *M. collybioides* Raithelh., Argentina, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Metulocyphella Agerer 1983, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *M. lanceolata* Agerer, saprophytic, South America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Metulodontia Parmasto 1968, Peniophoraceae, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *M. nivea* (P. Karst.) Parmasto, wood-rotting, white rot, sequence data available, see Larsson and Larsson 2003 (phylogeny, russuloid basidiomycetes).

Metuloidea G. Cunn. 1965, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *M. tawa* (G. Cunn.) G. Cunn., poroid or hydnoid hymenophore, wood-rotting, white rot, widespread, sequence data available, see Miettinen and Ryvarden 2016 (new combinations, phylogeny, revision, monograph, genus accepted), Zmitrovich 2018a (taxonomy).

Microbotryozyma S.O. Suh, D.A. Maslov, R.E. Molestina & J.J. Zhou 2012, Ustilentylomataceae, Microbotryales, Microbotryomycetes, sexual morph unknown, one species, type species *M. collariae* S.O. Suh, D.A. Maslov, R.E. Molestina & J.J. Zhou, insect, Costa Rica, cultures and sequence data available, see Suh et al. 2012 (taxonomy), Wang et al. 2015d, e (taxonomy and phylogeny).

Microbotryum Lév. 1847, Microbotryaceae, Microbotryales, Microbotryomycetes, c. 100 species, type species *M. violaceum* (Pers.) G. Deml & Oberw., worldwide, pathogenic, see Hood et al. 2010 (pathogenic on Caryophyllaceae), Schäfer et al. 2010 (life cycle on *Silene latifolia*), Badouin et al. 2015 (mating-type chromosomes, *M. lychnidis-dioicae*), sequence data available, see Kemler et al. 2009 (phylogeny), new spp., see He and Guo 2008

(China), Piątek et al. 2012, 2013a (Europe), Ziegler et al. 2018 (Germany).

Microporellus Murrill 1905, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 20 species, type species *M. dealbatus* (Berk. & M.A. Curtis) Murrill, stipitate basidioma, poroid hymenophore, wood-rotting, widespread (pantropical), sequence data unavailable, new spp. see Decock 2007 (new combination, morphology, Gabon), Medeiros and Ryvarden 2011 (morphology, south America), Kirk et al. 2013 (genus accepted).

Microporus P. Beauv. 1805, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 13 species, type species *M. perula* P. Beauv. (= *M. xanthopus* (Fr.) Kuntze, *fide* Li et al. 2014c), stipitate basidioma, poroid hymenophore, wood-rotting, widespread (paleotropical), see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, new combinations see Hattori and Sotome 2013 (morphology, type study, Malaysia, Singapore).

Micropsalliota Höhn. 1914 (= *Allopsalliota* Nauta & Bas 1999), Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 70 species, type species *M. pseudovolvulata* Höhn., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Zhao et al. 2010 (Northern Thailand, monograph), Parra et al. 2016 (phylogeny), new spp. see Wei et al. 2015 (China), Chen et al. 2016c (Thailand), Terashima et al. 2016 (Japan).

Microsebacina P. Roberts 1993, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, two species, type species *M. fugacissima* (Bourdot & Galzin) P. Roberts, Tahiti, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Microsporomyces Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, Microsporomycetaceae, *incertae sedis*, Cystobasidiomycetes, sexual morph unknown, four species, type species *M. magnisporus* (Nakase, Tsuzuki, F.L. Lee, Sugita, Jindam. & M. Takash.) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, worldwide, cultures and sequence data available, see Wang et al. 2015d, e (taxonomy, phylogeny), Bai et al. 2016 (new spp., China).

Microstella K. Ando & Tubaki 1984, *incertae sedis*, *incertae sedis*, Basidiomycota, sexual morph Basidiomycota, one species, type species *M. pluvioriens* K. Ando & Tubaki, Japan, aquatic, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Microstroma Niessl 1861, Microstromataceae, Microstromatales, Exobasidiomycetes, 16 species, type species *M. album* (Desm.) Sacc., plant parasites (leaves) mainly on Fagales, widespread, saprobic yeast states, see Kirk et al. 2013 (genus accepted), cultures available, sequence data available, see Begerow et al. 2014, Wang et al. 2015c, Kijpornyongpan and Aime 2016.

Mikronegeria Dietel, in Dietel & Neger 1899 [1900], Mikronegeriaceae, Pucciniales, Pucciniomycetes, three species, type species *M. fagi* Dietel & Neger, biotrophic on Araucariaceae, Cupressaceae and Podocarpaceae (alternate hosts), Fagaceae, Onagraceae, terrestrial, South America (Argentina, Chile), New Zealand, see Kirk et al. 2013 (genus accepted), sequence data available, see Padamsee and McKenzie 2017 (phylogeny, new combination, New Zealand).

Milesia F.B. White 1878 [1877–1878], Pucciniastraceae, Pucciniales, Pucciniomycetes, c. 20 species, type species *M. polypodii* F.B. White, biotrophic on Polypodiaceae, other families as asexual morph of various rust genera (*Cronartium*, *Hyalopsora*, *Melampsorella*, *Melampsoridium*, *Milesina*, *Naoidemyces*, *Pucciniastrum*, *Thekopsora*, *Uredinopsis*), terrestrial, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Maier et al. 2003 (phylogeny), new spp. see Berndt 2008a (new records), McKenzie 2008, Yepes and de Carvalho 2009 (new species as asexual morph of *Phakopsora sennae*), Afshan et al. 2010a.

Milesina Magnus 1909, Pucciniastraceae, Pucciniales, Pucciniomycetes, c. 65 species, type species *M. kriegeriana* (Magnus) Magnus, biotrophic on Pinaceae (alternate host), Polypodiaceae, terrestrial, North, South (Ecuador) and Central America, Europe, southern Africa, Asia, New Zealand, see Berndt 2008a (new names, new records), Kirk et al. 2013 (genus accepted), sequence data available, see McTaggart et al. 2014 (phylogeny, rust on ferns).

Mimema H.S. Jacks. 1931, Uropyxidaceae, Pucciniales, Pucciniomycetes, one species, type species *M. holwayi* H.S. Jacks., biotrophic on Fabaceae (*Mimosa*), terrestrial, South America (Brazil), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Minimedusa Weresub & P.M. LeClair 1971, *incertae sedis*, Cantharellales, Agaricomycetes, three species, type species *M. polyspora* (Hotson) Weresub & P.M. LeClair, see Kirk et al. 2013 (genus accepted), sequence data available, see Lawrey et al. 2007 (lichen-associated homobasidiomycetes, phylogeny).

Minostroscyta Hjortstam & Ryvarden 2001, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, one species, type species *M. discoidalis* Hjortstam & Ryvarden, Colombia, sequence data unavailable, see Kirk et al. 2008.

Mixia C.L. Kramer 1959, Mixiaceae, Mixiales, Mixiomycetes, presumably anamorphic (interpretation of sporogenous cells and spores remains ambiguous), yeast stage known, one species, type species *M. osmundae* (Nishida) C.L. Kramer, intracellular phytoparasite on *Osmunda* and *Osmundastrum* ferns, China, Japan and USA, see Sugiyama and Katumoto 2008 (genus accepted), Kurtzman et al. 2011 (taxonomy), Sugiyama et al. 2018

(review), sequence data available, see Aime et al. 2006 (phylogeny), Bauer et al. 2006 (phylogeny, simple-septate basidiomycetes), Nishida et al. 2011 (genome sequencing), Toome et al. 2014 (genome sequencing), Aime et al. 2014 (phylogeny), Wang et al. 2015d, e (phylogeny, yeast), Sugiyama et al. 2018 (taxonomy, phylogeny).

Miyagia Miyabe ex Syd. & P. Syd. 1913 (= *Peristemma* Syd. 1921), Pucciniaceae, Pucciniales, Pucciniomycetes, three species, type species *M. anaphalidis* Miyabe, biotrophic, terrestrial, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Padamsee and McKenzie 2017 (phylogeny, new combination, New Zealand).

Moesziomyces Vánky 1977, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, seven species, type species *M. bullatus* (J. Schröt.) Vánky, plant parasites (ovaries) on Poaceae, widespread, saprobic yeast states on plants, cultures available, see Kirk et al. 2013 (genus accepted), sequence data available, see Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Mollicarpus Ginns 1984, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *M. cognatus* (Berk.) Ginns, pileate basidioma, poroid hymenophore, wood-rotting, southeast Asia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Moniliella Stolk & Dakin 1966, Moniliellaceae, Moniliellales, Moniliellomycetes, 15 species, type species *M. acetoabutans* Stolk & Dakin, known only from saprobic states, osmotolerant, widespread, see Kurtzman et al. 2011 (taxonomy), Kirk et al. 2013 (genus accepted), erythritol-producing, see Lin et al. 2010 (production of erythritol), Kobayashi et al. 2015 (production of erythritol), sequence data availbale, cultures available, see Rosa et al. 2009 (phylogeny, new spp.), new spp see Thanh et al. 2012, 2013, 2018 (Vietnam), Wang et al. 2014a, 2015c (phylogeny).

Moniliophthora H.C. Evans, Stalpers, Samson & Benny 1978, Marasmiaceae, Agaricales, Agaricomycetes, asexual morph unknown, seven species, type species *M. roreri* (Cif.) H.C. Evans, Stalpers, Samson & Benny, worldwide, pathogen causes Witches' broom disease, see Kerekes and Desjardin 2009 (monograph, *Crinipellis*, *Moniliophthora,* southeast Asia), Marelli et al. 2009 (infection biology), Kirk et al. 2013 (genus accepted), sequence data available, see Mondego et al. 2008 (genome), Barbosa et al. 2018 (Genome sequence and effectorome), new spp. see Kropp and Albee-Scott 2012 (Samoan Islands).

Monosporidium Barclay 1888 [1887] (= *Kulkarniella* Gokhale & Patel 1952 [1951]), Phakopsoraceae, Pucciniales, Pucciniomycetes, three species, type species *M. euphorbiae* Barclay ex Sacc. 1891, biotrophic on Euphorbiaceae, Phyllanthaceae, Rubiaceae, terrestrial, India, see Cummins and Hiratsuka 2003 (synonym of *Endophyllum*), sequence data unavailable, Kirk et al. 2013 (genus accepted).

Montagnea Fr. 1836, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *M. arenaria* (DC.) Zeller, secotioid, subtropical try areas, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny).

Moreaua Liou & H.C. Cheng 1949, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, 39 species, type species *M. kungii* Liou & H.C. Cheng, plant parasite (surface of inner floral organs) on Cyperaceae, widespread (especially Australia), see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Morganella Zeller 1948, Lycoperdaceae, Agaricales, Agaricomycetes, asexual morph unknown, seven species, type species *M. mexicana* Zeller, worldwide, see Kirk et al. 2013 (genus accepted), Alfredo et al. 2017 (Brazil), sequence data available, gasteroid, see Larsson and Jeppson 2008 (phylogeny), new spp. see Alfredo et al. 2012a (Brazil), Alves and Cortez 2013b (Brazil), Alfredo et al. 2014b (Brazil), Alves et al. 2017 (Brazil).

Morispora Salazar-Yepes, Pardo-Card. & Buriticá 2007, Phragmidiaceae, Pucciniales, Pucciniomycetes, sexual morph *Gerwasia* Racib. 1909, one species, type species *M. tenella* (H.S. Jacks. & Holw.) Salazar-Yepes, Pardo-Card. & Buriticá, biotrophic on Rosaceae (*Rubus*), terrestrial, South America (Ecuador), sequence data unavailable, see Salazar-Yepes et al. 2007 (taxonomy, morphology).

Mrakia Y. Yamada & Komag. 1987, Mrakiaceae, Cystofilobasidiales, Tremellomycetes, sexual and asexual morphs known, twelve species, type species *M. frigida* (Fell, Statzell, I.L. Hunter & Phaff) Y. Yamada & Komag., yeast, psychrophilic, widespread, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (taxonomy, phylogeny), Tsuji et al. 2018, 2019 (new spp.).

Mucidula Pat. 1887, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *M. mucida* (Schrad.) Pat., sequence data available, see Petersen and Hughes 2010 (phylogeny), Schoch et al. 2014 (molecular sequences for reference specimens).

Mucilopilus Wolfe 1979, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *Fistulinella viscida* (McNabb) Singer, stipitate-pileate, presumably ectomycorrhizal, tropical to subtropical, sequence data available, *M. castaneiceps* does not form a monophyletic group with some *Fistulinella* spp., see Wu et al. 2016f (taxonomy, phylogeny).

Mucronella Fr. 1874, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, eight species, type species *M. calva* (Alb. & Schwein.) Fr., worldwide, see

Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2004 (phylogeny, corticioid homobasidiomycetes), Dentinger and McLaughlin 2006 (phylogeny, Clavariaceae).

Multiclavula R.H. Petersen 1967, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph unknown, 13 species, type species *M. corynoides* (Peck) R.H. Petersen, saprobes, lichenized, terrestrial, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Nelsen et al. 2007 (North America, phylogeny).

Multifurca Buyck & V. Hofst. 2008, Russulaceae, Russulales, Agaricomycetes, asexual morph unknown, ten species, type species *M. ochricompacta* (Bills & O.K. Mill.) Buyck & V. Hofst., two subgenera (subg. *Furcata* for lactarioid species, subg. *Multifurca* for russuloid species), agaricoid, presumed ectomycorrhizal, terrestrial, worldwide (unknown from Africa and South America), amphi-pacific distribution with strong preference for the (sub)tropical zone of the Northern Hemisphere, Wang and Liu 2010 (new record, morphology, China), sequence data available, see Buyck et al. 2008 (phylogeny), Wang et al. 2018d (biogeography, new subgenus), Das et al. 2018 (epitypification), new spp. see Lebel et al. 2013 (Australia).

Mundkurella Thirum. 1944, Urocystidaceae, Urocystidales, Ustilaginomycetes, five species, type species *M. heptapleuri* Thirum., plant parasites (leaves, petioles, stems, leaves) on Araliaceae, North America, Asia, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Muribasidiospora Kamat & Rajendren 1968, Exobasidiaceae, Exobasidiales, Exobasidiomycetes, three species, type species *M. indica* Kamat & Rajendren, plant parasites on Anacardiaceae and Ulmaceae, India, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2001, 2002, 2014, Wang et al. 2015c (taxonomy, phylogeny).

Murinicarpus B.K. Cui & Y.C. Dai 2019, Polyporaceae, Polyporales, Agaricomycetes, asexual morph uknown, two species, type species *M. subadustus* (Z.S. Bi & G.Y. Zheng) B.K. Cui & Y.C. Dai, China, sequence data available, see Cui et al. 2019 (taxonomy, phylogeny).

Muscinupta Redhead, Lücking & Lawrey 2009, *incertae sedis*, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *M. laevis* (Fr.) Redhead, Lücking & Lawrey, see Lawrey et al. 2009 (taxonomy), sequence data available, see Larsson et al. 2006 (phylogeny).

Musumecia Vizzini & Contu 2011, Pseudoclitocybaceae, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *M. bettlachensis* Vizzini & Contu, France, Italy, China, sequence data available, see Vizzini et al. 2011a (genus introduced), new spp. see Musumeci 2014 (Europe), Li et al. 2016b (China, Italy).

Mutinus Fr. 1849, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, 21 species, type species *M. caninus* (Huds.) Fr, terrestrial, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Giachini et al. 2010 (phylogeny, Gomphales), Degreef et al. 2013 (São Tomé), Trierveiler-Pereira et al. 2014a (Phallales, phylogeny), new spp. see da Silva et al. 2015 (Brazil), Crous et al. 2017b (Brazil).

Mycaureola Maire & Chemin 1922, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *M. dilseae* Maire & Chemin, marine, pathogen of the red alga, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2006 (evolution, phylogeny).

Mycena (Pers.) Roussel 1806 (= *Decapitatus* Redhead & Seifert 2000 *fide* Art. 59.1), Mycenaceae, Agaricales, Agaricomycetes, asexual morph previously known in *Decapitatus* Redhead & Seifert 2000, c. 600 species, type species *M. galericulata* (Scop.) Gray, saprotrophic, pathogenic, orchid mycorrhizae, worldwide, many species bioluminescent, see Desjardin et al. 2008a (bioluminescent fungus), Kirk et al. 2013 (genus accepted), Robich 2016 (Europe), sequence data available, see Harder et al. 2010 (Northern Europe, section *Calodontes*), Jaeger and Spiteller 2010 (compounds), Harder et al. 2013 (species complex), Park and Lee 2013 (symbiotic, *Gastrodia elata*), new spp. see Robich and Hausknecht 2008 (Austria), Aronsen 2009 (Norway), Boonpratuang 2009 (Thailand), Robich 2009 (Switzerland), Esteve-Raventos and Barrasa 2009 (Spain), Robich and Hausknecht 2009 (Mauritius), Desjardin et al. 2010 (Brazil, Malaysia, Puerto Rico), Aravindakshan and Manimohan 2011, 2012 (India, section *Polyadelphia*), Aronsen and Perry 2012 (Norway), Niveiro et al. 2012 (Argentina), Zamora and Català 2013 (Spain), Aravindakshan and Manimohan 2013a, b, c, 2014 (new section, section *Galactopoda*, section *Exornatae*, section *Longisetae*), Chew et al. 2014 (Malaysia, bioluminescent taxa), Shih et al. 2014 (China), Seok et al. 2015 (Korea), Perry and Desjardin 2016 (California, USA), Desjardin et al. 2016 (Brazil), Robich 2016 (Europe), Takahashi et al. 2016 (Japan), Miersch and Wilhelm 2017 (France), Wei and Kirschner 2019 (China).

Mycenastrum Desv. 1842, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, 18 species, type species *M. corium* (Guers.) Desv., gasteroid, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Jeppson 2008 (phylogeny), new spp. see Gurgel et al. 2017 (Brazil).

Mycenella (J.E. Lange) Singer 1938, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, ten species, type species *M. cyatheae* (Singer) Singer,

temperate, see Kirk et al. 2013 (genus accepted), sequence data available, see Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Osmundson et al. 2013 (DNA barcode).

Mycetinis Earle 1909, Omphalotaceae, Agaricales, Agaricomycetes, asexual morph unknown, 15 species, type species *M. alliaceus* (Jacq.) Earle ex A.W. Wilson & Desjardin, basidiomas of garlic smelling, saprophytic, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Petersen and Hughes 2017 (taxonomy).

Mycoacia Donk 1931, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 16 species, type species *M. fuscoatra* (Fr.) Donk, resupinate basidioma, hydnoid hymenophore, wood-inhabiting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Moreno et al. 2011 (phylogeny, Meruliaceae), Sjökvist et al. 2012 (phylogeny), new sp. see Yuan and Wan 2013 (morphology, China).

Mycoaciella J. Erikss. & Ryvarden 1978, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *M. bispora* (Stalpers) J. Erikss. & Ryvarden, resupinate basidioma, hydnoid hymenophore, wood-inhabiting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2004 (phylogeny, corticioid fungi), new combination see Hjortstam and Ryvarden 2009b (morphology).

Mycoalvimia Singer 1981, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *M. theobromicola* Singer, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accetped).

Mycoamaranthus Castellano, Trappe & Malajczuk 1992, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, three species, type species *M. auriorbis* Castellano, Trappe & Malajczuk, sequestrate, presumably ectomycorrhizal, Australia, Africa, Southeast Asia, some species edible (*M. cambodgensis*), see Lumyong et al. 2003, Kirk et al. 2013 (genus accepted), sequence data available, see Smith et al. 2015 (phylogeny).

Mycocalia J.T. Palmer 1961, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, seven species, type species *M. denudata* (Fr. & Nordholm) J.T. Palmer, worldwide, bird's nests fungi, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny et al. 2015 (taxonomy, dark-spored, phylogeny), new spp. see Crous et al. 2018b (morphology, phylogeny, Brazil).

Mycocryptococcus Pollacci & Nann. 1927, Tremellaceae, Tremellales, Tremellomycetes, asexual morph unknown, one species, type species *M. copellii* Pollacci & Nann., yeast, worldwide, sequence data unavailable, see Kirk et al. 2008.

Mycogloea L.S. Olive 1950, *incertae sedis*, Agaricostilbales, Agaricostilbomycetes, seven species, type species *M. carnosa* L.S. Olive, yeast stage described as *Kurtzmanomyces*, mycoparasitic (mostly on Ascomycota), North America, Japan, Thailand, sequence data available, the genus is most likely polyphyletic, see Bauer et al. 2009 (phylogeny), Wang et al. 2015d, e (phylogeny, yeast).

Mycoleptodonoides Nikol. 1952, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, four species, type species *M. vassiljevae* Nikol., hydnoid hymenophore, wood-rotting, widespread (Asia), see Kirk et al. 2013 (genus accepted), some species edible (*M. aitchisonii* (Berk.) Maas Geest.), see Dai et al. 2010b (edible mushrooms, China), Choi et al. 2016b (compounds), sequence data available, see Justo et al. 2017 (phylogeny, Polyporales), new spp. see Yuan and Dai 2009a (morphology, China), Das et al. 2013b (phylogeny, morphology, India).

Mycolevis A.H. Sm. 1965, Albatrellaceae, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *M. siccigleba* A.H. Sm., terrestrial, North America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Mycopan Redhead, Moncalvo & Vilgalys 2013, Mycenaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *M. scabripes* (Murrill) Redhead, Moncalvo & Vilgalys, basidioma mycenoid, sordid, on plant debris, sequence data unavailable, see Redhead 2013a (taxonomy).

Mycorrhaphium Maas Geest. 1962, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, six species, type species *M. adustum* (Schwein.) Maas Geest., hydnoid hymenophore, terrestrial, widespread (USA, Europe, Africa, China), see Kirk et al. 2013 (genus accepted), Tervonen et al. 2015 (redescription of *M. pusillum*), Zmitrovich 2018a (taxonomy), sequence data available, see Miettinen et al. 2012 (phylogeny), Yuan 2014 (phylogeny, *Antrodiella,* China), new sp. see Yuan and Dai 2009b (morphology, China).

Mycorrhaphoides Hembrom, K. Das & Hallenb. 2017, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *M. stalpersii* Hembrom, Nilsson, A. Parihar, K. Das, A. Baghela & S.K. Singh, wood-rotting, India, sequence data available, see Hembrom et al. 2017b (taxonomy, China).

Mycosarcoma Bref. 1912, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, five species, type species *M. maydis*, plant parasite (flowers) on Poaceae, widespread, saprotrophic yeast on plants, cultures available, sequence data available, see McTaggart et al. 2016c (taxonomy).

Mycospongia Velen. 1939, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *M. juniperi* Velen., sequence data unavailable, see Kirk et al. 2008.

Mycostigma Jülich 1976, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, one species, type

species *M. aegeritoides* (Bourdot & Galzin) Jülich, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Mycostilla Spirin & V. Malysheva 2018, *incertae sedis*, Auriculariales, Agaricomycetes, monotypic, type species *M. vermiformis* (Berk. & Broome) Spirin & V. Malysheva (previously *Dacrymyces vermiformis*), temperate European forests, sequence data available, see Spirin et al. 2019a (genus introduced, phylogeny).

Mycosyrinx Beck 1894, Mycosyringaceae, Urocystidales, Ustilaginomycetes, asexual morph unkown, four species, type species *M. cissi* (DC.) Beck, plant parasites (branches) on *Cissus* spp. (Vitaceae), America, Asia, Africa, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014, Nasr et al. 2014a (taxonomy).

Mycothele Jülich 1976, Gloeophyllaceae, Gloeophyllales, Agaricomycetes, asexual morph unknown, one species, type species *M. disciformis* (G. Cunn.) Jülich, New Zealand, sequence data unavailable, see Kirk et al. 2013 (genus accetped).

Mylittopsis Pat. 1895, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, one species, type species *M. langloisii* Pat., USA, Malaysia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Myochromella V. Hofst., Clémençon, Moncalvo & Redhead 2015, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *M. inolens* (Fr.) V. Hofstetter, Clémençon, Moncalvo & Redhead, worldwide, basidioma agarioid, solitary, gregarious or occasionally paired (notcaespitose), sequence data available, see Hofstetter et al. 2014 (phylogeny, Lyophyllaceae), Bellanger et al. 2015 (phylogeny).

Myriococcum Fr. 1823, *incertae sedis*, *incertae sedis*, Agaricomycetes, one species, type species *M. praecox* Fr., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Koukol 2016 (phylogeny).

Myriostoma Desv. 1809, Geastraceae, Geastrales, Agaricomycetes, asexual morph unknown, four species, type species *M. anglicum* Desv. [current name: *M. coliforme* (Dicks.) Corda], widespread, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Sousa et al. 2017 (hidden species within *M. coliforme*).

Myriothele Nakasone 2013, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *M. philippiae* (Boidin & Gilles) Nakasone, hydnoid hymenophore, see Nakasone et al. 2013 (morphology), wood-rotting, Réunion, sequence data available, see Wu et al. 2007 (phylogeny), Nakasone 2013 (new genus, new combination, morphology, *Epithele*), Justo et al. 2017 (phylogeny, Polyporales).

Mythicomyces Redhead & A.H. Sm. 1986, Mythicomycetaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *M. corneipes* (Fr.) Redhead & A.H. Sm., North temperate, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny et al. 2006 (phylogeny), Vizzini et al. 2019 (phylogeny).

Myxariellum Spirin & V. Malysheva 2019, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, two species, type species *M. concinnum* Spirin & V. Malysheva, North America (United States, Washington); on rotten wood of *Thuja*, sequence data available, see Spirin et al. 2019b (taxonomy, phylogeny).

Myxarium Wallr. 1833, Hyaloriaceae, Auriculariales, Agaricomycetes, asexual morph unknown, 14 species, type species *M. nucleatum* Wallr., wood-decaying, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Weiß and Oberwinkler 2001 (taxonomy and phylogeny), Spirin et al. 2018a, 2019b (taxonomy, phylogeny, new spp.)

Myxomphalia Hora 1960, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. two species, type species *M. maura* (Fr.) Hora, North temperate, see Kirk et al. 2013 (genus accepted), sequence data available, see Antonín 1999 (type revision), Moncalvo et al. 2002 (phylogeny), Antonín and Noordeloos 2004 (Europe).

Naematelia Fr. 1818, Naemateliaceae, Tremellales, Tremellomycetes, sexual and asexual morphs known, four species, type species *N. encephala* (Pers.) Fr., mycoparasitic, worldwide, cultures and sequence data available, see Liu et al. 2015b (taxonomy, phylogeny).

Naganishia S. Goto 1963, Filobasidiaceae, Filobasidiales, Tremellomycetes, sexual morph unknown, 17 species, type species *N. globosa* Goto, yeast, worldwide, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny), new spp. see Fotedar et al. 2018 (Qatar).

Naiadolina Redhead, Labbé & Ginns 2013, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *N. flavomerulina* (Redhead) Redhead, H. Labbé & Ginns, worldwide, sequence data available, see Redhead and Ginns 2013 (taxonomy), Hao et al. 2014 (phylogeny).

Nannfeldtiomyces Vánky 1981, Doassansiaceae, Doassansiales, Exobasidiomycetes, asexual morph unknown, two species, type species *N. sparganii* (Lagerh.) Vánky, plant parasites on leaves of Sparganiaceae, Asia, Europe, North America, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014 (taxonomy).

Nanstelocephala Oberw. & R.H. Petersen 1990, Crepidotaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *N. physalacrioides* Oberw. & R.H. Petersen, USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Naohidea Oberw. 1990, Naohideaceae, Naohideales, Cystobasidiomycetes, yeast stage known, one species, type

species *N. sebacea* (Berk. & Broome) Oberw., gelatinous basidiocarps, mycoparasitic, Asia, Europe and North America, see Piątek 2002 (notes on distribution, Poland), Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Aime et al. 2006 (phylogeny), Bauer et al. 2006 (phylogeny, simple-septate basidiomycetes), Aime et al. 2014 (phylogeny), Wang et al. 2015e (phylogeny, taxonomy).

Naohidemyces S. Sato, Katsuya & Y. Hirats. 1993, Pucciniastraceae, Pucciniales, Pucciniomycetes, two species, type species *N. vaccinii* (Jørst.) S. Sato, Katsuya & Y. Hirats. ex Vanderweyen & Fraiture, biotrophic on *Vaccinium* (Ericaceae) and *Tsuga* (Pinaceae, alternate host), terrestrial, see Vanderweyen and Fraiture 2009 (validated *N. vaccinii*), Kirk et al. 2013 (genus accepted), sequence data available, see Aime 2006 (phylogeny).

Narasimhania Thirum. & Pavgi 1952, Doassansiaceae, Doassansiales, Exobasidiomycetes, one species, type species *N. alismatis* Pavgi & Thirum., plant parasites on leaves of Alismataceae, Africa, South America, South Asia, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy, phylogeny).

Naucoria (Fr.) P. Kumm. 1871 (= *Alnicola* Kühner 1926), Hymenogastraceae, Agaricales, Agaricomycetes, asexual morph unknown, 30 species, type species *N. escharioides* (Fr.) P. Kumm., worldwide, see Henrici 2008 (Britain, keys), Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Larsson et al. 2009b (phylogeny).

Navisporus Ryvarden 1980, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, eight species, type species *N. floccosus* (Bres.) Ryvarden, poroid hymenophore, wood-rotting, widespread (pantropical), see Kirk et al. 2013 (genus accepted), sequence data available, see Vlasák et al. 2012 (USA), new spp. see Ryvarden 2018a (morphology, Cameroon, Central African Republic).

Necator Massee 1898, Corticiaceae, Corticiales, Agaricomycetes, sexual morph *Erythricium*, one species, type species *N. decretus* Massee, Southeast Asia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Neoalbatrellus Audet 2010, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, four species, type species *N. caeruleoporus* (Peck) Audet, poroid hymenophore, wood-decaying, ectomycorrhizal, worldwide, on soil, see Audet 2010 (taxonomy), sequence data available, see Audet and Luther 2016 (new sp., phylogeny, North America), Chen et al. 2017e (new sp., phylogeny, China).

Neoaleurodiscus Sheng H. Wu 2010, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, two species, type species *N. fujii* Sheng H. Wu 2010, wood-rotting, Japan, sequence data available, see Wu et al. 2010b (genus introduced).

Neoalpova Vizzini 2014, Paxillaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *N. rubescens* (Vittad.) Vizzini, sequence data unavailable, see Vizzini 2014a (taxonomy).

Neoantrodia Audet 2017, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, 13 species, type species *N. serialis* (Fr.) Audet, wood-rotting, sequence data available, see Ortiz-Santana et al. 2013 (antrodia clade of Polyporales, phylogeny), Spirin et al. 2016a (phylogeny, *Antrodia s. s.*), Han et al. 2016a (brown-rot fungi, phylogeny, new genera, *Fomitopsis*).

Neoantrodiella Y.C. Dai, B.K. Cui, Jia J. Chen & H.S. Yuan 2015, Neoantrodiellaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, two species, type species *N. gypsea* (Yasuda) Y.C. Dai, B.K. Cui, Jia J. Chen & H.S. Yuan, sequence data available, see Ariyawansa et al. 2015 (taxonomy).

Neoboletus Gelardi, Simonini & Vizzini 2014, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, eleven species, type species *N. luridiformis* (Rostk.) Gelardi, Simonini & Vizzini, mostly stipitate-pileate, ectomycorrhizal, both edible (*N. erythropus*, Boa 2004) and poisonous species(*N. venenatus*, Matsuura et al. 2007), Europe, North America, Asia, sequence data available, see Wu et al. 2014b (phylogeny).

Neoburgoa Diederich, E. Zimm. & Lawrey 2016, Hydnaceae, Cantharellales, Agaricomycetes, only asexual morph known (bulbil-forming), one species, type species *N. freyi* Diederich, Zimmermann & Lawrey, lichenicolous, widespread in the Alps, Russia, see Zhurbenko and Pino-Bodas 2017 (revision, lichenicolous fungi growing on *Cladonia*), sequence data available, see Lawrey et al. 2016 (taxonomy, phylogeny).

Neocampanella Nakasone, Hibbett & Goranova 2009, Marasmiaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *N. blastanos* (Boidin & Gilles) Nakasone, Hibbett & Goranova, lignicolous, Central African Republic, China, Mauritius, USA, basidioma corticioid, sequence data available, see Nakasone et al. 2009 (taxonomy).

Neoclitocybe Singer 1962, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, eleven species, type species *N. byssiseda* (Bres.) Singer, worldwide, see Kirk et al. 2013 (genus accepted), sequence data unavailable, new spp. see Sá et al. 2016 (Brazil).

Neodatronia B.K. Cui, Hai J. Li & Y.C. Dai 2014, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *N. gaoligongensis* B.K. Cui, Hai J. Li & Y.C. Dai, poroid hymenophore, wood-rotting, China, sequence data available, see Li et al. 2014b (phylogeny, monograph, China).

Neodictyopus Palacio, Robledo, Reck & Drechsler-Santos 2017, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *N. atlanticae* Palacio, Robledo & Drechsler-Santos, sequence data available Palacio et al. 2017 (taxonomy).

Neofavolus Sotome & T. Hatt. 2013, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, four species, type species *N. alveolaris* (DC.) Sotome & T. Hatt., poroid hymenophore, wood-rotting, widespread (temperate), sequence data available, see Sotome et al. 2013 (new sp., new combinations, phylogeny), Seelan et al. 2015 (new combination, phylogeny), Zmitrovich and Kovalenko 2016 (phylogeny), Zmitrovich 2018a (taxonomy).

Neofomitella Y.C. Dai, Hai J. Li & Vlasák 2014, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *N. rhodophaea* (Lév.) Y.C. Dai, Hai J. Li & Vlasák, pileate basidioma, poroid hymenophore, wood-rotting, widespread (Asia), sequence data available, see Li et al. 2014c (taxonomy, phylogeny, China).

Neohygrocybe Herink 1958, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *N. ovina* (Bull.) Herink, worldwide, two sections: sect. *Neohygrocybe* Herink 1958 and sect. *Tristes* (Bataille) Lodge & Padamsee 2013, worldwide, sequence data available, see Babos et al. 2011 (phylogeny), Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae).

Neolentinus Redhead & Ginns 1985, Gloeophyllaceae, Gloeophyllales, Agaricomycetes, asexual morph unknown, 14 species, type species *N. kauffmanii* (A.H. Sm.) Redhead & Ginns, wood-rotting, widespread, brown rot (*N. lepideus*), see Kirk et al. 2013 (genus accepted), some species edible (*N. lepideus* (Fr.) Redhead & Ginns), see Dai et al. 2010b (edible mushrooms, China), Jang et al. 2010 (cultivation), some species medicinal use (*N. adhaerens* (Alb. & Schwein.) Redhead & Ginns), see Dai and Yang 2008 (medicinal mushrooms, China), sequence data available, see Garcia-Sandoval et al. 2011 (phylogeny), Nagy et al. 2015 (evolution, genome), Zmitrovich and Kovalenko 2016 (phylogeny, new combinations), Vlasenko et al. 2017 (Novosibirsk, new record).

Neolentiporus Rajchenb. 1995, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *N. maculatissimus* (Lloyd) Rajchenb., poroid hymenophore, wood-rotting, brown rot, widespread (South America, Australia), see Kirk et al. 2013 (genus accepted), sequence data available, see Pildain and Rajchenberg 2013 (phylogeny, *Postia s. l.*, Argentina).

Neolysurus O.K. Mill., Ovrebo & Burk 1991, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *N. arcipulvinus* O.K. Mill., Ovrebo & Burk, terrestrial, Costa Rica, sequence data unavailable, see Kirk et al. 2013 (genus accetped).

Neomensularia F. Wu, L.W. Zhou & Y.C. Dai 2016, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, four species, type species *N. duplicata* F. Wu, L.W. Zhou & Y.C. Dai, wood-rotting, sequence data available, see Wu et al. 2016a (taxonomy), new spp. see Ji and Wu 2017b (China).

Neonothopanus R.H. Petersen & Krisai 1999, Omphalotaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *N. nambi* (Speg.) R.H. Petersen & Krisai, see Kirk et al. 2013 (genus accepted), some species bioluminescent (*N. nambi* (Speg.) R.H. Petersen & Krisai), on tree base, Australia, South America, Central America, Malaysia, sequence data available, see Chew et al. 2015 (Malaysia, phylogeny, bioluminescent fungi), new combinations, see Capelari et al. 2011,

Neopaxillus Singer 1948, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *N. echinospermus* (Speg.) Singer, America, see Kirk et al. 2013 (genus accepted), Watling and Aime 2013 (monograph), sequence data available, new spp. see Vizzini et al. 2012a (Dominican Republic).

Neosecotium Singer & A.H. Sm. 1960, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *N. macrosporum* (Lloyd) Singer & A.H. Sm., America, Africa, sequence data unavailable, see Lizárraga et al. 2012 (Brazil), Kirk et al. 2013 (genus accepted).

Neotremella Lowy 1979, *incertae sedis*, Tremellales, Tremellomycetes, asexual morph unknown, one species, type species *N. guzmanii* Lowy, wood-decaying, North America, Mexico, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Neotyphula Wakef. 1934, *incertae sedis*, *incertae sedis*, *incertae sedis*, Basidiomycota, asexual morph unknown, one species, type species *N. guianensis* Wakef., Guyana, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Neovossia Körn. 1879, Tilletiaceae, Tilletiales, Exobasidiomycetes, one species, type species *N. moliniae* (Thüm.) Körn., plant parasite (ovaries) on Poaceae, Europa, Asia, North America, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Newinia Thaung 1973, Phakopsoraceae, Pucciniales, Pucciniomycetes, three species, type species *N. heterophragmatis* Thaung, biotrophic on Bignoniaceae, terrestrial, Nigeria, Myanmar, Thailand, sequence data unavailable, see Kirk et al. 2013 (genus accetped).

Nia R.T. Moore & Meyers 1961, Niaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *N. vibrissa* R.T. Moore & Meyers, worldwide,

marine, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2001 (*N. vibrissa*, phylogeny), Yamaguchi et al. 2009 (phylogeny).

Nidula V.S. White 1902, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *N. candida* (Peck) V.S. White, worldwide, bird's nests fungi, see Kirk et al. 2013 (genus accepted), sequence data available, see Zhao et al. 2017c (phylogeny), new spp. see Das and Zhao 2013 (India), Poinar 2014 (fossil).

Nidularia Fr. 1817, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *N. deformis* (Willd.) Fr., worldwide, bird's nests fungi, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny and Griffith 2010 (phylogeny).

Nidulariopsis Greis 1935, Geastraceae, Geastrales, Agaricomycetes, asexual morph unknown, two species, type species *N. melanocarpa* Greis, Europe, North America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Nielozyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Bulleribasidiaceae, Tremellales, Tremellomycetes, sexual morph unknown, two species, type species *N. melastomae* (Nakase, Tsuzuki, F.L. Lee & M. Takash.) X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, Asia, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Niemelaea Zmitr., Ezhov & Khimich 2015, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *N. consobrina* (Bres.) Zmitr., Ezhov & Khimich, poroid hymenophore, wood-rotting, widespread, sequence data available, see Tomšovský et al. 2010b (phylogeny, *Ceriporiopsis*), new combinations see Zmitrovich et al. 2015 (taxonomy, Russia, China), Papp 2016 (*N. balaenae*), Zmitrovich 2018a (taxonomy).

Nigroboletus Gelardi, Vizzini, E. Horak, T.H. Li & Ming Zhang 2015, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *N. roseonigrescens* Gelardi, Vizzini, E. Horak, T.H. Li & Ming Zhang, stipitate-pileate, China, sequence data available, see Gelardi et al. 2015b (taxonomy, phylogeny).

Nigrohydnum Ryvarden 1987, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *N. nigrum* Ryvarden, pileate basdiome, hymenophore hydnoid to lamellate, wood-rotting, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted), Robledo and de Mello Gugliotta 2013 (morphology, distribution).

Nigrofomes Murrill 1904, Nigrofomitaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, three species, type species *N. melanoporus* (Mont.) Murrill, wood-rotting, worldwide, sequence data available, see Zhou et al. 2018 (accepted Nigrofomitaceae, phylogeny, taxonomy).

Nigroporus Murrill 1905, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *N. vinosus* (Berk.) Murrill, poroid hymenophore, wood-rotting, widespread (pantropical), see Kirk et al. 2013 (genus accepted), sequence data available, see Miettinen et al. 2012 (phylogeny), Binder et al. 2013 (phylogeny, Polyporales).

Niveoporofomes B.K. Cui, M.L. Han & Y.C. Dai 2016, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *N. spraguei* (Berk. & M.A. Curtis) B.K. Cui, M.L. Han & Y.C. Dai, widespread (temperate), annual pileate basidioma, poroid hymenophore, wood-rotting, brown rot, sequence data available, see Han et al. 2016a (new combination, phylogeny, morphology).

Nochascypha Agerer 1983, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *N. filicina* (P. Karst.) Agerer, South America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Nothocastoreum G.W. Beaton 1984, Mesophelliaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, one species, type species *N. cretaceum* (Lloyd) G.W. Beaton, Australia, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006 (phylogeny, phylogeography).

Nothocorticium Gresl. & Rajchenb. 1999, *incertae sedis*, Corticiales, Agaricomycetes, asexual morph unknown, one species, type species *N. patagonicum* Gresl. & Rajchenb., Argentina, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Notholepista Vizzini & Contu 2012, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *N. subzonalis* (Peck) Vizzini & Contu, worldwide, on the ground, never on wood, sequence data available, see Vizzini et al. 2012b (taxonomy).

Nothophellinus Rajchenb. & Pildain 2015, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *N. andinopatagonicus* (J.E. Wright & J.R. Deschamps) Rajchenb. & Pildain, proposed to accommodate *Phellinus andinopatagonicus*, wood-rotting, white rot, Argentina, Chile, sequence data available, see Rajchenberg et al. 2015 (poroid Hymenochaetaceae).

Nothoravenelia Dietel 1910, Phakopsoraceae, Pucciniales, Pucciniomycetes, three species, type species *N. japonica* Dietel, biotrophic on Burseraceae, Euphorbiaceae, terrestrial, Malawi, Japan, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Nyssopsora Arthur 1906 (= *Oplophora* Syd. 1921), Raveneliaceae, Pucciniales, Pucciniomycetes, eleven

species, type species *N. echinata* (Lév.) Arthur, biotrophic, terrestrial on Anacardiaceae, Apiaceae, Araliaceae, Meliaceae, Pittosporaceae, Sapindaceae, Asia, Australia, Europe, North America, central America (Panama), see Kirk et al. 2013 (genus accepted), sequence data available, see Baiswar et al. 2014 (identification), new spp. see de Carvalho et al. 2014 (Panama).

Obba Miettinen & Rajchenb. 2012, Gelatoporiaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *O. valdiviana* (Rajchenb.) Miettinen & Rajchenb., resupinate basidioma, poroid hymenophore, wood-rotting, white rot, widespread (subtropics to boreal zone), sequence data available, see Miettinen and Rajchenberg 2012 (taxonomy, phylogeny), Miettinen et al. 2016b (draft genome, *O. rivulosa*), Zmitrovich 2018a (taxonomy).

Oberwinkleria Vánky & R. Bauer 1995, Tilletiaceae, Tilletiales, Exobasidiomycetes, one species, type species *O. anulata* Vánky & C. Vánky, plant parasite (ovaries) on *Ortachne* spp. (Poaceae), Venezuela, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014 (taxonomy).

Oberwinklerozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, *incertae sedis*, *incertae sedis*, Microbotryomycetes, sexual morph unknown, three species, type species *O. yarrowii* (Á. Fonseca & Uden) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, worldwide, cultures and sequence data available, see Wang et al. 2015e (taxonomy, phylogeny).

Occultifur Oberw. 1990, Cystobasidiaceae, Cystobasidiales, Cystobasidiomycetes, all species are able to develop a yeast stage or are only known as yeast (*O. brasiliensis* and *O. tropicalis*), c. nine species (probably an underestimation as some species were recently discovered as yeast stages from very different habitats), type species *O. internus* (L.S. Olive) Oberw., ecological strategies variable, mycoparasitic, endophytic, epiphytic or soil yeasts, worldwide, Kurtzman et al. 2011 (taxonomy), sequence data available, see Aime et al. 2006 (phylogeny), Bauer et al. 2006 (phylogeny, simple-septate basidiomycetes), Aime et al. 2014 (phylogeny), Wang et al. 2015e (phylogeny, yeast), new spp. see Gomes et al. 2015 (Brazil), Kurtzman and Robnett 2015 (USA), Khunnamwong et al. 2015 (Thailand, Brazil), Khunnamwong et al. 2017, Šibanc et al. 2018 (Slovenia),

Ochropsora Dietel 1895, Uropyxidaceae, Pucciniales, Pucciniomycetes, three species, type species *O. sorbi* Dietel, biotrophic on Ranunculaceae (alternate host), Araliaceae, Elaeagnaceae, Rosaceae, terrestrial, Europe, Japan, see Kirk et al. 2013 (genus accepted), sequence data available, see Van der Merwe et al. 2007 (phylogeny).

Octaviania Vittad. 1831, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 40 species, type species *O. asterosperma* Vittad., basidiomas sequestrate, ectomycorrhizal, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Orihara et al. 2012b (phylogeny, new spp., Japan), Choeyklin et al. 2012 (Thailand), Cabero et al. 2013 (Spain).

Odonticium Parmasto 1968, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, seven species, type species *O. romellii* (S. Lundell) Parmasto, worldwide, sequence data available, see Larsson et al. 2006 (phylogeny), Miettinen et al. 2012 (phylogeny).

Odontiochaete Rick 1940, *incertae sedis*, Cantharellales, Agaricomycetes. asexual morph unknown, one species, type species *O. alba* Rick, Host-Substratum Brazilwood, genus in need of modern interpretation, sequence data unavailable, see Kirk et al. 2008.

Odontiopsis Hjortstam & Ryvarden 1980, Schizoporaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, two species, type species *O. hyphodontina* Hjortstam & Ryvarden, wood-rotting, widespread, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Odontoefibula C.C. Chen & Sheng H. Wu 2018, Phanerochaetaceae, Polyporales, Agaricomycetes, one species, type species *O. orientalis* C.C. Chen & Sheng H. Wu, see Chen et al. 2018 (phylogeny, taxonomy).

Odoria V. Papp & Dima 2017, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *O. alborubescens* (Bourdot & Galzin) V. Papp & Dima, poroid hymenophore, wood-rotting, white rot, Europe, sequence data available, see Papp and Dima 2018 (new genus, new combination, phylogeny, type study), Zmitrovich 2018a (taxonomy).

Ofella Spirin & V. Malysheva 2019, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *O. glaira* (Lloyd) Spirin & V. Malysheva, Europe (Estonia, Finland, Norway, Sweden), on strongly rotten wood of conifers (*Picea*, *Pinus*), sequence data available, see Spirin et al. 2019b (taxonomy, phylogeny).

Oligoporus Bref. 1888, Dacryobolaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 15 species, type species *O. farinosus* Bref. [current name: *O. rennyi* (Berk. & Broome) Donk], poroid hymenophore, wood-rotting, brown rot, widespread, sequence data available, see Binder et al. 2013 (phylogeny, Polyporales), new spp. see Ryvarden 2018a (new combination, morphology, Ethiopia, Malawi), new combinations, see Kotiranta et al. 2009 (nomenclature), Ryvarden and Melo 2014 (morphology), Vlasák et al. 2016 (morphology, Costa Rica), Huckfeldt and Schmidt 2017 (building-rot, Germany), Ryvarden et al. 2017 (morphology).

Olivea Arthur 1917 (= *Tegillum* Mains 1940), Chaconiaceae, Pucciniales, Pucciniomycetes, eight species, type

species *O. capituliformis* (Henn.) Arthur, biotrophic, terrestrial on Euphorbiaceae, Lamiaceae, Sapotaceae, Verbenaceae, circumglobal in tropical regions, sequence data available, see Aime 2006 (phylogeny).

Oliveonia Donk 1958, Oliveoniaceae, Cantharellales, Agaricomycetes, asexual morph *Oliveorhiza* P. Roberts 1993, five species, type species *O. fibrillosa* (Burt) Donk, widespread, see Kirk et al. 2013 (genus accepted), sequence data available.

Omphaliaster Lamoure 1971, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, seven species, type species *O. borealis* (M. Lange & Skifte) Lamoure, North temperate, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny).

Omphalina Quél. 1886, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. 50 species, type species *O. pyxidata* (Bull.) Quél., worldwide, some species lichen-forming, see Palice et al. 2005 (*O. foliacea*), Kirk et al. 2013 (genus accepted), sequence data available, see Moreno et al. 2007 (*O. giovanellae*), Hartley et al. 2009 (phylogeny), Vizzini et al. 2012d (Italy), Osmundson et al. 2013 (DNA barcode), Zvyagina et al. 2015 (*O. discorosea*).

Omphalotus Fayod 1889 (= *Lampteromyces* Singer 1947), Omphalotaceae, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *O. olearius* (DC.) Singer, worldwide, some species bioluminescent, Jack o'Lantern mushroom (*O. olearius* (DC.) Singer), on wood, see Desjardin et al. 2008a (bioluminescent fungus), Kirk et al. 2013 (genus accepted), sequence data available, Wawrzyn et al. 2012 (genome), see Yang and Feng 2013 (China).

Onnia P. Karst. 1889, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, eight species, type species *O. circinata* (Fr.) P. Karst., wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Zhou 2015b (*Cylindrosporus flavidus* gen. et comb. nov. segregated from *Onnia*), new spp. see Ji et al. 2017d (global diverisity, phylogeny, species on gymnosperms).

Orphanomyces Savile 1974, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, three species, type species *O. arcticus* (Rostr.) Savile, plant parasites (leaves) on *Carex* spp. (Cyperaceae), Europe, Asia, North America, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014 (taxonomy, phylogeny).

Osmoporus Singer 1944, Gloeophyllaceae, Gloeophyllales, Agaricomycetes, asexual morph unknown, two species, type species *O. odoratus* (Wulfen) Singer, wood-decaying, sequence data available, new combination see He et al. 2014.

Ossicaulis Redhead & Ginns 1985, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *O. lignatilis* (Pers.) Redhead & Ginns, North temperate, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Holec and Kolařík 2013b (*O. lachnopus*), Hofstetter et al. 2014 (phylogeny, Lyophyllaceae).

Osteina Donk 1966, Dacryobolaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *O. obducta* (Berk.) Donk, poroid basidioma, wood-rotting, brown rot, widespread (Northern Hemisphere), sequence data available, see Cui et al. 2014 (phylogeny, distribution), Zmitrovich 2018a (taxonomy).

Osteomorpha G. Arnaud ex Watling & W.B. Kendr. 1979, Hydnaceae, Cantharellales, Agaricomycetes, possibly asexual morph of *Trechispora* P. Karst. 1890, see Melnik 2011 (new record, Russia), one species, type species *O. fragilis* G. Arnaud ex Watling & W.B. Kendr., saprobes, terrestrial, genus in need of modern interpretation, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Oudemansiella Speg. 1881, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 20 species, type species *O. platensis* (Speg.) Speg., four sections: sect. *Dactylosporina* (Clémençon) Pegler & T.W.K.Young, sect. *Mucidula* (Pat.) Zhu L. Yang, Li F. Zhang, G.M. Muell., G. Kost & Rexer, sect. *Oudemansiella* and sect. *Radicatae* Clémençon, worldwide, some species edible (*O. canarii* (Jungh.) Höhn.), see Dai et al. 2010b (Chinese edible mushrooms), Kirk et al. 2013 (genus accepted), Xu et al. 2016a (cultivation), sequence data available, see Liu et al. 2009 (Thailand), Yang et al. 2009 (systematic arrangement), Petersen and Hughes 2010 (monograph), Wartchow 2014 (new combination).

Oxychaete Miettinen 2016, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *O. cervinogilva* (Jungh.) Miettinen, wood-rotting, sequence data available, see Miettinen et al. 2016a (polypores, Phanerochaetaceae), Zmitrovich 2018a (taxonomy).

Oxyporus (Bourdot & Galzin) Donk 1933, Oxyporaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, 18 species, type species *O. populinus* (Schumach.) Donk, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Zmitrovich and Malysheva 2014 (phylogeny), new spp. see Cui and Dai 2009 (China), Ryvarden and Iturriaga 2010 (Neotropical polypores), Hofm anad Ryvarden 2012 (Panama).

Pachnocybe Berk. 1836, Pachnocybaceae, Pachnocybales, Pucciniomycetes, one species, type species *P. ferruginea* Berk., Europe, in wood, see Kirk et al. 2013 (genus accepted), sequence data available, see Henk and Vilgalys 2007 (phylogeny), Vu et al. 2019 (DNA sequences).

Pachykytospora Kotl. & Pouzar 1963, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, four species, type species *P. tuberculosa* (Fr.) Kotl. & Pouzar, the genus was treated as a synonym of *Haploporus* Bondartsev & Singer 1944 *fide* Shen et al. 2016, poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2013 (phylogeny, Polyporales).

Pachylepyrium Singer 1958, Tubariaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. fulvidula* (Singer) Singer (clustered in Tubariaceae according to Matheny et al. 2015), North temperate, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny et al. 2015 (phylogeny).

Pagidospora Drechsler 1960, *incertae sedis*, *incertae sedis*, Agaricomycetes, sexual morph unknown, one species, type species *P. amoebophila* Drechsler, USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Palaeocephala Singer 1962, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. cymatelloides* (Dennis & D.A. Reid) Singer, Sierra Leone, sequence data unavailable, see Antonín 2007 (Africa, monograph), Kirk et al. 2013 (genus accepted).

Panaeolina Maire 1933, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *P. foenisecii* (Pers.) Maire, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny et al. 2006 (phylogeny).

Panaeolopsis Singer 1969, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *P. sanmartiniana* Singer, worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Panaeolus (Fr.) Quél. 1872, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, 15 species, type species *P. papilionaceus* (Bull.) Quél., asexual morph unknown, worldwide, saprotrophic, on soil or dung, see Kirk et al. 2013 (genus accepted), Dulay et al. 2015 (compounds), sequence data available, see Walther et al. 2005 (phylogeny), Matheny et al. 2006 (phylogeny), Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Osmundson et al. 2013 (DNA baorcode), new spp. see Hausknecht and Krisai-Greilhuber 2009 (Austria, morphology), Kaur et al. 2014a (India).

Panellus P. Karst. 1879, Mycenaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 55 species, type species *P. stipticus* (Bull.) P. Karst., some species bioluminescent (*P. luminescens* (Corner) Corner, Gdns' Bull., *P. stipticus* (Bull.) P. Karst. 1879), edible Mukitake (*P. serotinus* (Pers.) Kühner), see Desjardin et al. 2008a (bioluminescent fungus), Dai et al. 2010b (edible mushrooms, China), Inoue et al. 2013 (medicinal study), Kirk et al. 2013 (genus accepted), Cortés-Pérez et al. 2017 (Mexico), sequence data available, see Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Osmundson et al. 2013 (DNA barcode), new spp. see Chew et al. 2015 (Malaysia, phylogeny, bioluminescent fungi).

Panus Fr. 1838, Panaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 20 species, type species *P. conchatus* (Bull.) Fr, wood-rotting, widespread, some species medicinal use (*P. conchatus* (Bull.) Fr.), see Dai and Yang 2008 (medicinal mushrooms, China), Kirk et al. 2013 (genus accepted), Sanuma et al. 2016 (edible mushrooms, Brazil), sequence data available, see Vargas-Isla et al. 2015 (mating studies, morphology, phylogeny), new spp. see Drechsler-Santos et al. 2012b (Brazil), Njouonkou et al. 2013 (Cameroon), Tibpromma et al. 2017 (Thailand), Zmitrovich et al. 2018a (Russia).

Papiliotrema J.P. Samp., M. Weiss & R. Bauer 2002, Rhynchogastremaceae, Tremellales, Tremellomycetes, sexual and asexual morphs known, 30 species, type species *P. bandonii* J.P. Samp., Gadanho, M. Weiss & R. Bauer, yeast, mycoparasite, widespread, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny), new spp. see Into et al. 2018 (Thailand, French Guiana), Yurkov and Kurtzman 2019 (USA).

Pappia Zmitr. 2018, Meruliaceae, Polyporales, Agaricomycetes, asexual morph chlamydosporic, one species, type species *P. fissilis* (Berk. & M.A. Curtis) Zmitr., tyromycetoid basidioma, wood-rotting, white rot, widespread, sequence data available, see Zmitrovich 2018a (taxonomy).

Papyrodiscus D.A. Reid 1979, *incertae sedis*, Corticiales, Agaricomycetes, asexual morph unknown, one species, type species *P. ferrugineus* D.A. Reid, Papua New Guinea, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Paragymnopus J.S. Oliveira 2019, Omphalotaceae, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *P. perforans* (Hoffm.) J.S. Oliveira, worldwide, sequence data available, see Oliveira et al. 2019 (phylogeny, taxonomy).

Paragyrodon (Singer) Singer 1942, Paxillaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *P. sphaerosporus* (Peck) Singer, North America, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2010 (phylogeny).

Parahaplotrichum W.A. Baker & Partr. 2001, Thelephoraceae, Thelephorales, Agaricomycetes, asexual morph unknown, one species, type species *P. idahoense* W.A. Baker & Partr., North America, wood-decaying, sequence data unavailable, see Kirk et al. 2008.

Parajaminaea T. Kij. & Aime 2017, *incertae sedis*, Microstromatales, Exobasidiomycetes, two species, type species *P. albiziae* (Syd. & P. Syd.) Kijporn. & Aime, plant parasite (leaves) on *Albizia* (Fabaceae), Africa, saprobic

yeast state vectored by birds, cultures available, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (phylogenetic classification of yeasts, Ustilaginomycotina), Kijpornyongpan and Aime 2017 (description).

Paralepistopsis Vizzini 2012, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *P. amoenolens* (Malençon) Vizzini, two species, type species *P. amoenolens* (Malençon) Vizzini, North Africa (Morocco), Southern and Southwestern Europe, Asia (Japan and South Korea), sequence data available, see Vizzini and Ercole 2012 (taxonomy).

Paraphelaria Corner 1966, *incertae sedis*, *incertae sedis*, Pucciniomycotina, asexual morph unknown, two species, type species *P. amboinensis* (Lév.) Corner, Java, South Pacific, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Parapterulicium Corner 1952, Pterulaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *P. subarbusculum* Corner, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Parasola Redhead, Vilgalys & Hopple 2001, Psathyrellaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 27 species, type species *P. plicatilis* (Curtis) Redhead, Vilgalys & Hopple, worldwide, saprobic, coprinoid, sequence data available, see Uljé 2005 (morphology, monograph, *Coprinus s. l.*), Nagy et al. 2010a (type studies, nomenclature), Schafer 2010 (key to sections), sequence data available, see Nagy et al. 2009 (phylogeny), Nagy et al. 2011 (phylogeny, evolution, Psathyrellaceae), Szarkándi et al. 2017 (phylogeny, morphology, new sp.), new spp. see Schafer 2014 (UK), Hussain et al. 2017 (Pakistan), Ganga and Manimohan 2018 (India), Hussain et al. 2018c (Pakistan).

Parastereopsis Corner 1976, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph unknown, one species, type species *P. borneensis* Corner, tubaeform basidioma, genus in need of modern interpretation, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Paratrichaptum Corner 1987, Schizoporaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *P. accuratum* Corner, Sumatra, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Paratritirachium Beguin, Pyck & Detandt 2012, Tritirachiaceae, Tritirachiales, Tritirachiomycetes, asexual morph known, two species, type species *P. cylindroconium* (de Hoog) Beguin, Pyck & Detandt, sequence data available, see Nguyen et al. 2013b (taxonomy), new sp. see Nguyen et al. 2014 (Canada).

Paraxerula R.H. Petersen 2010, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *P. americana* (Dörfelt) R.H. Petersen, Europe, East Asia, North America, sequence data available, see Petersen and Hughes 2010 (monograph), new spp. see Qin et al. 2014a (China).

Parvixerocomus G. Wu & Zhu L. Yang 2015, Boletaceae, Boletales, Agaricomycetes, aseuxal morph unknown, two species, type species *P. pseudoaokii* G. Wu, Kuan Zhao & Zhu L. Yang, stipitate-pileate, China, Japan, see sequence data available, see Wu et al. 2014b, 2016e (phylogeny, morphology).

Parvobasidium Jülich 1975, Cystostereaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *P. cretatum* (Bourdot & Galzin) Jülich, wood-rotting, widespread, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Parvodontia Hjortstam & Ryvarden 2004, Cystostereaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *P. luteocystidia* Hjortstam & Ryvarden, wood-rotting, sequence data unavailable, new spp. see Baltazar et al. 2016 (type studies, morphology).

Parvulago R. Bauer, M. Lutz, Piątek, Vánky & Oberw. 2007, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, one species, type species *P. marina* (Durieu) R. Bauer, M. Lutz, Piątek, Vánky & Oberw., plant parasite (base of culms, basal leaves) on *Eleocharis parvulus* (Cyperaceae), Europe, cultures unavailable, sequence data available, see Begerow et al. 2014 (taxonomy).

Pascua Takashima, Manabe, Nishimura, Sriswasdi, Ohkuma, Iwasaki & Sugita 2019, Trichosporonaceae, Trichosporonales, Tremellomycetes, sexual morph unknown, one species, type species *P. guehoae* (Middelhoven, Scorzettii & Fell) Takashima, Manabe, Nishimura, Sriswasdi, Ohkuma, Iwasaki & Sugita, yeast, soil, Europe, sequence data available, see Takashima et al. 2019 (taxonomy, phylogeny).

Pattersoniomyces Piątek, M. Lutz & C.A. Rosa 2017, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, one species, type species *P. tillandsiae* (F. Patt. ex G.P. Clinton) Piątek, M. Lutz, M.F. Landell & C.A. Rosa, plant parasite (inflorescences) on Poaceae, widespread, saprobic yeast on plant surfaces, cultures available, sequence data available, see Piatek et al. 2017 (taxonomy).

Paulisebacina Oberw., Garnica & K. Riess 2014, Sebacinaceae, Sebacinales, Agaricomycetes, asexual morph unknown, one species, type species *P. allantoidea* (R. Kirschner & Oberw.) Oberw., Garnica K. Riess & R. Kirschner, worldwide, sequence data available, see Oberwinkler et al. 2014 (taxonomy, phylogeny).

Paullicorticium J. Erikss. 1958, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph unknown, five species, type species *P. pearsonii* (Bourdot) J. Erikss., see Kirk et al. 2013 (genus accepted), sequence data available, see Hibbett and Binder 2002 (phylogenetic placement).

Paxillogaster E. Horak 1966, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *P. luteus* E. Horak, South America, basidioma sequestrate, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Paxillus Fr. 1836, Paxillaceae, Boletales, Agaricomycetes, asexual morph unknown, 19 species, type species *P. involutus* (Batsch) Fr., ectomycorrhizal, widespread, some species edible (*P. involutus* (Batsch) Fr.), see Dai et al. 2010b (edible mushrooms, China), some medicinal use (*P. involutus* (Batsch: Fr.) Fr.), see Dai and Yang 2008 (medicinal mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Hedh et al. 2008 (*P. involutus*), Nieto and Carbone 2009 (ecology), Vellinga et al. 2012 (*P. albidulus*, *P. ammoniavirescens*, and *P. validus* revisited), Jiménez-Ferbans and Reyes-Castill 2015 (phylogeny, taxonomy), new spp. see Gelardi et al. 2014b (south-western China), Jargeat et al. 2014, 2016 (Europe, North Africa).

Peglerochaete Sarwal & Locq. 1983, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. setiger* Sarwal & Locq., Sikkim, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pegleromyces Singer 1981, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. collybioides* Singer, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pellidiscus Donk 1959, Crepidotaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *P. pallidus* (Berk. & Broome) Donk [current name: *Crepidotus pallidus* (Berk. & Broome) Knudsen], Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Bodensteiner et al. 2004 (phylogeny, cyphelloid homobasidiomycetes).

Peniophora Cooke 1879, Peniophoraceae, Russulales, Agaricomycetes, asexual morph unknown, c. 60 species, type species *P. quercina* (Pers.) Cooke, worldwide, wood-decaying, white rot (*P. cinerea* (Pers.) Cooke), see Okamoto et al. 2010 (ethanol production), Kirk et al. 2013 (genus accepted), sequence data available, see Nagy et al. 2015 (genome, evolution).

Peniophorella P. Karst. 1889, Rickenellaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, c. 25 species, type species *P. pubera* (Fr.) P. Karst., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Hallenberg et al. 2007 (*P. praetermissa* species complex), Larsson 2007a (phylogeny), new spp. see Duhem and Buyck 2011b (France).

Perenniporia Murrill 1942, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 100 species, type species *P. medulla-panis* (Jacq.) Donk, poroid hymenophore, wood-rotting, white rot, cosmopolitan, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Robledo et al. 2009 (phylogeny), new spp. see Xiong and Cui 2008 (morphology, China), Choeyklin et al. 2009 (morphology, Thailand), Dai 2010a (morphology, Northeast China), De Jesus and Ryvarden 2010 (morphology, Brazil), Dai et al. 2011 (morphology, China), Decock and Ryvarden 2011 (new combination, morphology, Neotropics), Decock et al. 2011 (morphology, Cameroon), Cui and Zhao 2012 (phylogeny, China), Decock and Bitew 2012 (morphology, Ethiopia), Zhao and Cui 2012, 2013b (phylogeny, southern China), Decock and Ryvarden 2013, 2015 (morphology, Costa Rica, Zimbabwe), Zhao et al. 2013a, 2014a (phylogeny, China), Jang et al. 2015a (morphology, South Korea), Decock 2016 (morphology, Neotropics), Gomes-Silva et al. 2016 (morphology, Brazil), Spirin and Ryvarden 2016 (morphology, Mexico), Crous et al. 2017a (phylogeny, Brazil), Huang et al. 2017 (phylogeny, southern China), Ji et al. 2017a (phylogeny, Thailand), Liu et al. 2018c (morphology, southern China), Ryvarden 2018a (morphology, Cameroon, Mozambique), Shen et al. 2018b (new species, USA), new combination, see Hattori and Sotome 2013 (morphology, type study, Malaysia).

Perenniporiella Decock & Ryvarden 2003, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *P. neofulva* (Lloyd) Decock & Ryvarden, poroid hymenophore, wood-rotting, white rot, Central and South America, sequence data available, see Robledo et al. 2009 (new sp., phylogeny, Neotropics), Decock et al. 2010 (new combination, phylogeny, Mexico, Southeastern USA).

Perenniporiopsis C.L. Zhao 2017, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *P. minutissima* (Yasuda) C.L. Zhao, poroid hymenophore, wood-rotting, white rot, temperate east Asia, sequence data available, see Wu et al. 2017b (taxonomy, phylogeny).

Pericladium Pass. 1875, Pericladiaceae, Ustilaginales, Ustilaginomycetes, three species, type species *P. grewiae* Pass., plant parasites (galls on stems) on Tiliacea, South Africa, South Asia, Australia, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014, Nasr et al. 2014a (taxonomy, phylogeny).

Peridermium (Link) J.C. Schmidt & Kunze 1817 (= *Hypodermium* subgen. *Peridermium* Link 1816, = *Peridermium* (Link) Wallr. 1833), Cronartiaceae, Pucciniales, Pucciniomycetes, asexual morph of *Chrysomyxa* Unger 1840, *Coleosporium* Lév. 1847, *Cronartium* Fr. 1815, *Hyalopsora* Magnus 1902, *Melampsorella* J. Schröt. 1874, *Milesina* Magnus 1909, *Pucciniastrum* G.H. Otth 1861, *Thekopsora* Magnus 1875, c. 50 species, type species *P. elatinum* Kunze & J.C. Schmidt (cons. type), biotrophic on

gymnosperms especially Pinaceae, terrestrial, North America, Mexico, Argentina, Russia, China, India, Japan, see Kirk et al. 2013 (genus accepted), sequence data available, see Vogler and Bruns 1998 (phylogeny).

Peridiopsora Kamat & Sathe 1969, Pucciniastraceae, Pucciniales, Pucciniomycetes, two species, type species *P. adelocaryi* Kamat & Sathe, biotrophic on Boraginaceae, Moraceae, terrestrial, India, sequence data unavailable, see Cummins and Hiratsuka 2003 (synonym of *Milesia*), Kirk et al. 2013 (genus accepted).

Perplexostereum Ryvarden & Tutka 2014, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *P. endocrocinum* (Berk.) Ryvarden & Tutka, wood-decaying, Europe, sequence data available, see Liu et al. 2017e (*Echinodontium*, phylogeny).

Peyronelina P.J. Fisher, J. Webster & D.F. Kane 1976, Niaceae, Agaricales, Agaricomycetes, asexual morph *Glyphium* Nitschke ex F. Lehm. 1886, one species, type species *P. glomerulata* P.J. Fisher, J. Webster & D.F. Kane, America, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Yamaguchi et al. 2009 (taxonomy).

Phacellula Syd. 1927, Cryptobasidiaceae, Exobasidiales, Exobasidiomycetes, one species, type species *P. gouaniae* Syd., parasite (leaves) on *Gouania* spp. (Rhamnaceae), Costa Rica, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data unavailable, see Seifert and Bandoni 2001 (revision).

Phaeoaphelaria Corner 1953, Aphelariaceae, Cantharellales, Agaricomycetes, asexual morph unknown, one species, type species *P. australiensis* Corner, saprobes, on wood, Australia, terrestrial, North America and Europe, genus in need of modern interpretation, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Phaeoclavulina Brinkmann 1897, Gomphaceae, Gomphales, Agaricomycetes, asexual morph unknown, 41 species, type species *P. macrospora* Brinkmann, widespread, some species are ectomycorrizal (*P. abietina* with *Pinus, Betula* and *Pseudotsuga*), see González-Ávila et al. 2013 (species diversity, ecological patterns, Mexico), sequence data available, see Giachini et al. 2010 (systemics study), Maneevun et al. 2012 (Thailand).

Phaeocollybia R. Heim 1931, Hymenogastraceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 80 species, type species *P. lugubris* (Fr.) R. Heim, worldwide, see Kirk et al. 2013 (genus accepted), Norvell and Exeter 2007 (western North America), sequence data available, new spp. see Matheny et al. 2006 (phylogeny, including in the Hymenogastraceae clade), Halling and Horak 2008 (Costa Rica), Wei et al. 2010 (China), Coimbra et al. 2012 (Brazil), Khan et al. 2016 (Pakistan), Horak 2018 (monograph, New Zealand).

Phaeodepas D.A. Reid 1961, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *P. dennisii* D.A. Reid, Venezuela, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Phaeolepiota Maire ex Konrad & Maubl. 1928, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. aurea* (Matt.) Maire, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Saar et al. 2009 (phylogeny, *Cystoderma*, *Cystodermella*).

Phaeolus (Pat.) Pat. 1900, Laetiporaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *P. schweinitzii* (Fr.) Pat., poroid hymenophore, terrestrial or wood-rotting, brown rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Ortiz-Santana et al. 2013 (phylogeny, antrodia clade), Song and Cui 2017 (phylogeny), new sp. see De Jesus and Ryvarden 2010 (morphology, Brazil), Zmitrovich 2018a (taxonomy).

Phaeomarasmius Scherff. 1897, Tubariaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 20 species, type species *P. excentricus* Scherff., worldwide, saprotrophic, see Kirk et al. 2013 (genus accepted), sequence data available, see Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Matheny et al. 2007a, b (phylogeny), Petersen et al. 2010 (phylogeny, accepted in Tubariaceae), Kim et al. 2015 (Korea), Horak 2018 (monograph, New Zealand, new sp.).

Phaeomycena R. Heim ex Singer & Digilio 1952, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *P. aureophylla* R. Heim, Africa, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Phaeophlebiopsis Floudas & Hibbett 2015, Phanerochaetaceae, Polyporales, Agaricomycetes, three species, asexual morph unknown, type species *P. caribbeana* D. Floudas & Hibbett, resupinate basidioma, smooth hymenophore, wood-rotting, USA, sequence data available, see Floudas and Hibbett 2015 (taxonomy, USA), Zmitrovich 2018a (taxonomy, new combinations).

Phaeopholiota Locq. & Sarwal 1983, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. crinipellis* Locq. & Sarwal, Sikkim, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Phaeoporotheleum (W.B. Cooke) W.B. Cooke 1961, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *P. revivescens* (Berk. & M.A. Curtis) W.B. Cooke, Cuba, Argentina, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Phaeoradulum Pat. 1900, *incertae sedis*, Boletales, Agaricomycetes, asexual morph unknown, one species,

type species *P. guadelupense* Pat., West Indies, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Phaeosolenia Speg. 1902, Chromocyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, eight species, type species *P. platensis* Speg., South America, Brazil, see Kirk et al. 2013 (genus accepted), sequence data available, see Bodensteiner et al. 2004 (phylogeny, cyphelloid homobasidiomycetes), Sulzbacher et al. 2009 (Southern Brazil), Petersen et al. 2010 (phylogeny, Crepidotaceae).

Phaeotrametes Lloyd ex J.E. Wright 1966, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *P. decipiens* (Berk.) J.E. Wright, poroid hymenophore, wood-rotting, widespread (Southern Hemisphere), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Phaeotremella Rea 1912, Phaeotremellaceae, Tremellales, Tremellomycetes, sexual and asexual morphs known, eleven species, type species *P. frondosa* (Fr.) Spirin & V. Malysheva (= *P. pseudofoliacea* Rea), yeast, mycoparasite, worldwide, cultures and sequence data available, see Liu et al. 2015b, Spirin et al. 2018b (taxonomy and phylogeny).

Phaffia M.W. Mill., Yoney. & Soneda 1976, Mrakiaceae, Cystofilobasidiales, Tremellomycetes, sexual and asexual morphs known, one species, type species *P. rhodozyma* M.W. Mill., Yoney. & Soneda, yeast, widespread, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Phakopsora Dietel 1895, Phakopsoraceae, Pucciniales, Pucciniomycetes, (= *Physopella* Arthur 1905, = *Bubakia* Arthur 1906, = *Angiopsora* Mains 1934, = *Stakmania* Kamat & Sathe 1968, = *Malupa* Y. Ono, Buriticá & J.F. Hennen 1992, = *Batistopsora* Dianese, R.B. Medeiros & L.T.P. Santos 1993, = *Uredostilbe* Buriticá & J.F. Hennen 1994, = *Uredendo* Buriticá & J.F. Hennen 1994 [nom. inval.]), 116 species, type species *P. punctiformis* (Barclay & Dietel) Dietel, asexual morphs *Malupa*, *Uredendo*, *Uredostilbe*, biotrophic on c. 30 families including Fabaceae, Poaceae, Rubiaceae, terrestrial, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Berndt et al. 2008 (new sp., Cameroon, South Africa, Brazil), Yepes and de Carvalho 2009 (new spp., Brazil), Berndt and Wood 2012, Ono et al. 2012 (Japan), Pota et al. 2013 (Japan), Beenken 2014 (on *Annona*), Ono 2016 (Japan), Maier et al. 2016 (new combinations, new species, Eastern and Southern Africa).

Phallobata G. Cunn. 1926, Trappeaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, one species, type species *P. alba* G. Cunn., Australia, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006 (phylogeny).

Phallogaster Morgan 1893, Phallogastraceae, Hysterangiales, Agaricomycetes, asexual morph unknown, one species, type species *P. saccatus* Morgan, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2008 (phylogeography), Osmundson et al. 2013 (DNA barcoding).

Phallus Junius ex L. 1753, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, 34 species, type species *P. impudicus* L., worldwide, stinkhorn, some species edible (*P. fragrans* M. Zang), see Hemmes and Desjardin 2009 (morphology, Hawaiian islands), Dai et al. 2010b (edible mushrooms, China), Dutta et al. 2012 (India), Hosaka 2012 (Thailand), Kirk et al. 2013 (genus accepted), Magnago et al. 2013b (Phallales, tropical Atlantic Forest of Brazil), sequence data availale, see Trierveiler-Pereira et al. 2014a (phylogeny, Phallales), new spp. see Calonge et al. 2008 (Madeira, Portugal), Moreno et al. 2009 (Pakistan), Desjardin and Perry 2009 (São Tomé, Africa), Li et al. 2014d, 2016d (China), Rebriev et al. 2014 (Vietnam), Adamčík et al. 2015 (China), Medeiros et al. 2017 (Brazil), Song et al. 2018a (China) .

Phanerina Miettinen 2016, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *P. mellea* (Berk. & Broome) Miettinen, wood-rotting, sequence data available, see Miettinen et al. 2016b (Polypores, Phanerochaetaceae), Zmitrovich 2018a (taxonomy).

Phanerochaete P. Karst. 1889, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 80 species, type species *P. velutina* (Fr.) P. Karst, see Kirk et al. 2013 (genus accepted), Spirin et al. 2017b (generic type, nomenclature, taxonomy), resupinate basidioma, varied hymenophore (smooth, hydnoid or poroid), wood-rotting, white rot, widespread, biotechnological application, see Syed and Yadav 2012 (bioremediation, *P. chrysosporium*), Mori et al. 2017 (bioremediation, neonicotinoid insecticide, *P. sordida*), sequence data available, Martinez et al. 2004 (genome, *P. chrysosporium*), Floudas and Hibbett 2015 (new spp., phylogeny, Finland, USA), new spp. see Nakasone 2008 (morphology, new combination, type study, Germany), Hjortstam et al. 2009 (morphology, new combination, Australia, monograph), see Ghobad-Nejhad et al. 2015 (new spp., phylogeny, China), Volobuev et al. 2015 (new spp., new combination, phylogeny, Russia), Liu and He 2016a (phylogeny, China), Sadlikova and Kout 2017 (phylogeny, Thailand), new combination see Melo et al. 2012 (morphology, type study, Madeira), Miettinen et al. 2016a (phylogeny, Phanerochaetaceae).

Phanerodontia Hjortstam & Ryvarden 2010, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, four species, type species *P. dentata* Hjortstam & Ryvarden, the genus was treated as a synonym of

Phanerochaete P. Karst. 1889, see Miettinen et al. 2016a (phylogeny, Phanerochaetaceae), resupinate basidioma, smooth to hydnoid hymenophore, wood-rotting, white rot, tropical, sequence data available, new sp. see Hjortstam and Ryvarden 2010c (taxonomy, Argentina).

Phaneroites Hjortstam & Ryvarden 2010, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *P. subquercinus* (Henn.) Hjortstam & Ryvarden, resupinate basidioma, hydnoid hymenophore, wood-rotting, white rot, widespread, sequence data unavailable, see Hjortstam and Ryvarden 2010c (taxonomy).

Phellinidium (Kotl.) Fiasson & Niemelä 1984, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, five species, type species *P. ferrugineofuscum* (P. Karst.) Fiasson & Niemelä, Europe, some species medicinal use (*P. lamaënse* (Murrill) YC Dai), see Dai and Yang 2008 (medicinal mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Bödeker et al. 2009 (ectomycorrhizal fungi), Zhou et al. 2016d (monograph), new spp. see Zhou et al. 2014 (America).

Phellinopsis Y.C. Dai 2010, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, ten species, type species *P. conchata* (Pers.) Y.C. Dai, wood-rotting, white rot, sequence data available, see Zhou and Qin 2013b (phylogeny, taxonomy), Zhou 2015a (taxonomy), new spp. see Qin and Zhou 2013 (China), Rajchenberg et al. 2015 (Argentina), Zhou and Song 2017 (China).

Phellinotus Drechsler-Santos, Robledo & Rajchenb. 2016, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, two species, type species *P. neoaridus* Drechsler-Santos & Robledo, wood-rotting, white rot, poroid hymenophore, Brazil, Peru, sequence data avaiable, new spp. see Drechsler-Santos et al. 2016 (Brazil).

Phellinus Quél. 1886, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, c. 202 species, type species *P. igniarius* (L.) Quél., worldwide, some species medicinal use (*P. baumii* Pilát, *P. conchatus* (Pers.: Fr.) Quél.), see Dai and Yang 2008 (medicinal mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Vlasak and Kout 2011 (new combination, USA), de Campos Santana et al. 2016 (phylogeny, new sp.), new spp. see Yombiyeni et al. 2011 (Guineo-Congolian rainforest), Cui and Decock 2013 (China), Bian et al. 2016c (China), Vlasak and Vlasak 2017 (USA), Soares et al. 2018 (Brazil).

Phellodon P. Karst. 1881, Thelephoraceae, Thelephorales, Agaricomycetes, asexual morph unknown, 18 species, type species *P. niger* (Fr.) P. Karst., worldwide, terrestrial, see Kirk et al. 2013 (genus accepted), sequence data available, see Ainsworth et al. 2010 (cryptic taxa, European species), Baird et al. 2013a, b (phylogeny).

Phellopilus Niemelä, T. Wagner & M. Fisch. 2001, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *P. nigrolimitatus* (Romell) Niemelä, T. Wagner & M. Fisch., worldwide, sequence data available.

Phellorinia Berk. 1843, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. herculeana* (Pers.) Kreisel, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, Martin et al. 2000 (phylogeny).

Phenoliferia Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, Kriegeriaceae, Kriegeriales, Microbotryomycetes, sexual morph unknown, four species, type species *P. psychrophenolica* (Margesin & J.P. Samp.) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, psychrophilic, worldwide, cultures and sequence data available, see Wang et al. 2015e (taxonomy, phylogeny).

Phialastrum Sunhede 1989, Geastraceae, Geastrales, Agaricomycetes, asexual morph unknown, one species, type species *P. barbatum* (Dissing & M. Lange) Sunhede, Africa (tropical), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Phlebia Fr. 1821, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 60 species, type species *P. radiata* Fr., corticioid basidioma, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2004 (phylogeny), Binder et al. 2013 (phylogeny, Polyporales), Sjökvist et al. 2012 (phylogeny), new spp. Duhem 2009 (new combinations, new name, morphology, France), Bernicchia and Goijon 2010 (morphology, corticioid fungi, Europe, monograph, Italy), Singh et al. 2010a (morphology, India), Ghobad-Nejhad and Yurchenko 2012 (morphology, Azerbaijan), Duhem 2013 (morphology, France), Kaur et al. 2017 (India), Shen et al. 2018a (phylogeny, China), new combinations see Tura et al. 2011 (morphology, monograph, Israel), Gorjón and Greslebin 2012 (type study, New Zealand), Baltazar et al. 2016 (morphology, type study), needs revision since genus shown to be polyphyletic, see Justo et al. 2017.

Phlebiella P. Karst. 1890, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, 20 species, type species *P. vaga* (Fr.) P. Karst, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Ghobad-Nejhad and Kotiranta 2007 (phylogeny), Larsson 2007b (phylogeny).

Phlebiopsis Jülich 1978, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph unknown, 22 species, type species *P. gigantea* (Fr.) Jülich, resupinate basidioma, smooth or tuberculate hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted),

Zmitrovich 2018a (taxonomy), sequence data available, see Larsson 2007b (phylogeny), Hori et al. 2014 (genome, *P. gigantea*), new spp. see Douanla-Meli and Langer 2009a (morphology, Cameroon), Dhingra and Kaur 2011 (morphology, India), Kaur et al. 2015a (morphology, India), new combinations see Wu et al. 2010a (phylogeny, *Phanerochaete s. l.*), Floudas and Hibbett 2015 (phylogeny, *Phanerochaete s. l.*), Miettinen et al. 2016a (phylogeny, Phanerochaetaceae).

Phlebiporia Jia J. Chen, B.K. Cui & Y.C. Dai 2014, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, resupinate basidioma, poroid hymenophore, wood-rotting, China, type species *P. bubalina* Jia J. Chen, B.K. Cui & Y.C. Dai, sequence data available, see Chen and Cui 2014b (taxonomy, phylogeny, China), Zmitrovich 2018a (taxonomy).

Phlebogaster Fogel 1980, Claustulaceae, Phallales, Agaricomycetes, asexual morph unknown, two species, type species *P. laurisylvicola* Fogel, terrestrial, Canary Islands, Asia, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006 (gomphoid-phalloid fungi, phylogeny).

Phlebonema R. Heim 1929, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. chrysotingens* R. Heim, Madagascar, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Phlebophyllum R. Heim 1969, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. vitellinum* R. Heim & Gilles, Gabon, sequence data unavailable, see Kirk et al. 2008.

Phlebopus (R. Heim) Singer 1936, Boletinellaceae, Boletales, Agaricomycetes, asexual morph unknown, 14 species, type species *P. colossus* (R. Heim) Singer, saprotrophs, possibly ectomycorrhizal with exotic trees, widespread (pantropical), south temperate in Australia, some species edible (*P. marginatus* (J. Drumm. ex Berk.) Watling & N.M. Greg.), see Kirk et al. 2013 (genus accepted), sequence data available, see Wu et al. 2014b (phylogeny), new spp. see Pham et al. 2012 (southern Vietnam), Baroni et al. 2015 (Mexico).

Phleogena Link 1833, Phleogenaceae, Atractiellales, Atractiellomycetes, asexual morph unknown, one species, type species *P. faginea* (Fr.) Link, saprobic, on bark of decaying deciduous trees (mainly *Fagus* and *Querqus*), worldwide (northern temperate), sequence data available, see Aime et al. 2006 (phylogeny), Bauer et al. 2006 (phylogeny, simple-septate basidiomycetes).

Phloeomana Redhead 2013, Porotheleaceae, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *P. speirea* (Fr.) Redhead, worldwide, basidiomas mycenoid, fuscous, on bark and decayed phloem, sequence data unavailable, see Redhead 2013a (taxonomy).

Phlyctibasidium Jülich 1974, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, one species, type species *P. polyporoideum* (Berk. & M.A. Curtis) Jülich, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pholiota (Fr.) P. Kumm. 1871, Strophariaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 157 species, type species *P. squarrosus* Batsch, some species edible, nameko (*P. nameko* (T. Itô) S. Ito & S. Imai), see Hall et al. 2003 (edible mushrooms), Dai et al. 2010b (Chinese edible mushrooms), medicinal use (*P. adiposa* sensu Holec), see Zhang et al. 2009 (compounds), Noordeloos 2011 (Europe, monograph), Kirk et al. 2013 (genus accepted), sequence data available, see Matheny et al. 2006 (phylogeny), Siegel et al. 2015 (*P. olivaceophylla*, *P. nubigena*), new spp. see Cortez 2008 (south America), Matheny and Bougher 2010 (new combination), Tian and Bau 2013 (China). Holec et al. 2014 (Europe), Holec et al. 2014 (Europe), Niveiro et al. 2014b (Argentina), Tian et al. 2016 (China).

Pholiotina Fayod 1889, Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, 56 species, type species *P. blattaria* (Fr.) Fayod [current name: *Conocybe blattaria* (Fr.) Kühner], worldwide, saprotrophic, sequence data available, see Hausknecht 2009, Hausknecht et al. 2009 (temperate Asia), Malysheva 2011 (Russia), Kalamees et al. 2013 (checklist, Estonia), Osmundson et al. 2013 (DNA barcode), Tóth et al. 2013 (phylogeny, Bolbitiaceae), new spp. see Crous et al. 2017a (Russia), Siquier and Salom 2018 (Spain).

Phragmidiella Henn. 1905 (= *Santapauella* Mundk. & Thirum. 1945), Phakopsoraceae, Pucciniales, Pucciniomycetes, eight species, type species *P. markhamiae* Henn., biotrophic on Anacardiaceae, Bignoniaceae, Meliaceae, terrestrial, Tanzania, Uganda, Brazil, Caribbean, India, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Phragmidium Link 1816 (= *Aregma* Fr. 1815; = *Epitea* Fr. 1832; = *Lecythea* Lév. 1847; = *Phragmidium* A *Phragmidiopsis* G. Winter 1881 [1884]; = *Phragmidiopsis* (G. Winter) Mussat 1901; = *Ameris* Arthur 1906; = *Earlea* Arthur 1906; = *Frommea* Arthur 1917; = *Teloconia* Syd. 1921; = *Frommeëlla* Cummins & Y. Hirats. 1983; = *Trolliomyces* Ulbr. 1938), Phragmidiaceae, Pucciniales, Pucciniomycetes, asexual morph *Lecythea* Lév. 1847, c. 100 species, type species *P. mucronatum* (Pers.) Schltdl., biotrophic on Rosaceae, terrestrial, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Yun et al. 2011 (phylogeny, synonymised with *Frommeella*), new spp. see Zhuang and Wei 2009a (new records), Yang et al. 2015b (molecular analysis), Ali et al. 2017 (new combinations).

Phragmopyxis Dietel 1897 (= *Tricella* Long 1912), Uropyxidaceae, Pucciniales, Pucciniomycetes, four

species, type species *P. deglubens* (Berk. & M.A. Curtis) Dietel, biotrophic on Fabaceae, terrestrial, USA, Mexico, Sierra Leone, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Phragmotaenium R. Bauer, Begerow, A. Nagler & Oberw. 2001, Tilletiariaceae, Georgefischeriales, Exobasidiomycetes, five species, type species *P. indicum* (Vánky, M.S. Patil & N.D. Sharma) R. Bauer, Begerow, A. Nagler & Oberw., plant parasites (leaves, stems) on *Ischaemum* (Poaceae), saprobic yeast states, Southeast Asia, North America, cultures available, sequence data available, see Bauer et al. 2001b, Begerow et al. 2014 (taxonomy).

Phragmotelium Syd. 1921, *incertae sedis*, Pucciniales, Pucciniomycetes, c. ten species, type species *P. barnardii* (Plowr. & G. Winter) Syd., Asia, Australia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Phragmoxenidium Oberw. 1990, Phragmoxenidiaceae, Tremellales, Tremellomycetes, asexual morph unknown, one species, type species *P. mycophilum* Oberw. & Schneller, on wood, North America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Phylloboletellus Singer 1952, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *P. chloephorus* Singer, stipitate-pileate, parasitic? Central and South America, see Binder and Hibbett 2006, Kirk et al. 2013 (genus accepted), sequence data available, see Nuhn et al. 2013 (phylogeny), Farid et al. 2018 (phylogeny).

Phyllobolites Singer 1942, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *P. miniatus* (Rick) Singer, south America (tropical), see Kirk et al. 2013 (genus accepted), sequence data unavailable.

Phyllogaster Pegler 1969, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. pholiotoides* Pegler, Ghana, basidioma gasteroid, sequence data unavailable, see Giachini and Castellano 2011 (putative synonym with *Gloeocantharellus*), Kirk et al. 2013 (genus accepted).

Phylloporia Murrill 1904, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, 38 species, type species *P. parasitica* Murrill, basidioma resupinate, pileate or stipitate, amplectant, hymenophore poroid, terrestre, wood rotting, white rot, worldwide, some species medicinal use (*P. ribis* (Schumach.: Fr.) Ryvarden), see Dai and Yang 2008 (medicinal mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Gafforov et al. 2014 (phylogeny), new spp. see Valenzuela et al. 2011 (Mexico), Zhou and Dai 2012b (China), Zhou 2016 (key, China), Decock et al. 2015 (Gabon).

Phylloporopsis Angelini, A. Farid, Gelardi, M.E. Smith, Costanzo, & Vizzini 2018, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *P. boletinoides* (A.H. Sm. & Thiers) Vizzini, Angelini, A. Farid, Gelardi, Costanzo & M.E. Sm., stipitate-pileate, North and Central America, Caribbean, sequence data available, see Farid et al. 2018 (taxonomy, phylogeny).

Phylloporus Quél. 1888, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 90 species, type species *P. pelletieri* (Lév.) Quél., stipitate-pileate, ectomycorrhizal, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Neves and Halling 2010 (phylogeny, revision, Neotropics and North America), Neves et al. 2012 (phylogeny, revision, "old world"), Zeng et al. 2013 (monograph, phylogeny, China), new spp. see Neves et al. 2010 (Guyana, South America), Montoya and Bandala 2011 (Mexico), Ye et al. 2014 (China), Pradeep et al. 2015 (India), Hosen and Li 2015, Hosen and Li 2017 (Bangladesh), Zhao et al. 2018a (China), Chuankid et al. 2019 (Asia).

Phyllopta (Fr.) Fr. 1825, *incertae sedis*, *incertae sedis*, Tremellomycetes, asexual morph unknown, one species, type species *P. biparasitica* (Fr.) Fr., wood-rotting, Europe, sequence data unavailable, see Kirk et al. 2008.

Phyllotopsis E.-J. Gilbert & Donk ex Singer 1936, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *P. nidulans* (Pers.) Singer, worldwide, saprotrophic, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny et al. 2006 (phylogeny).

Phyllozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, Spiculogloeaceae, Spiculogloeales, Spiculogloeomycetes, sexual morphs unknown, seven species, type species *P. subbrunnea* (Nakase & M. Suzuki) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, plant material, worldwide, cultures and sequence data available, Wang et al. 2015e (taxonomy and phylogeny).

Physalacria Peck 1882, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, 33 species, type species *P. inflata* (Schwein.) Peck, saprotrophic, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Dentinger and McLaughlin 2006 (phylogeny), new spp. see Qin and Yang 2016 (China).

Physisporinus P. Karst. 1889, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 15 species, type species *P. vitreus* (Pers.) P. Karst., poroid hymenophore, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Miettinen et al. 2012 (phylogeny), Wu et al. 2017a (new spp., new combinations, phylogeny, China).

Physocystidium Singer 1962, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species,

type species *P. cinnamomeum* (Dennis) Singer, Trinidad, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Physodontia Ryvarden & H. Solheim 1977, *incertae sedis*, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *P. lundellii* Ryvarden & H. Solheim, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Brazee et al. 2014 (disturbance and diversity of wood-rotting fungi).

Physonema Lév. 1847, Phragmidiaceae, Pucciniales, Pucciniomycetes, one species, type species *P. pallidum* Bonord., worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Picipes Zmitr. & Kovalenko 2016, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, 16 species, type species *P. badius* (Pers.) Zmitr. & Kovalenko, stipitate basidioma, poroid hymenophore, wood-rotting, white rot, widespread, sequence date available, see Zmitrovich and Kovalenko 2016 (new genus, new combinations, phylogeny), Zhou et al. 2016b (new spp., new combinations, phylogeny, China), Zmitrovich 2018a (taxonomy).

Pilatotrama Zmitr. 2018, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, monotypic, type species *P. ljubarskyi* (Pilát) Zmitr., trametoid basidioma, wood-rotting, white rot, warm regions of Holarctics, see Justo and Hibbett 2011 (phylogeny), Zmitrovich 2018a (taxonomy).

Pileodon P. Roberts & Hjortstam 1998, *incertae sedis*, Gloeophyllales, Agaricomycetes, asexual morph unknown, two species, type species *P. megasporus* P. Roberts & Hjortstam, wood-decaying, Brunei, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pileolaria Castagne 1842 (= *Discospora* Arthur 1907), Pileolariaceae, Pucciniales, Pucciniomycetes, 16 species, type species *P. terebinthi* Castagne, biotrophic on Anacardiaceae, terrestrial, see Kirk et al. 2013 (genus accepted), sequence data available, see Doungsa-ard et al. 2015 (phylogeny), new spp. see Hüseyin and Selçuk 2016 (Turkey).

Pilocintractia Vánky 2004, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, two species, type species *P. fimbristylidicola* (Pavgi & Mundk.) Vánky, plant parasites (flowers) on *Fimbrystilis* (Cyperaceae), India, Thailand, Australia, Central America, South America, cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Piloderma Jülich 1969, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, six species, type species *P. bicolor* (Peck) Jülich, ectomycorrhizal, widespread, see Zmitrovich 2008 (species manual), Kirk et al. 2013 (genus accepted), Heinonsalo et al. 2015 (ectomycorrhizal evidences), sequence data available, see Nygren et al. 2008 (nitrate reductase-encoding genes, ectomycorrhizal fungi), Tedersoo et al. 2010 (phylogeny).

Piloporia Niemelä 1982, Incrustoporiaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *P. sajanensis* (Parmasto) Niemelä, poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Miettinen and Rajchenberg 2012 (phylogeny).

Piptoporellus B.K. Cui, M.L. Han & Y.C. Dai 2016, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, three species, type species *P. soloniensis* (Dubois) B.K. Cui, M.L. Han & Y.C. Dai, poroid hymenophore, wood-rotting, grows on angiosperm wood and causes a brown rot, widespread, sequence data available, see Han et al. 2016a (new spp., new combination, phylogeny, China).

Pirex Hjortstam & Ryvarden 1985, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species, *P. concentricus* (Cooke & Ellis) Hjortstam & Ryvarden, resupinate basidioma, odontoid to hydnoid or subporoid hymenophore, wood-rotting, North America, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Floudas and Hibbett 2015 (phylogeny).

Piskurozyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Piskurozymaceae, Filobasidiales, Tremellomycetes, twelve species, type species *P. cylindrica* (A. Fonseca, Scorzetti & Fell) X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, worldwide, sequence data available, see Liu et al. 2015b (taxonomy, phylogeny), new spp. see Yurkov et al. 2016, Kachalkin et al. 2019.

Pisolithus Alb. & Schwein. 1805, Sclerodermataceae, Boletales, Agaricomycetes, asexual morph unknown, 17 species, type species *P. arenarius* Alb. & Schwein., ectomycorrhizal, widespread, some species edible and medicinal use (*P. arhizus* (Scop.) Rauschert), see Dai and Yang 2008 (medicinal mushrooms, China), Dai et al. 2010b (edible mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Rusevska et al. 2015 (phylogeny), new spp. see Phosri et al. 2012 (Southeast Asia), Martín et al. 2013a (Spain), Crous et al. 2016a (Thailand), Lebel et al. 2018 (Australasia).

Planetella Savile 1951, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, one species, type species *P. lironis* Savile, plant parasite (ovaries) on *Carex* spp. (Cyperaceae), North America, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Platycarpa Couch 1949, Eocronartiaceae, Platygloeales, Pucciniomycetes, two species, type species *P. polypodii* (Couch) Couch, America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Platygloea J. Schröt. 1887, Platygloeaceae, Platygloeales, Pucciniomycetes, c. 16 species, type species *P. nigricans* (Fr.) J. Schröt., sequence data available, see Schoch et al. 2014 (DNA sequences).

Pleurella E. Horak 1971, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. ardesiaca* (G. Stev. & G.M. Taylor) E. Horak, New Zealand, see Kirk et al. 2013 (genus accepted), sequence data available, ITS sequence (JQ694106) is publically available from a collection (PDD 87446) referred to as *Pleurella ardesiaca* from New Zealand.

Pleurocollybia Singer 1947, Biannulariaceae, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *P. praemultifolia* (Murrill) Singer, America, Asia, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Matheny et al. 2017a (*P. cibaria* belongs to Lyophyllaceae), Alvarado et al. 2018b (*P. imbricata* in Biannulariaceae, new family), new spp. see Baroni et al. 2008 (Belize), Sánchez-García and Matheny 2017 (phylogeny).

Pleurocybella Singer 1947, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *P. porrigens* (Pers.) Singer, on wood, North temperate, some species edible but suspect (*P. porrigens* (Pers.) Singer), see Hall et al. 2003 (edible mushrooms), Dai et al. 2010b (Chinese edible mushrooms), reported as deadly poisonous in Japan, see Gonmori et al. 2011, Yamamoto et al. 2014), Kirk et al. 2013 (genus accepted), sequence data available, see Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Suzuki et al. 2013 (Omics data), new spp. see Desjardin and Hemmes 2011 (Hawaiian Islands).

Pleuroflammula Singer 1946, Crepidotaceae, Agaricales, Agaricomycetes, asexual morph unknown, ten species, type species *P. dussii* (Pat.) Singer, America, Asia, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny et al. 2006, 2015 (phylogeny), Petersen et al. 2010 (phylogeny), Horak 2018 (monograph, New Zealand).

Pleuromyces Dima, P.-A. Moreau & V. Papp 2018, Tubariaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. hungaricus* V. Papp, Dima & P.-A. Moreau, saprobic, sequence data available, see Crous et al. 2018b (phylogeny).

Pleurotus (Fr.) P. Kumm. 1871 (= *Antromycopsis* Pat. & Trab. 1897 *fide* Art. 59.1), Pleurotaceae, Agaricales, Agaricomycetes, asexual morph previously known in *Antromycopsis* Pat. & Trab. 1897, 25 species, type species *P. ostreatus* (Jacq.) P. Kumm., worldwide, some species edible, oyster mushroom (*P. ostreatus* (Jacq.) P. Kumm.), see Jayakumar et al. 2009 (compounds), Dai et al. 2010b (edible mushrooms), Sánchez 2010 (cultivation), Kirk et al. 2013 (genus accepted), Maftoun et al. 2015 (biodiversity, nutritional values), Sanuma et al. 2016 (edible mushrooms, Brazil), Zmitrovich and Wasser 2016 (problem of "*P. sajur-caju*" name, nomenclature), Castro-Alves et al. 2017 (immunomodulatory effects), sequence data available, see Wang et al. 2008b (mitochondrial genome), Alam et al. 2009 (*P. nebrodensis*), Estrada et al. 2010 (*P. eryngii*), Menolli et al. 2014 (Brazil), Shnyreva and Shnyreva 2015 (phylogeny), Yang et al. 2016c (mitochondrial genome), new spp. see Zervakis et al. 2014 (new combination), Takahashi et al. 2016 (Japan), Zhao et al. 2016c (Bailinggu).

Plicatura Peck 1872, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. nivea* (Fr.) P. Karst., North temperate, sequence data unavailable, Kirk et al. 2013 (genus accepted).

Plicaturopsis D.A. Reid 1964, Amylocorticiaceae, Amylocorticiales, Agaricomycetes, asexual morph unknown, two species, type species *P. crispa* (Pers.) D.A. Reid, worldwide, wood-rotting, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2010 (new order), Kohler et al. 2015 (genome), Zhou et al. 2016a (phylogeny).

Pluteus Fr. 1836, Pluteaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 500 species, type species *P. cervinus* (Schaeff.) P. Kumm., worldwide, some species edible, deer mushroom (*P. cervinus* (Schaeff.) P. Kumm. Syn., *P. atricapillus* (Batsch) Fayod), see Hall et al. 2003 (edible mushrooms), Dai et al. 2010b (Chinese edible mushrooms), Kirk et al. 2013 (genus accepted), sequence data available, see Justo and Castro 2007 (section *Pluteus*), Minnis and Sundberg 2010 (section *Celluloderma*), Justo et al. 2011a, b (phylogeny), Menolli et al. 2015a, b, c (Brazil, phylogeny, section *Celluloderma*, section *Hispidoderma*), Holec et al. 2018 (*P. fenzlii*), new spp. see Iliffe 2010, Menolli and Capelari (2010), Menolli et al. 2010 (Brazil), Rodríguez et al. 2010 (Mexico), Justo et al. 2012 (Dominican Republic), Pradeep et al. 2012a (India), Crous et al. 2014b (Russia), Justo et al. 2014 (Holarctic), Menolli et al. 2014 (Brazil, Africa, India, Spain), Kaur and Singh 2014 (India), Ševčíková et al. 2014 (Korea, USA), Ševčíková and Borovička 2015 (Czech Republic), Xu et al. 2015a (China), Menolli et al. 2015c (Brazil), Malysheva et al. 2016 (Russia), Campi et al. 2019 (Paraguay).

Podaxis Desv. 1809, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, ten species, type species *P. senegalensis* Desv., secotioid, subtropical dry areas, saprotrophic, see Rohit et al. 2009 (Inda), Muhsin et al. 2012 (Iraq), Kirk et al. 2013 (genus accepted), sequence data available, see Conlon et al. 2016 (South Africa, associated with termites, phylogeny), Medina-Ortiz et al. 2017 (Mexico, ethnomycology).

Podofomes Pouzar 1966, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, three species,

type species *P. corrugis* (Fr.) Pouzar, stipitate basidioma, poroid hymenophore, terrestrial or wood-inhabiting, white rot, widespread (Europa, Asia), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Podohydnangium G.W. Beaton, Pegler & T.W.K. Young 1984, Hydnangiaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. australe* G.W. Beaton, Pegler & T.W.K. Young, sequence data available.

Podoscypha Pat. 1900, Podoscyphaceae, Polyporales, Agaricomycetes, asexual morph unknown, 36 species, type species *P. surinamensis* (Lév.) Pat., wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Sjökvist et al. 2012 (phylogeny), Binder et al. 2013 (phylogeny), Ryvarden 2015e (new combination), Zmitrovich 2018a (taxonomy), genus in need of revision.

Podoserpula D.A. Reid 1963, Amylocorticiaceae, Amylocorticiales, Agaricomycetes, asexual morph unknown, two species, type species *P. pusio* (Berk.) D.A. Reid, saprobes, terrestrial, widespread, see Kirk et al. 2008, 2013 (genus accepted), *P. miranda* is thought to be ectomycorrhizal, as it appears to associate with *Arillastrum gummiferum*, see Ducousso et al. 2009, sequence data available, see Binder et al. 2010 (phylogeny), new spp. see Buyck et al. 2012b (New Caledonia).

Pogonoloma (Singer) Sánchez-García 2014, Pseudoclitocybaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *P. spinulosum* (Kühner & Romagn.) Sánchez-García, worldwide, terrestrial, presumably saprotrophic, sequence data available, see Sánchez-García et al. 2014 (taxonomy), Alvarado et al. 2018b (taxonomy).

Polioma Arthur 1907, Pucciniaceae, Pucciniales, Pucciniomycetes, five species, type species *P. nivea* (Holw.) Arthur, biotrophic on Geraniaceae, Lamiaceae, terrestrial, USA, Colombia, Ecuador, Mexico, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Poliomopsis A.W. Ramaley 1987, Uropyxidaceae, Pucciniales, Pucciniomycetes, one species, type species *P. thermopsidis* A.W. Ramaley, USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Polygaster Fr. 1823, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. sampadarius* Fr., sequence data unavailable, see Kirk et al. 2008.

Polyozellus Murrill 1910, Thelephoraceae, Thelephorales, Agaricomycetes, asexual morph unknown, one species, type species *P. multiplex* (Underw.) Murrill, North America, terrestrial, blue chanterelle, some species edible (*P. multiplex* (Underw.) Murrill), can be medicinal used, see Kirk et al. 2013 (genus accepted), Nagasawa et al. 2014 (anti-angiogenesis compounds), Yang and Song 2015 (compounds), sequence data available, see Voitk et al. 2017 (*P. multiplex*, species complex).

Polyporoletus Snell 1936, Albatrellaceae, Russulales, Agaricomycetes, asexual morph unknown, four species, type species *P. sublividus* Snell, terrestrial, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Audet 2010 (taxonomy, phylogeny).

Polyporopsis Audet 2010, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *P. mexicana* (Laferr. & Gilb.) Audet, wood-rotting, sequence data available, see Audet 2010 (phylogeny, taxonomy).

Polyporus [P. Micheli ex Adans.] Fr. 1821, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 35 species, type species *P. tuberaster* (Jacq. ex Pers.) Fr., stipitate basidioma, poroid hymenophore, wood-rotting or rarely terrestrial (sclerotium), widespread, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), some species edible or medicinal use, see Bandara et al. 2015b (review, *P. umbellatus* (Pers.) Fr.), Sanuma et al. 2016 (edible mushrooms, Brazil), sequence data available, see Zhou et al. 2016b (phylogeny, China), Zmitrovich and Kovalenko 2016 (phylogeny), Cui et al. 2019 (phylogeny, China), new spp. see Drechsler-Santos et al. 2008 (morphology, Brazil), Dai et al. 2009c (morphology, central China), Dai et al. 2014b (phylogeny, new names, Argentina, Mongolia, USA), Xue and Zhou 2014 (phylogeny, China), Hyde et al. 2016 (phylogeny, China), Runnel and Ryvarden 2016 (phylogeny, French Guiana), Si and Dai 2016 (morphology, China), Sotome et al. 2016 (phylogeny, Thailand), Tibpromma et al. 2017 (phylogeny, South Korea), new combinations, see Hattori and Sotome 2013 (morphology, type study, Malaysia), Nakasone 2015 (new names, morphology), Ryvarden et al. 2017 (morphology).

Polypus Audet 2010, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *P. dispansus* (Lloyd) Audet, see Audet 2010 (taxonomy), wood-decaying, worldwide, sequence data unavailable.

Ponticulomyces R.H. Petersen 2010, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *P. kedrovayae* R.H. Petersen, far East of Russia, China, Japan, sequence data available, see Petersen and Hughes 2010 (monograph), Ushijima et al. 2012 (Japan).

Poriodontia Parmasto 1982, Schizoporaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *P. subvinosa* Parmasto, see Kirk et al. 2013 (genus accepted), sequence data available, see Zhao et al. 2015b (phylogeny).

Porodaedalea Murrill 1905, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, 14 species, type species *P. pini* (Brot.) Murrill, worldwide,

sequence data available, see Tomšovský et al. 2010a (European species).

Porodisculus Murrill 1907, Schizophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *P. pendulus* (Schwein.) Schwein., America, Asia, see Kirk et al. 2013 (genus accepted), sequence data available, new sp. see Lee and Jung 2008 (East Asia).

Porogramme (Pat.) Pat. 1900, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, four species, type species *P. dussii* (Pat.) Pat., widespread (tropical), see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Binder et al. 2013 (phylogeny, Polyporales), new sp. see Ryvarden 2018a (morphology, Mozambique).

Porostereum Pilát 1937, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph unknown, 15 species, type species *P. phellodendri* Pilát, stereoid basidioma, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence date available, see Wu et al. 2010a (phylogeny).

Porotenus Viégas 1960, Uropyxidaceae, Pucciniales, Pucciniomycetes, seven species, type species *P. concavus* Viégas, biotrophic on Bignoniaceae, Verbenaceae, terrestrial, Brazil, Guatemala, Costa Rica, see Kirk et al. 2013 (genus accepted), sequence data available, see Beenken et al. 2012 (rust fungi on Annonaceae, *Dasyspora*).

Porotheleum Fr. 1818, Porotheleaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 16 species, type species *P. fimbriatum* (Pers.) Fr., worldwide, wood-rotting, sequence data available, see Jang et al. 2016 (Korea).

Porphyrellus E.-J. Gilbert 1931, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 20 species, type species *P. porphyrosporus* (Fr. & Hök) E.-J. Gilbert, stipitate-pileate, worldwide, sequence data available, see Wu et al. 2014b (phylogeny), new spp. see Wu et al. 2016f (China), new combination see Li and Yang 2011, Cooper 2014a.

Porpoloma Singer 1952, Tricholomataceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 13 species, type species *P. sejunctum* Singer, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Vizzini et al. 2012b (notes), Sánchez-García et al. 2014 (phylogeny), Olariaga et al. 2015b (*P. aranzadii*), Sánchez-García and Matheny 2017 (phylogeny, Tricholomatineae, evolution).

Porpolomopsis Bresinsky 2008, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *P. calyptriformis* (Berk.) Bresinsky, USA, Europe, Russia, sequence data available, see Lodge et al. 2014 (phylogeny, taxonomy, Hygrophoraceae).

Porpomyces Jülich 1982, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *P. mucidus* (Pers.) Jülich (*Ceriporiopsis mucida* (Pers.) Gilb. & Ryvarden), resupinate basidioma, poroid hymenophore, wood-rotting, sequence data available, see Kirk et al. 2013 (genus accepted).

Porpopycnis R. Kirschner 2012, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *P. lubae* R. Kirschner, Central America, sequence data available, see Kirschner et al. 2012 (taxonomy).

Portalia V. González, Vánky & Platas 2007, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, one species, type species *P. uljanishcheviana* (Schwarzman) V. González, Vánky & Platas, plant parasite (flowers) on *Scirpoides holoschoenus* (Cyperaceae), Spain, Kazakhstan, cultures unavailable, sequence data available, see Begerow et al. 2014, Nasr et al. 2014a (taxonomy).

Postia Fr. 1874, Dacryobolaceae, Polyporales, Agaricomycetes, asexual morph *Ptychogaster* Corda 1838, c. 40 species (needs revision since genus shown to be polyphyletic, see Shen et al. 2019), type species *P. lactea* (Fr.) P. Karst., poroid hymenophore, wood-rotting, brown rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Ortiz-Santana et al. 2013 (phylogeny, antrodia clade), Shen et al. 2019 (taxonomy, phylogeny), new spp. see Wei and Qin 2010 (morphology, China), Yuan et al. 2010 (morphology, Northern China), Hattori et al. 2011 (phylogeny, Malaysia), Cui and Li 2012 (morphology, Northeast China), Shen and Cui 2014 (phylogeny, China), Shen et al. 2014, 2015 (phylogeny, China), Dämmrich et al. 2017 (morphology, Germany), Yuan et al. 2017a (phylogeny, China), Miettinen et al. 2018 (phylogeny, new combinations, *P. caesia* complex, Northern Hemisphere), new combinations, see Papp 2014 (nomenclature, *P. caesia* complex).

Pouzaroporia Vampola 1992, Podoscyphaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *P. subrufa* (Ellis & Dearn.) Vampola, wood-rotting, North America, see Kirk et al. 2013 (genus accepted), sequence data available, see Justo et al. 2017 (phylogeny, family-level classification, Polyporales).

Prillingera Takashima, Manabe, Nishimura, Sriswasdi, Ohkuma, Iwasaki & Sugita 2019, Trichosporonaceae, Trichosporonales, Tremellomycetes, sexual morph unknown, one species, type species *P. fragicola* (Takashima, Sugita, Shinoda & Nakase) Takashima, Manabe, Nishimura, Sriswasdi, Ohkuma, Iwasaki & Sugita, yeast, strawberry, Japan, sequence data available, see Takashima et al. 2019 (genome, taxonomy, phylogeny).

Proceropycnis M. Villarreal, Arenal, V. Rubio, Begerow, R. Bauer, R. Kirschner & Oberw. 2006, Hoehnelomycetaceae, Atractiellales, Atractiellomycetes, asexual, teleomorph unknown, two species, type species *P. pinicola* M. Villarreal, Arenal, V. Rubio, Begerow, R. Bauer, R. Kirschner & Oberw., ecological strategy unclear, on wood

of *Pinus* spp., in beetle galleries of *Pinus* spp. and rare endopytes of *Populus trichocarpa* roots, distribution Spain, China, USA, sequence data available, see Oberwinkler et al. 2006 (integrative taxonomy, phylogeny), new spp. see Aime et al. 2018c (Oregon, USA).

Proliferobasidium J.L. Cunn. 1976, Brachybasidiaceae, Exobasidiales, Exobasidiomycetes, one species, type species *P. heliconiae* J.L. Cunn., plant parasite (leaves) on Heliconiaceae, Caribbean Basin, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data unavailable, see Begerow et al. 2002, 2014 (taxonomy).

Prospodium Arthur 1907 (= *Coinostelium* Syd. 1939; *Nephlyctis* Arthur 1907), Uropyxidaceae, Pucciniales, Pucciniomycetes, 84 species, type species *P. appendiculatum* (Kuntze) Arthur, biotrophic on Bignoniaceae, Verbenaceae, terrestrial, warmer areas of North, South and Central America, see Kirk et al. 2013 (genus accepted), sequence data available, see Jitjak and Sanoamuang 2017 (phylogeny), new spp. see Yepes and Céspedes 2008, de Carvalho and Hennen 2010 (new combinations, key to species, key to species on *Tecoma*), Silva et al. 2012 (biological control).

Protoacia Spirin & V. Malysheva 2019, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *P. delicata* Spirin & V. Malysheva, Europe (Norway, Russia, Sweden), Asia (Russian Far East), on strongly rotten wood of conifers, mostly *Picea*, sequence data available, see Spirin et al. 2019b (taxonomy, phylogeny).

Protodaedalea Imazeki 1955, Auriculariaceae, Auriculariales, Agaricomycetes, asexual morph unknown, two species, type species *P. hispida* Imazeki [current name: *Elmerina hispida* (Imazeki) Y.C. Dai & L.W. Zhou], wood-rotting, worldwide, sequence data available, see Zhou and Dai 2013b (poroid and lamellate genera, Auriculariales, taxonomy, phylogeny), Sotome et al. 2014 (new combination).

Protodontia Höhn. 1907, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, three species, type species *P. uda* Höhn., Africa (Kenya), on fallen branch of deciduous tree, sequence data available, see Spirin et al. 2019b (taxonomy, phylogeny, genus accepted).

Protogaster Thaxt. 1934, Protogastraceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *P. rhizophilus* Thaxt., on roots of *Viola*, USA, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Protogautieria A.H. Sm. 1965, Gomphaceae, Gomphales, Agaricomycetes, asexual morph unknown, two species, type species *P. lutea* A.H. Sm., N. America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Protoglossum Massee 1891, Cortinariaceae, Agaricales, Agaricomycetes, asexual morph unknown, eight species, type species *P. luteum* Massee, worldwide, basidioma sequestrate, see Kirk et al. 2013 (genus accepted), sequence data available, see Danks et al. 2010 (phylogeny, sequestrate *Cortinarius*, sub-alpine Australia), Orlovich et al. 2014 (sequestrate *Cortinarius*, New Zealand, phylogeny).

Protograndinia Rick 1933, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *P. cinerea* Rick, sequence data unavailable, see Kirk et al. 2008.

Protohydnum Möller 1895, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, three species, type species *P. cartilagineum* Möller, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Malysheva et al. 2018 (taxonomy).

Protomerulius Möller 1895, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, seven species, type species *P. brasiliensis* Möller, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Zhou and Dai 2013b (phylogeny, new spp.), Ryvarden 2016a (neotropical polypores, new combination).

Protoradulum Rick 1933, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *P. ceraceovitreum* Rick, Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Protostropharia Redhead, Moncalvo & Vilgalys 2013, Strophariaceae, Agaricales, Agaricomycetes, asexual morph unknown, 14 species, type species *P. semiglobata* (Batsch) Redhead, Moncalvo, Vilgalys, sequence data available, see Wang and Tzean 2015 (China).

Protoxerula R.H. Petersen 2010, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. flavo-olivacea* R.H. Petersen, worldwide, sequence data available, see Petersen and Hughes 2010 (taxonomy).

Protubera Möller 1895, Phallogastraceae, Hysterangiales, Agaricomycetes, asexual morph unknown, 13 species, type species *P. maracuja* Möller, worldwide, see Kirk et al. 2013 (genus accetped), sequence data available, see Giachini et al. 2010 (phylogeny), Trierveiler-Pereira et al. 2014b.

Protuberella S. Imai & A. Kawam. 1958, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *P. borealis* (S. Imai) S. Imai & A. Kawam, terrestrial, Japan, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Psathyloma Soop, J.A. Cooper & Dima 2016, Hymenogastraceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *P. leucocarpum* Soop, J.A. Cooper & Dima, South Pacific (Australia, New Zealand, South America), basidioma agaricoid, terrestrial, ectomycorrhizal, sequence data available, see Soop et al. 2016 (taxonomy, phylogeny).

Psathyrella (Fr.) Quél. 1872, Psathyrellaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 420 species, type species *P. gracilis* Fr. [current name: *P. corrugis* (Pers.) Konrad & Maubl.], worldwide, saprotrophic, some species edible (*P. atroumbonata* Pegler), some species medicinal use [*P. candolleana* (Fr.) Maire], see Ayodele and Okhuoya 2009 (nutritional), Kirk et al. 2013 (genus accepted), Al-Habib et al. 2014 (medicinal mushroom), sequence data available, see Larsson and Örstadius 2008 (Nordic countries), Padamsee et al. 2008 (phylogeny), Vašutová et al. 2008 (sections *Pennatae* and *Spadiceae*), Örstadius et al. 2015 (phylogeny), Amandeep et al. 2015b (India), new spp. see Hoashi 2008 (Japan), Frank et al. 2010 (USA), Seok et al. 2010 (Korea), Voto 2011 (Italy), Kaur et al. 2013b (India), Corriol 2014 (France), Crous et al. 2015b (Spain), Moreno et al. 2015 (Mexico), Desjardin and Perry 2016 (São Tomé and Príncipe, Africa), Crous et al. 2017a (Costa Rica), Yan and Bau 2017, 2018b (China), Broussal et al. 2018 (France, Spain).

Pseudoarmillariella (Singer) Singer 1956, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *P. ectypoides* (Peck) Singer, North and central America, Asia, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny et al. 2006 (phylogeny), Lodge et al. 2014 (phylogeny), new spp. see Yang et al. 2013b (Asia).

Pseudoauricularia Kobayasi 1982, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. papuana* Kobayasi, Papua New Guinea, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pseudoaustroboletus Y.C. Li & Zhu L. Yang 2014, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, three species, type species *P. valens* (Corner) Yan C. Li & Zhu L. Yang, stipitate-pileate, China, Japan, Malaysia, Singapore, sequence data available, see Li et al. 2014g (taxonomy, phylogeny).

Pseudobaeospora Singer 1942, Tricholomataceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 26 species, type species *P. oligophylla* (Singer) Singer, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Sánchez-García and Matheny 2017 (phylogeny, Tricholomatineae, evolution), new spp. see Voto 2009 (Italy), Vellinga 2009 (California, USA), Adamčík and Jančovičová 2011 (Slovakia), Arauzo 2011 (Spain), Schwarz 2012 (California, USA), Desjardin et al. 2014 (Hawaii, USA), Voto 2018 (Finland), Voto and Soop 2018 (New Zealand).

Pseudobensingtonia F.Y. Bai, Q.M. Wang, M. Groenewald & Boekhout 2015, Agaricostilbaceae, Agaricostilbales, Agaricostilbomycetes, sexual morph unknown, two species, type species *P. ingoldii* (Nakase & Itoh.) F.Y. Bai, Q.M. Wang, M. Groenew. & Boekhout, yeast, widespread, cultures and sequence data available, see Wang et al. 2015e (taxonomy and phylogeny).

Pseudoboletus Šutara 1991, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *P. parasiticus* (Bull.) Šutara, north temperate, stipitate-pileate, reported as parasitic on other Boletales (*Scleroderma*, *Pisolithus*, *Astraeus*) or ectomycorrhizal, see Tedersoo et al. 2010, Kirk et al. 2013 (genus accepted), sequence data available, see Zhao et al. 2015d (phylogeny).

Pseudoclathrus B. Liu & Y.S. Bau 1980, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, five species, type species *P. cylindrosporus* B. Liu & Y.S. Bau, terrestrial, China, sequence data unavailable, see Zou et al. 2008 (China, morphology), Kirk et al. 2013 (genus accepted).

Pseudoclitocybe (Singer) Singer 1956, Pseudoclitocybaceae, Agaricales, Agaricomycetes, asexual morph unknown, 16 species, type species *P. cyathiformis* (Bull.) Singer, North temperate, South America, see Kirk et al. 2013 (genus accepted), sequence data available, see Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Vizzini et al. 2011a (phylogeny, new genus), Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae), Sánchez-García and Matheny 2017 (phylogeny, Tricholomatineae, evolution), Alvarado et al. 2018b (phylogeny, morphology).

Pseudoclitopilus Vizzini & Contu 2012, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *P. rhodoleucus* (Sacc.) Vizzini & Contu, worldwide, basidioma agaricoid, on the ground, never on wood, sequence data available, see Vizzini et al. 2012b (taxonomy).

Pseudocolus Lloyd 1907, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, two species, type species *P. rothae* Lloyd [current name: *P. fusiformis* (E. Fisch.) Lloyd], worldwide (tropical, subtropical introduced), see Akata and Doğan 2011 (Turkish), Kirk et al. 2013 (genus accepted), sequence data available, see Hibbett and Binder 2002 (phylogeny, homobasidiomycetes).

Pseudodermatosorus Vánky 1999, Doassansiaceae, Doassansiales, Exobasidiomycetes, two species, type species *P. sagittariae* (Vánky & C. Vánky) Vánky, plant parasites (leaves) on Alismataceae, Africa, South America, South Asia, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014 (taxonomy).

Pseudodoassansia (Setch.) Vánky 1981, Doassansiaceae, Doassansiales, Exobasidiomycetes, two species, type species *P. obscura* (Setch.) Vánky, plant parasites (leaves) on Alismataceae, Africa, South America, South Asia, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Pseudofavolus Pat. 1900, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, four species, type species *P. miquelii* (Mont.) Pat, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Sotome et al. 2008 (phylogeny, morphology).

Pseudofibroporia Yuan Y. Chen, B.K. Cui & Y.C. Dai 2017, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *P. citrina* Yuan Y. Chen, B.K. Cui & Y.C. Dai, poroid hymenophore, wood-rotting, growing on angiosperm wood, white rot, China, sequence data available, see Chen et al. 2017d (taxonomy, phylogeny, China).

Pseudofistulina O. Fidalgo & M. Fidalgo 1963, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *P. brasiliensis* (O. Fidalgo & M. Fidalgo) O. Fidalgo & M. Fidalgo (current name: *Fistulina brasiliensis* O. Fidalgo & M. Fidalgo), Brazil, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pseudogelopellis K. Tao & B. Liu 1996, Claustulaceae, Phallales, Agaricomycetes, aseuxal morph unknown, one species, type species *P. echinoperidium* K. Tao & B. Liu, China, terrestrial, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pseudogomphus R. Heim 1970, Gomphaceae, Gomphales, Agaricomycetes, asexual morph unknown, one species, type species *P. fragilissimus* R. Heim & Gilles, Gabon, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pseudogymnopilus Raithelh. 1974, Strophariaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. pampeanus* (Speg.) Raithelh., South America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pseudohiatula (Singer) Singer 1938, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. five species, type species *P. cyatheae* Singer, tropical, see Kirk et al. 2013 (genus accepted), sequence data available, see Petersen and Hughes 2010 (phylogeny).

Pseudohydnum P. Karst. 1868, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *P. gelatinosum* (Scop.) P. Karst., widespread, edible and medicinal use, see Dai and Yang 2008 (medicinal mushrooms, China), Dai et al. 2010b (edible mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Weiß and Oberwinkler 2001 (phylogeny).

Pseudohygrophorus Velen. 1939, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. vesicarius* Velen., Europe, sequence data unavailable, see Kirk et al. 2008.

Pseudohyphozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, *incertae sedis*, *incertae sedis*, Microbotryomycetes, sexual morph unknown, three species, type species *P. buffonii* (C. Ramírez) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, worldwide, cultures and sequence data available, see Wang et al. 2015e (taxonomy, phylogeny).

Pseudoinonotus T. Wagner & M. Fisch. 2001, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, eight species, type species *P. dryadeus* (Pers.) T. Wagner & M. Fisch., worldwide, see Dai et al. 2008 (key, China), sequence data available, see Rajchenberg et al. 2015 (phylogeny, new combination),

Pseudolaccaria Vizzini, Contu & Z.W. Ge 2015, Biannulariaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. pachyphylla* (Fr.) Vizzini & Contu, habit *Laccaria*-like, sequence data available, see Lavorato et al. 2015 (revision, *Clitocybe umbrinopurpurascens*, *Neohygrophorus*, *Pseudoomphalina*), Alvarado et al. 2018b (phylogeny).

Pseudolagarobasidium J.C. Jang & T. Chen 1985, Cerrenaceae, Polyporales, Agaricomycetes, asexual morph unknown, seven species, type species *P. leguminicola* J.C. Jang & T. Chen, resupinate basidioma, wood-rotting, saprobes, facultative pathogens, or endophytic, see Hallenberg et al. 2008, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Nakasone and Lindner 2012 (new spp., new combinations, phylogeny, type study, Australia, Belize, Brazil, Ceylon, Mauritius), new combination, see Nakasone 2015 (morphology, type study, Central Europe).

Pseudolasiobolus Agerer 1983, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. minutissimus* Agerer, tropical, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pseudolepiota Z.W. Ge 2017, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. zangmui* Z.W. Ge, agaricoid, saprotrophic, tropical China, sequence data available, see Ge and Yang 2017 (phylogeny, taxonomy, China).

Pseudoleucosporidium V. de Garcia, M.A. Coelho, T. Maia, L.H. Rosa, A.B.M. Vaz, C.A. Rosa, J.P. Samp., P. Gonç., M.R. Van Broock & Libkind 2015, *incertae sedis*, *incertae sedis*, Microbotryomycetes, sexual morph known, one species, type species *L. fasciculatum* Babeva & Lisichk., yeast, from mushroom, Russia, cultures and sequence data and cultures available, see de García et al. 2015 (sexual characteristics of *Leucosporidium*, new genus, phylogeny), Wang et al. 2015e (phylogeny).

Pseudomegasporoporia X.H. Ji & F. Wu 2017, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *P. neriicola* X.H. Ji &

F. Wu, wood-rotting, east Asia, sequence data available, see Ji and Wu 2017a (taxonomy).

Pseudomerulius Jülich 1979, Tapinellaceae, Boletales, Agaricomycetes, asexual morph unknown, four species, type species *P. aureus* (Fr.) Jülich, widespread, some species medicinal use (*P. aureus* (Fr.) Jülich), see Dai and Yang 2008 (medicinal mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2004 (phylogeny, corticioid homobasidiomycetes), Binder et al. 2010 (phylogeny), Kotiranta et al. 2011 (new combinations).

Pseudomicrostroma T. Kij. & Aime 2017, *incertae sedis*, Microstromatales, Exobasidiomycetes, three species, type species *P. juglandis* (Berenger) Kijporn. & Aime, plant parasite (leaves) on *Juglans* spp. (Juglandaceae), widespread, saprobic yeast states on plants, cultures available, sequence data available, see Begerow et al. 2001, 2014, Wang et al. 2015c (phylogeney, taxonomy), Kijpornyongpan and Aime 2017 (taxonomy).

Pseudonadsoniella T.O. Kondr. & S.Y. Kondr. 2015, Meripilaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *P. brunnea* T.O. Kondr. & S.Y. Kondr., brown yeast, Antarctic, sequence data and cultures avaibale, see Kondratyuk et al. 2015 (taxonomy).

Pseudoomphalina (Singer) Singer 1956, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. six species, type species *P. kalchbrenneri* (Bres.) Singer, North temperate, see Malysheva et al. 2011 (new combination), Knudsen 2012, Kirk et al. 2013 (genus accepted), sequence data available, see Lodge et al. 2014 (phylogeny, monograph, Hygrophoraceae), Lavorato et al. 2015 (phylogeny, redescription, *Clitocybe umbrinopurpurascens*, revision, *Neohygrophorus*, *Pseudoomphalina*), Sánchez-García et al. 2017 (phylogeny, Tricholomatineae, evolution).

Pseudopiptoporus Ryvarden 1980, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *P. devians* (Bres.) Ryvarden, poroid hymenophore, wood-rotting, East Africa, India, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pseudoporpoloma Vizzini & Consiglio 2016, Tricholomataceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. pes-caprae* (Fr.) Vizzini & Consiglio, Europe, on soil, in grasslands, probably saprotrophic, sequence data available, see Vizzini et al. 2016b (phylogeny, morphology).

Pseudostypella McNabb 1969, Auriculariaceae, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *P. nothofagi* McNabb, New Zealand, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pseudotomentella Svrček 1958, Thelephoraceae, Thelephorales, Agaricomycetes, asexual morph unknown, 17 species, type species *P. mucidula* (P. Karst.) Svrček, ectomycorrhizal, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Tedersoo et al. 2010 (phylogeny, evolution).

Pseudotracya Vánky 1999, Doassansiaceae, Doassansiales, Exobasidiomycetes, one species, type species *P. otteliae* Vánky, plant parasites (vegetative parts) on Hydrocharitaceae, Australia, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Pseudotremella X.Z. Liu, F.Y. Bai, A.M. Yurkov, M. Groenew. & Boekhout 2015, Bulleraceae, Tremellales, Tremellomycetes, sexual and asexual morphs known, four species, type species *P. moriformis* (Berk.) X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, mycoparasite, on wood, Europe, cultures and sequence data available, see Liu et al. 2015b (taxonomy, phylogeny).

Pseudotricholoma (Singer) Sánchez-García & Matheny 2014, Tricholomataceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *P. umbrosum* (A.H. Sm. & M.B. Walters) Sánchez-García & Matheny, northern hemisphere, terrestrial, in woods and grasslands, probably biotrophic, possibly ectomycorrhizal, sequence data available, see Sánchez-García et al. 2014 (taxonomy), Vizzini et al. 2016b (phylogeny).

Pseudotulasnella Lowy 1964, Tulasnellaceae, Cantharellales, Agaricomycetes, asexual morph unknown, one species, type species *P. guatemalensis* Lowy, saprobes, wood-rotting, Guatemale, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pseudotyphula Corner 1953, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. ochracea* Corner, on dead wood, Central Africa, sequence data unavailable, see Kirk et al. 2013Kirk et al. 2013 (genus accepted).

Pseudowrightoporia Y.C. Dai, Jia J. Chen & B.K. Cui 2015, Hericiaceae, Russulales, Agaricomycetes, asexual morph unknown, ten species, type species *P. cylindrospora* (Ryvarden) Y.C. Dai, Jia J. Chen & B.K. Cui, wood-decaying, worldwide, sequence data available, see Chen et al. 2016b (phylogeny).

Pseudoxenasma K.H. Larss. & Hjortstam 1976, Russulaceae, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *P. verrucisporum* K.H. Larss. & Hjortstam, Europe, wood-decaying, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Larsson 2003 (phylogeny).

Pseudozyma Bandoni 1985, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, five species, type species *P. prolifica* Bandoni (Syn. *Mycosarcoma maydis* Bref. *fide* McTaggart et al. 2016c), known only from saprobic states, widespread,

five species 'pro tempore' are temporarily remained, see Kurtzman et al. 2011 (taxonomy), Kirk et al. 2013 (genus accepted), cultures available, sequence data available, see Begerow et al. 2000 (taxonomy), Wang et al. 2015c (taxonomy, phylogeny).

Psiloboletinus Singer 1945, Suillaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *P. lariceti* (Singer) Singer, Asia (temperate), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Psilocybe (Fr.) P. Kumm. 1871, Hymenogastraceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 326 species, type species *P. semilanceata* (Fr.) P. Kumm., hallucinogenic, see Redhead et al. 2007 (nomenclature), Borovička 2008 (wood rotting), Guzmán et al. 2008 (Canada), Guzmán 2009 (hallucinogenic mushrooms), Noordeloos 2009 (new combination), Guzmán et al. 2013a (Japan), Kirk et al. 2013 (genus accepted), sequence data available, see Ramírez-Cruz et al. 2013a, b (type studies, phylogeny), Borovička et al. 2011, 2015 (*P. cyanescens* complex, *P. atrobrunnea*), da Silva et al. 2014, 2016 (Brazil, taxonomy, cultural characteristics), Froese et al. 2016 (potential ritual use), new spp. see Bau and Sarentoya 2009 (China), Guzmán et al. 2009, Horak et al. 2009 (Malaysia, Thailand), Guzmán and Yang 2010 (Asian). Takahashi 2011 (Japan), Borovička et al. 2012 (USA), Guzmán et al. 2012, 2014 (Thailand, Congo), Li et al. 2014g (China), Ma et al. 2014 (China), Wang and Tzean 2015 (China), Gartz and Wiedemann 2015 (Germany), Takahashi et al. 2016 (Japan), Ma et al. 2016 (China), Terashima et al. 2016 (Japan).

Ptechetelium Oberw. & Bandoni 1984, Eocronartiaceae, Platygloeales, Pucciniomycetes, one species, type species *P. cyatheae* (Syd.) Oberw. & Bandoni, Ecuador, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pteridomyces Jülich 1979, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, four species, type species *P. galzinii* (Bres.) Jülich, see Kirk et al. 2013 (genus accepted), sequence data unavailable, new spp. see Gorjón and Hallenberg 2013 (Chile).

Pterula Fr. 1825, Pterulaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 50 species, type species *P. plumosa* (Schwein.) Fr., worldwide, clavarioid, sequence data available, see Dentinger et al. 2009 (phylogeny), Kim et al. 2015 (Korea), new spp. see Senthilarasu 2013 (India).

Pterulicium Corner 1950, Pterulaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. xylogenum* (Berk. & Broome) Corner, Asia, bamboo pathogen, see Sandeep 2010 (India), Kirk et al. 2013 (genus accepted), sequence data available, see Dentinger et al. 2009 (phylogeny).

Ptychella Roze & Boud. 1879, Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *P. ochracea* Boud., Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Puccinia Pers. 1794 (= *Argomyces* Arthur 1912, = *Argotelium* Arthur 1906, = *Bullaria* DC., in Lamarck & de Candolle 1805, = *Coronotelium* Syd. 1921, = *Cutomyces* Thüm. 1878, = *Dicaeoma* Gray 1821, = *Eriosporangium* Bertero ex Ruschenb. 1831, = *Jackya* Bubák 1902, = *Leptinia* Juel 1897, = *Leptopuccinia* (G. Winter) Rostr. 1902, = *Lindrothia* Syd. 1922, = *Linkiella* Syd. 1921, = *Lysospora* Arthur 1906, = *Micropuccinia* Rostr. 1902, = *Persooniella* Syd. 1922, = *Pleomeris* Syd. 1921, = *Poliomella* Syd. 1922, = *Puccinia* subgen. *Leptopuccinia* G. Winter 1881 [1884], = *Puccinidia* Mayr 1890, = *Rostrupia* Lagerh. 1889, = *Schroeterella* Syd. 1922, = *Sclerotelium* Syd. 1921, = *Solenodonta* Castagne 1845, = *Trailia* Syd. 1922), Pucciniaceae, Pucciniales, Pucciniomycetes, c. 3300 species, type species *P. graminis* Pers., biotrophic on most families of angiosperms especially common on Asteraceae, Cyperaceae, Liliaceae, Poaceae, worldwide in distribution, Kirk et al. 2013 (genus accepted), sequence data available, new spp. see McKenzie 2008, McTaggart and Shivas 2008, Khalid and Afshan 2009 (new records), Iqbal et al. 2009, Afshan et al. 2009, 2010b, c (new records), Berndt 2009, 2010a, 2013b (key to species from South Africa on *Helichrysum*, account of rust fungi in French Guiana), Liu and Hambleton 2010 (new series, molecular analysis, related to *P. striformis*), Liang and Kakishima 2011 (new name), Scholler et al. 2011, Zhuang and Wei 2011, Aliabadi and Abbasi 2012, de Carvalho and Hennben 2012 (key), Kirbag et al. 2011 (Turkey), Liu and Hambleton 2012, 2013 (molecular analysis, related to *P. graminis*, related to *P. coronata*, *P. coronata* Series *coronata* ser. nov., key), Gjærum and Lye 2014, Okane et al 2014, Abbasi and Aime 2016 (key), Gautam and Avasthi 2016a, b (checklist), Kumar et al. 2017 (key), Kakishima et al. 2018 (new name).

Pucciniastrum G.H. Otth 1861 (= *Calyptospora* J.G. Kühn 1869, = *Phragmopsora* Magnus 1875, = *Pomatomyces* Oerst. 1864), Pucciniastraceae, Pucciniales, Pucciniomycetes, c. 50 species, type species *P. epilobii* (Pers.) G.H. Otth, biotrophic on many dicotyledonous plants including Aceraceae, Betulaceae, Ericaceae, Fagaceae, Onagraceae, Pinaceae (alternate hosts), Rosaceae, terrestrial, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Liang and Kakishima 2011 (new name), Padamsee and Mckenzie 2014 (new species, new combination, molecular analysis), Ji et al. 2019 (new spp., China).

Pucciniosira Lagerh. 1892, Pucciniosiraceae, Pucciniales, Pucciniomycetes, (= *Aecidiella* Ellis & Kelsey 1897, = *Didymosira* Clem. 1909, = *Schizospora* Dietel 1895), 17 species, type species *P. triumfettae* Lagerh., biotrophic on Asteraceae, Berberidaceae, Malvaceae,

Solanaceae, terrestrial, America, Philippines, see Kirk et al. 2013 (genus accepted), sequence data available, see Zuluaga et al. 2011 (phylogeny, Colombian).

Pucciniostele Tranzschel & K.L. Kom., in Komarov 1899 (= *Klastopsora* Dietel, 1904; *Phragmostele* Clem. 1909), Phakopsoraceae, Pucciniales, Pucciniomycetes, four species, type species *P. clarkiana* (Barclay) Tranzschel & K.L. Kom., biotrophic on Saxifragaceae (*Astilbe*), terrestrial, Asia (China, India, Japan, Korea, Philippines), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Puccorchidium Beenken 2015, in Beenken & Wood, *incertae sedis*, Pucciniales, Pucciniomycetes, two species, type species *P. polyalthiae* (Petch) Beenken, asexual morph aecidium-like, biotrophic on Annonaceae, terrestrial, India, South Africa, Sri Lanka, see Beenken and Wood 2015 (taxonomy, phylogeny).

Pulchroboletus Gelardi, Vizzini & Simonini 2014, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *P. roseoalbidus* (Alessio & Littini) Gelardi, Vizzini & Simonini, stipitate-pileate when mature, development secondary angiocarpic, ectomycorrhizal, Europe, sequence data available, see Gelardi et al. 2014a (taxonomy).

Pulveroboletus Murrill 1909, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, 38 species, type species *P. ravenelii* (Berk. & M.A. Curtis) Murrill, stipitate-pileate, see Kirk et al. 2013 (genus accepted), Kim et al. 2017 (pharmacological significance), sequence data available, new spp. see Takahashi 2007 (Japan), Degreef and De Kesel 2009 (Gabon), Li et al. 2016b (China), Wu et al. 2016f (China), Raspé et al. 2016 (Thailand), Zeng et al. 2017 (China, monogarph), Badou (Africa), a number of species in need of revision.

Punctularia Pat. 1895, Punctulariaceae, Corticiales, Agaricomycetes, asexual morph unknown, two species, type species *P. atropurpurascens* (Berk. & Broome) Petch, wood-decaying, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Knijn and Ferretti 2018 (Italy, phylogeny), Floudas et al. 2012 (genome, evolution).

Punctulariopsis Ghobad-Nejhad 2010, Punctulariaceae, Corticiales, Agaricomycetes, asexual morph unknown, four species, type species *P. subglobispora* (Hallenb. & Hjortstam) Ghobad-Nejhad, South America, Africa, sequence data available, see Ghobad-Nejhad et al. 2010 (taxonomy and phylogeny), Ariyawansa et al. 2015 (taxonomy and phylogeny).

Purpureocorticium S.H. Wu 2017, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, one species, type species *P. microsporum* S.H. Wu, corticioid, fruit body effused, adnate, membranaceous, east Asia, sequence data available, see Wu et al. 2018c (taxonomy).

Pusillomyces J.S. Oliveira 2019, Omphalotaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *P. manuripioides* J.S. Oliveira, Neotropic and Paleoarctic, sequence data available, see Oliveira et al. 2019 (phylogeny, taxonomy).

Pycnoporellus Murrill 1905, Sparassidaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *P. fibrillosus* (P. Karst.) Murrill [current name: *P. fulgens* (Fr.) Donk], poroid hymenophore, wood-rotting, brown rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Ortiz-Santana et al. 2013 (phylogeny, antrodia clade).

Pycnopulvinus Toome & Aime 2014, Heterogastridiaceae, Heterogastridiales, Microbotryomycetes, presumably asexual state, asexual morph unknown (no sporogenous cells were detected by the authors), one species, type species *P. aurantiacus* Toome & Aime, ecological strategy unclear: saprobic / mycoparasitic, on palm leaf litter (in association with other fungi) in tropical forests, Ecuador (type locality) and Costa Rica (only from sequence data), sequence data available, see Toome and Aime 2014 (phylogeny, taxonomy).

Pycnovellomyces R.F. Castañeda 1987, *incertae sedis*, *incertae sedis*, Agaricomycetes, one species, type species *P. foliicola* R.F. Castañeda, Cuba, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Pyrofomes Kotl. & Pouzar 1964, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, eight species, type species *P. demidoffii* (Lév.) Kotl. & Pouzar, poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), Zmitrovih 2018a (taxonomy), sequence data available, see Vlasák et al. 2018 (new combinations, phylogeny, North America), new sp. see Cui and Dai 2011 (morphology, China).

Pyrrhoderma Imazeki 1966, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, two species, type species *P. sendaiense* (Yasuda) Imazeki, Japan, Argentina, see Kirk et al. 2013 (genus accepted), sequence data available, see He and Dai 2012 (*Hymenochaete*, phylogeny).

Pyrrhoglossum Singer 1944, Cortinariaceae, Agaricales, Agaricomycetes, asexual morph unknown, twleve species, type species *P. pyrrhum* (Berk. & M.A. Curtis) Singer, tropical, Europe, see Kirk et al. 2013 (genus accepted), Horak 2018 (monograph, New Zealand), sequence data unavailable, new spp. see Corriol 2009 (Europe).

Quadrispora Bougher & Castellano 1993, Cortinariaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *Q. oblongispora* (G.W. Beaton, Pegler & T.W.K. Young) Bougher & Castellano, Australia, see Kirk et al. 2013 (genus accepted), sequence data available.

Quambalaria J.A. Simpson 2000, Quambalariaceae, Microstromatales, Exobasidiomycetes, seven species, type species *Q. pitereka* (J. Walker & Bertus) J.A. Simpson, plant parasites on genera *Corymbia* and *Eucalyptus* (Myrtaceae), anamorphic genus, saprobes on *Betula* (Betulacea), or isolated from human skin, South Africa, Austrlia, Europe, cultures available, sequence data available, see de Beer et al. 2006, Antropova et al. 2014, Begerow et al. 2014, Wang et al. 2015c (phylogeny), Bezerra et al. 2018 (new sp., Brazil).

Queiroziella C.R. Félix, J.D.P. Bezerra, R.P. Neves & Landell 2018, *incertae sedis*, *incertae sedis*, Cystobasidiomycetes, one species, type species *Q. brasiliensis* C.R. Félix, P. Valente & Landell, yeast, colonies pink to salmon, Brazil, cultures and sequence data available, see Crous et al. 2018b (phylogeny, taxonomy).

Queletia Fr. 1872, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *Q. mirabilis* Fr., secotioid, worldwide, sequence data unavailable, see Moreno et al. 2012 (Spain), Kirk et al. 2013 (genus accepted), Kříž and Zíta 2016 (Czech Republic).

Raduliporus Spirin & Zmitr. 2006, Irpicaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *R. aneirinus* (Sommerf.) Spirin & Zmitr., resupinate basidioma, poroid hymenophore, wood-rotting, white rot, widespread, sequence data available, see Gómez-Montoya et al. 2017a (phylogeny, morphology).

Radulochaete Rick 1940, *incertae sedis*, Cantharellales, Agaricomycetes, asexual morph unknown, two species, in need of modern interpretation, type species *R. ceracea* Rick, sequence data unavailable, see Kirk et al. 2008.

Radulodon Ryvarden 1972, Cerrenaceae, Polyporales, Agaricomycetes, asexual morph unknown, eleven species, type species *R. americanus* Ryvarden, hydnoid hymenophore, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Hallenberg et al. 2008 (phylogeny), Nakasone and Lindner 2012 (phylogeny), Kotiranta et al. 2017 (phylogeny), new spp. see Jyoti and Dhingra 2014 (morphology, Himalaya), Kaur et al. 2014b (morphology, India).

Radulodontia Hjortstam & Ryvarden 2008, *incertae sedis*, *incertae sedis*, Basidiomycota, asexual morph unknown, one species, type species *R. pyriformis* Hjortstam & Ryvarden, sequence data unavailable, see Hjortstam and Ryvarden 2008a (taxonomy).

Radulomyces M.P. Christ. 1960, Pterulaceae, Agaricales, Agaricomycetes, asexual morph unknown, ten species, type species *R. confluens* (Fr.) M.P. Christ., worldwide, wood decaying, see Gilbertson and Nakasone 2003 (Hawaii), Ghobad-Nejhad and Kotiranta 2007 (*R. rickii*), Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2004 (phylogeny, corticioid homobasidiomycetes), Zhao et al. 2016b (taxonomy).

Radulomycetopsis Dhingra, Priyanka & J. Kaur 2012, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *R. cystidiata* Dhingra, Priyanka & J. Kaur, India, sequence data unavailable, see Dhingra and Kaur 2012 (taxonomy).

Radulotubus Y.C. Dai, S.H. He & C.L. Zhao 2016, Pterulaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *R. resupinatus* Y.C. Dai, S.H. He & C.L. Zhao, wood-rotting, poroid, China, sequence data available, see Zhao et al. 2016b (taxonomy).

Ramakrishnania Ramachar & Bhagyan. 1979, Pucciniaceae, Pucciniales, Pucciniomycetes, one species, type species *R. ixorae* Ramachar & Bhagyan., biotrophic on Rubiaceae (*Ixora*), terrestrial, India, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Ramaria Fr. ex Bonord. 1851, Gomphaceae, Gomphales, Agaricomycetes, asexual morph unknown, c. 230 species, type species *R. botrytis* (Pers.) Ricken, widespread, some species edible (*R. flava* (Schaef.: Fr.) Quél.), see Gursoy et al. 2010 (antioxidant activities), Kirk et al. 2013 (genus accepted), Liu et al. 2013 (anticancer, antioxidant and antibiotic activities), some species lethal (*R. rufescens*), see Huang et al. 2009 (China), sequence data available, see Nasim et al. 2008 (Pakistan, morphology), Knudson 2012 (Minnesota), new spp. see Cázares et al. 2011 (Central Mexican oak forests), Hughes et al. 2014b (Arkansas).

Ramaricium J. Erikss. 1954, Gomphaceae, Gomphales, Agaricomycetes, asexual morph unknown, five species, type species *R. occultum* J. Erikss., wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2005.

Ramariopsis (Donk) Corner 1950, Clavariaceae, Agaricales, Agaricomycetes, asexual morph unknown, 48 species, type species *R. kunzei* (Fr.) Corner, worldwide, see Kautmanová et al. 2012a, b (Europe, phylogeny), Birkebak et al. 2013 (phylogeny), Kirk et al. 2013 (genus accepted), Furtado et al. 2016 (Brazil), new spp. see Olariaga and Salcedo 2013 (new combination), Hyde et al. 2016 (Atlantic rain forest).

Ranadivia Zmitr. 2018, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *R. allantoidea* (M.L. Han, B.K. Cui & Y.C. Dai) Zmitr., corioloid basidioma, wood-rotting, brown rot, pantropical, see Zmitrovich 2018a (taxonomy).

Ravenelia Berk. 1853 (= *Cephalotelium* Syd. 1921, = *Cystingophora* Arthur 1907, = *Cystotelium* Syd. 1921, = *Dendroecia* Arthur 1906, = *Haploravenelia* Syd. 1921, = *Longia* Syd. 1921, = *Neoravenelia* Long 1903, = *Pleoravenelia* Long 1903), Raveneliaceae, Pucciniales, Pucciniomycetes, c. 250 species, type species *R. glanduliformis* Berk. & M.A. Curtis, biotrophic on

Fabaceae, terrestrial, worldwide in warm climates except Europe, Australia, see Kirk et al. 2013 (genus accepted), sequence data available, see Gandhe and Kuvalekar 2007 (phylogeny), Zhao et al. 2016d (evolution), new spp. see Zhuang and Wei 2009b (China), Yepes and de Carvalho 2014 (Brazil), Hernández et al. 2014 (online database), Ebinghaus et al. 2018 (South Africa).

Rectipilus Agerer 1973, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, eleven species, type species *R. fasciculatus* (Pers.) Agerer, cyphelloid, worldwide, sequence data available, see Bodensteiner et al. 2004 (phylogeny, cyphelloid homobasidiomycetes), Kirk et al. 2013 (genus accepted), new spp. see Gorjón and de Jesus 2014 (Brazilian Amazon), Lucas and Dentinger 2015 (Great Britain).

Renatobasidium Hauerslev 1993, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *R. notabile* Hauerslev, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Repetobasidiellum J. Erikss. & Hjortstam 1981, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph unknown, one species, type species *R. fusisporum* J. Erikss. & Hjortstam, saprobes, widespread, northern Europe, sequence data unavailable, see Larsson 2007b (genus *incertae sedis* in Agaricomycetes), Kirk et al. 2013 (genus accepted).

Repetobasidiopsis Dhingra & Avn.P. Singh 2008, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *R. grandispora* Dhingra & Avn.P. Singh, resupinate basidioma, smooth hymenophore, bambusicolous, widespread, sequence data unavailable available, see Dhingra and Singh 2008a (nomenclature, validation).

Repetobasidium J. Erikss. 1958, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph unknown, twelve species, type species *R. vile* (Bourdot & Galzin) J. Erikss., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2006 (phylogeny, hymenochaetoid clade).

Resinicium Parmasto 1968, Rickenellaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, eight species, type species *R. bicolor* (Alb. & Schwein.) Parmasto, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Nakasone 2007 (monograph), Gruhn et al. 2017b (worldwide key, phylogeny, new species), new spp. see Telleria et al. 2008a (Equatorial Guinea), Baltazar et al. 2016 (type examination).

Resiniporus Zmitr. 2018, Irpicaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *R. resinascens* (Romell) Zmitr., resupinate porioid basidioma, wood-rotting, white rot, widespread, see Zmitrovich 2018a (taxonomy).

Resinomycena Redhead & Singer 1981, Mycenaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. ten species, type species *R. rhododendri* (Peck) Redhead & Singer, North America, Europe, Japan, see Antonín and Noordeloos 2004 (Europe), Kirk et al. 2013 (genus accepted), sequence data available, see Petersen et al. 2008 (new genus), new spp. see Desjardin et al. 2016 (Brazil), Takahashi et al. 2016 (Japan).

Resinoporia Audet 2017, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, eleven species, type species *R. crassa* (P. Karst.) Audet, wood-rotting, most species transformed from *Antrodia s. s.* or *Amyloporia s. s.*, sequence data available, see Ortiz-Santana et al. 2013 (antrodia clade of Polyporales, phylogeny).

Restilago Vánky 2008, *incertae sedis*, *incertae sedis*, Basidiomycota, asexual morph unknown, one species, type species *R. capensis* Vánky, sequence data unavailable, see Vánky 2008 (taxonomy).

Restingomyces Sulzbacher, Grebenc & Baseia 2016, Trappeaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, one species, type species *R. reticulatus* Sulzbacher, B.T. Goto & Baseia, sequestrate, Brazilian Atlantic rainforest, sequence data available, see Sulzbacher et al. 2016b (taxonomy).

Restiosporium Vánky 2000, Websdaneaceae, Ustilaginales, Ustilaginomycetes, 21 species, type species *R. meneyae* Vánky, plant parasites (fruits) on Restionaceae, Australia, cultures unavailable, sequence data available, see Begerow et al. 2014, Nasr et al. 2014a (taxonomy).

Resupinatus Nees ex Gray 1821, Pleurotaceae, Agaricales, Agaricomycetes, asexual morph unknown, 33 species, type species *R. applicatus* (Batsch: Fr.) Gray, worldwide, basidioma cyphelloid, see Kirk et al. 2013 (genus accepted), sequence data available, see Nogueira-Melo et al. 2011 (America), Gonou-Zagou et al. 2011 (Greece), McDonald 2015 (systematics, North American collections of *R. poriaeformis* need a new name, also see Haelewaters et al. 2018).

Retiboletus Manfr. Binder & Bresinsky 2002, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, twelve species, type species *R. ornatipes* Manfr. Binder & Bresinsky, stipitate-pileate, North America, Asia, some species edible (*R. ornatipes* (Peck) Manfr. Binder & Bresinsky), see Dai et al. 2010b (edible mushrooms, China), see Gruber et al. 2013 (compounds), sequence data available, see Zeng et al. 2016 (monograph, China), new spp. see Wu et al. 2016f (China), Zeng et al. 2016 (monograph, China).

Rhacophyllus Berk. & Broome 1871 (= *Zerovaemyces* Gorovij 1977), Psathyrellaceae, Agaricales, Agaricomycetes, sexual morph *Coprinopsis* P. Karst. 1881, one species, type species *R. lilacinus* Berk. & Broome, sequence data unavailable, see Redhead et al. 2000.

Rhamphospora D.D. Cunn. 1888, Rhamphosporaceae, Doassansiales, Exobasidiomycetes, one species, type species *R. nymphaeae* D.D. Cunn., plant parasites (leaves) on genera *Castalia*, *Nymphea*, *Nuphar* (Nymphaeaceae), widespread, India, North America, see Kirk et al. 2013 (genus accepted), cultures available, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Rheubarbariboletus Vizzini, Simonini & Gelardi 2015, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *R. armeniacus* (Quél.) Vizzini, Simonini & Gelardi, stipitate-pileate, ectomycorrhizal, Europe, sequence data available, see Vizzini 2015 (taxonomy).

Rhizochaete Gresl., Nakasone & Rajchenb. 2004, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph unknown, 13 species, type species *R. brunnea* Gresl., Nakasone & Rajchenb., resupinate basidioma, smooth to slightly tuberculate hymenophore, wood-rotting, widespread, see Zmitrovich 2018a (taxonomy), sequence data available, see Greslebin et al. 2004 (phylogeny), Nakasone et al. 2017 (new sp., new combinations, phylogeny, morphology, type study, Belize), new combinations see Chikowski et al. 2016a, b (phylogeny, nomenclature, validation).

Rhizoctonia DC. 1805, Ceratobasidiaceae, Cantharellales, Agaricomycetes, sexual morph *Thanatephorus* Donk 1956, see Gónzalez et al. 2016, c. 50 species, type species *R. solani* J.G. Kühn, widespread, see Kirk et al. 2013 (genus accepted), *R. solani* is a serious pathogen of plant, see Zheng et al. 2013 (evolution), Chen et al. 2017c (pathogen), has priority over *Thanathephorus* see Oberwinkler et al. 2017, sequence data available, see Zheng et al. 2013 (evolution, rice sheath blight pathogen), Gónzalez et al. 2016 (phylogeny), new spp. and new combinations see Oberwinkler et al. 2013a (Germany).

Rhizocybe Vizzini, G. Moreno, P. Alvarado & Consiglio 2015, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *R. vermicularis* (Fr.) Vizzini, G. Moreno, P. Alvarado & Consiglio, in coniferous forests of the Northern hemisphere, spring and summer, basidioma clitocyboid (funnel-shaped or umbilicate), small, with conspicuous rhizomorphs, sequence data available, see Alvarado et al. 2015 (taxonomy).

Rhizomarasmius R.H. Petersen 2000, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *R. pyrrhocephalus* (Berk.) R.H. Petersen, Europe, sequence data available, see Ronikier and Ronikier 2011 (phylogeny), Moreau et al. 2015b (emendation).

Rhizopogon Fr. 1817, Rhizopogonaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 157 species, type species *R. luteolus* Fr., ectomycorrhizal, see Murata et al. 2013b, widespread (north temperate, introduced with pines in southern hemisphere), some species edible (*R. luteolus* Fr. & Nordholm), some species medicinal use (*R. piceus* Berk. & M.A. Curtis), see Dai and Yang 2008 (medicinal mushrooms, China), Dai et al. 2010b (edible mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Mujic et al. 2019 (genome, phylogeny), new spp. see Grubisha et al. 2014 (eastern North America), Mujic et al. 2014 (Japan), Crous et al. 2015a (Cape Verde Islands), Koizumi and Nara 2016 (Japan), Li et al. 2016e (China).

Rhizoporia Audet 2017, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *R. hyalina* (Spirin, Miettinen & Kotir.) Audet, wood-rotting, sequence data available, see Spirin et al. 2013a (phylongeny, *Antrodia s. s.*).

Rhodactina Pegler & T.W.K. Young 1989, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, three species, type species *R. himalayensis* Pegler & T.W.K. Young, basidiomas sequestrate, ectomycorrhizal, tropical Asia, see Kirk et al. 2013 (genus accepted), sequence data available, see Vadthanarat et al. 2018 (phylogeny, new sp., Thailand).

Rhodoarrhenia Singer 1964, Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, eight species, type species *R. pezizoidea* (Speg.) Singer, tropical, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Rhodocollybia Singer 1939, Omphalotaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 35 species, type species *R. maculata* (Alb. & Schwein.) Singer, worldwide, see Antonín and Noordeloos 2010 (Europe), Kirk et al. 2013 (genus accepted), sequence data available, see Garnica et al. 2007 (Agarics, phylogeny, basidiospore ultrastructure), Keirle et al. 2010, 2012 (Hawaii, *R. laulaha*), Petersen and Hughes 2016 (phylogeny), new spp. see Eyssartier et al. 2011a (Europe), Cooper 2014b (New Zealand, new combinations), Mata et al. 2016 (neotropical), Latha et al. 2018a (India).

Rhodocybe Maire 1926, Entolomataceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 50 species, type species *R. caelata* (Fr.) Maire, worldwide, see Kirk et al. 2013 (genus accepted), Horak 2008 (New Zealand, monograph), Noordeloos and Gates 2012a (Tasmania, Australia, morphology, monograph, as *Clitopilus s. l.*) dos Santos Silva-Filho et al. 2018 (new records, Brazil), sequence data available, see Co-David et al. 2009 (phylogeny), Kluting et al. 2014 (phylogeny), new spp. Dähncke et al. 2008 (Canary Islands, Spain), Henkel et al. 2010b (Guyana), Noordeloos et al. 2010 (Germany, as *Clitopilus*), Contu et al. 2011 (France, as *Clitopilus*), Kaur et al. 2013a (India), Crous et al. 2016b (India), Hyde et al. 2016 (India), Vizzini et al. 2016c, d, 2018 (new

combination, Turkey, Estonia, Italy), Crous et al. 2017a, b (India, Italy), Sesli and Vizzini 2017 (Turkey).

Rhodofomes Kotl. & Pouzar 1990, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *R. roseus* (Alb. & Schwein.) Vlasák, perennial basidioma, poroid hymenophore, wood-rotting, brown rot, widespread, sequence data available, see Han et al. 2016a (taxonomy, *Fomitopsis s. l.*).

Rhodofomitopsis B.K. Cui, M.L. Han & Y.C. Dai 2016, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, four species, type species *R. feei* (Fr.) B.K. Cui, M.L. Han & Y.C. Dai, poroid hymenophore, wood-rotting, brown rot, widespread, sequence data available, see Han et al. 2016a (new genus, new combinations, phylogeny, *Fomitopsis s. l*).

Rhodonia Niemelä 2005, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *R. placenta* (Fr.) Niemelä, K.H. Larss. & Schigel, resupinate basidioma, poroid hymenophore, wood-rotting, brown rot, widespread (circumpolar in the boreal conifer zone), sequence data available, see Martinez et al. 2009 (genome, lignocellulose conversion), Justo et al. 2017 (phylogeny, Polyporales).

Rhodosporidiobolus Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, Sporidiobolaceae, Sporidiobolales, Microbotryomycetes, sexual and asexual morphs known, eleven species, type species *R. nylandii* (M. Takash. & Nakase) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, worldwide, cultures and sequence data available, see Wang et al. 2015e (taxonomy and phylogeny), Urbina and Aime 2018 (diversity), Masiulionis and Pagnocca 2017, Turchetti et al. 2018 (new spp.).

Rhodotorula F.C. Harrison 1927, Sporidiobolaceae, Sporidiobolales, Microbotryomycetes, sexual and asexual morphs known, 15 species, type species *R. glutinis* (Fresen.) F.C. Harrison, yeast, worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Wang et al. 2015e (taxonomy and phylogeny), Urbina and Aime 2018 (diversity).

Rhodophana Kühner 1971, Entolomataceae, Agaricales, Agaricomycetes, asexual morph unknown, seven species, type species *R. nitellina* (Fr.) Papetti, worldwide, sequence data available, see Co-David et al. 2009 (phylogeny), Baroni and Matheny 2011 (phylogeny), Kluting et al. 2014 (phylogeny), Morgado et al. 2016b (phylogeny), new spp. see Consiglio and Contu 2008 (Italy, as *Rhodocybe*), Vizzini et al 2011b (Canary Islands, Spain, as *Clitopilus*), Raj et al. 2016 (India), Daniels et al. 2017 (Niger, Africa).

Rhodotus Maire 1926, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *R. palmatus* (Bull.) Maire, Europe, North America, China, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Binder et al. 2006 (phylogeny), new spp. see Tang et al. 2014 (China).

Rhopalogaster J.R. Johnst. 1902, Rhizopogonaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *R. transversarius* (Bosc) J.R. Johnst., USA, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006 (phylogeny, gomphoid-phalloid fungi).

Rhynchogastrema B. Metzler & Oberw. 1989, Rhynchogastremaceae, Tremellales, Tremellomycetes, asexual and sexual morph known, nine species, type species *R. coronatum* B. Metzler & Oberw., yeast, filamentous, see Kirk et al. 2013 (genus accepted), cultures and sequence data available, see Liu et al. 2015b (taxonomy, phylogeny).

Rickenella Raithelh. 1973, Rickenellaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, c. ten species, type species *R. fibula* (Bull.) Raithelh., worldwide, see Antonín and Noordeloos 2004 (European taxa), Kirk et al. 2013 (genus accepted), sequence data available, see Pérez-Izquierdo et al. 2017 (phylogeny), new spp. see Latha et al. 2015a (India).

Rickiopora Westph., Tomšovský & Rajchenb. 2016, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *R. latemarginata* (Rick) Westph., Tomšovský & Rajchenb., poroid hymenophore, wood-rotting, white rot, Neotropical, sequence data available, see Westphalen et al. 2016b (taxonomy, phylogeny, biology, type study).

Riessia Fresen. 1852, *incertae sedis*, *incertae sedis*, Agaricomycetes, five species, type species *R. semiophora* Fresen., worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Riessiella Jülich 1985, *incertae sedis*, *incertae sedis*, Agaricomycetes, two species, type species *R. clavata* Jülich, S. E. Asia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Rigidoporus Murrill 1905, Meripilaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 30 species, type species *R. micromegas* (Mont.) Murrill [current name: *R. microporus* (Sw.) Overeem *fide* Wu et al. 2017a], poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), some species plant pathogens, see Farid et al. 2009 (plantations, Malaysia, *R. microporus*), some species medicinal use, see Dai et al. 2009b (medicinal mushrooms, China, *R. ulmarius* (Sowerby) Imazeki), sequence data available, see Wu et al. 2017a (phylogeny), new spp. see Læssøe and Ryvarden 2010a (morphology, Ecuador), Ryvarden and Iturriaga 2010 (morphology, Venezuela), Vampola and Vlasák 2012 (phylogeny, Central Europe), Yuan and Dai 2012 (morphology, China), Gomes-Silva et al. 2014 (morphology, Brazil, Neotropics), Ryvarden 2014 (morphology, tropical America), Wu et al. 2017a (new combinations, phylogeny,

morphology, China), Ryvarden 2018a (morphology, Zambia).

Rigidotubus J. Song, Y.C. Dai & B.K. Cui 2018, Cystostereaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *R. tephroleucus* J. Song, Y.C. Dai & B.K. Cui, wood-rotting, white rot, China, sequence data available, see Song et al. 2018c (phylogeny, taxonomy).

Rimbachia Pat. 1891, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, eleven species, type species *R. paradoxa* Pat., tropical, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), new spp. see Miettinen and Hernawati 2010 (Indonesia).

Riopa D.A. Reid 1969, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph *Sporotrichum* Link 1809, three species, type species *R. davidii* D.A. Reid, resupinate basidioma, poroid hymenophore, wood-rotting, widespread, sequence data available, see Miettinen et al. 2016a (new sp., new combination, phylogeny, type study), Zmitrovich 2018a (taxonomy).

Ripartitella Singer 1947, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *R. squamosidisca* (Murrill) Singer, tropical, see Kirk et al. 2013 (genus accepted), sequence data available, see Capelari and Asai 2009 (Brazil), Saar et al. 2009 (phylogeny), Baroni et al. 2014 (phylogeny).

Ripartites P. Karst. 1879, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *R. tricholoma* (Alb. & Schwein.) P. Karst., worldwide, see Kirk et al. 2013 (genus accepted), Tolgor et al. 2013 (China), sequence data available, see Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Osmundson et al. 2013 (DNA barcode).

Ripexicium Hjortstam 1995, *incertae sedis*, Corticiales, Agaricomycetes, asexual morph unknown, one species, type species *R. spinuliferum* (Jülich) Hjortstam, wood-decaying, Solomon Islands, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Robbauera Boekhout, Begerow, Q.M. Wang & F.Y. Bai 2015, Robbaueraceae, Robbauerales, Exobasidiomycetes, one species, type species *R. albescens* (Gokhale) Boekhout, Begerow, Q.M. Wang & F.Y. Bai, known only from saprobic states, biocontrol agent for powery mildew, possibly mycoparasite, cultures available, sequence data available, see Begerow et al. 2000, 2014, Wang et al. 2015c (taxonomy, phylogeny).

Roestelia Rebent. 1804 (= *Cancellaria* Brongn. 1825, = *Centridium* Chevall. 1826), Pucciniaceae, Pucciniales, Pucciniomycetes, asexual genus, c. 15 species, type species *R. cancellata* Rebent., typically aecial state of *Gymnosporangium*, biotrophic mainly on Rosaceae (one species on Cupressaceae), terrestrial, north temperate areas including Asia, Europe, North America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Rogersella Liberta & A.J. Navas 1978, Schizoporaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *R. asperula* Liberta & A.J. Navas, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2006 (phylogeny, hymenochaetoid clade).

Rogersiomyces J.L. Crane & Schokn. 1978, Hydnaceae, Cantharellales, Agaricomycetes, two species, type species *R. okefenokeensis*, USA, Asia, hypochnoid basidiomas over moistening plant debris, see Mel'nik et al. 2015 (as *Hyphobasidiofera*, Vietnam), sequence data available, see Psurtseva et al. 2016 (new species, phylogeny, life cycle).

Romagnesiella Contu, Matheny, P.-A. Moreau, Vizzini & A. de Haan 2014, Crassisporiaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *R. clavus* (Romagn.) Contu, Matheny, P.-A. Moreau, Vizzini & A. de Haan, Northern hemisphere, basidioma naucorioid, on unburnt soil or sand among mosses and grasses, sequence data available, see Matheny et al. 2015 (taxonomy), Vizzini et al. 2019 (phylogeny and taxonomy).

Roridomyces Rexer 1994, Mycenaceae, Agaricales, Agaricomycetes, asexual morph unknown, nine species, type species *R. roridus* (Fr.) Rexer, some species luminescent (*R. pruinosoviscidus* (Corner) A.L.C. Chew & Desjardin), see Desjardin et al. 2008a (luminescent fungus), Kirk et al. 2013 (genus accepted), sequence data available, see Chew et al. 2015 (Malaysia, phylogeny, bioluminescent fungi), Kim et al. 2015 (Korea), new spp. see Hausknecht and Krisai-Greilhuber 2008 (Italy), Miersch et al. 2010 (new combination).

Roseofavolus T. Hatt. 2003, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *R. eos* (Corner) T. Hatt., poroid hymenophore, wood-rotting, Southeast Asia, sequence data unavailable, see Kirk et al. 2008.

Roseograndinia Hjortstam & Ryvarden 2005, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *R. rosea* (Henn.) Hjortstam & Ryvarden, wood-rotting, widespread, sequence data unavailable, see Kirk et al. 2008.

Rossbeevera T. Lebel, Orihara & N. Maek. 2012 [as 'Rosbeeva'], Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, ten species, type species *R. pachydermis* (Zeller & C.W. Dodge) T. Lebel, sequestrate, ectomycorrhizal, Asia and Australasia, DNA sequence data available, new spp. see Lebel et al. 2012, Orihara et al. 2012a (China), Orihara et al. 2016b.

Royoungia Castellano, Trappe & Malajczuk 1992, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, six species, type species *R. boletoides*

Castellano, Trappe & Malajczuk, sequestrate or stipitate-pileate, Australia, China, Malaysia, see Kirk et al. 2013 (genus accepted), sequence data available, see Halling et al. 2012b (phylogeny), new spp. see Wu et al. 2016f (China).

Rubellofomes B.K. Cui, M.L. Han & Y.C. Dai 2016, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *R. cystidiatus* (B.K. Cui & M.L. Han) B.K. Cui, M.L. Han & Y.C. Dai, poroid basidioma, wood-rotting, growing on angiosperm, brown rot, widespread, sequence data available, see Han et al. 2016a (taxonomy, phylogeny, *Fomitopsis s. l.*).

Rubroboletus Kuan Zhao & Zhu L. Yang 2014, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, 14 species, type species *R. sinicus* (W.F. Chiu) Kuan Zhao & Zhu L. Yang, stipitate-pileate, worldwide, some species edible (*R. esculentus* Kuan Zhao, Hui M. Shao & Zhu L. Yang), see Zhao et al. 2017 (new spp., China), sequence data available, see Zhao et al. 2014c (monograph), Janda et al. 2017 (morphology study, *R. legaliae*).

Rubroporus Log.-Leite, Ryvarden & Groposo 2002, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *R. carneoporis* Log.-Leite, Ryvarden & Groposo, stipitate or pileate basidioma, poroid hymenophore, wood-rotting (or on buried root), white rot, Belize, Brazil, sequence data unavailable, see Kirk et al. 2008.

Rugiboletus G. Wu & Zhu L. Yang 2015, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *R. extremiorientalis* (Lj.N. Vassiljeva) G. Wu & Zhu L. Yang, stipitate-pileate, China, Far East Russia, Korea, Japan, Nepal, Thailand, Central and South America, sequence data available, see Wu et al. 2014b, 2016e (phylogeny, morphology, Boletaceae).

Rugosomyces Raithelh. 1979, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. twelve species, type species *R. onychinus* Raithelh. [current name: *Lyophyllum onychinum* (Fr.) Kühner & Romagn. ex Contu], worldwide, sequence data available, see Bellanger et al. 2015 (phylogeny).

Rugosospora Heinem. 1973, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *R. ochraceobadia* (Beeli) Heinem., tropical, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Ruinenia Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, Ruineniaceae, Agaricostilbales, Agaricostilbomycetes, sexual morph unknown, five species, type species *R. rubra* (Nakase, Oakada & Sugiy.) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, worldwide, cultures and sequence data available, see Wang et al. 2015e (taxonomy, phylogeny).

Russula Pers. 1796, Russulaceae, Russulales, Agaricomycetes, asexual morph unknown, > 3000 species estimated, type species *R. emetica* (L.) Pers., seven subgenera, subg. *Archaea* Buyck & V. Hofst., subg. *Compactae* (Fr.) Bon, emend. Buyck & V. Hofst., subg. *Crassotunicata* Buyck & V. Hofst., subg. *Heterophyllidia* Romagnesi, subg. *Malodora* Buyck & V. Hofst., subg. *Brevipes* Buyck & V. Hofst., subg. *Russula* Buyck & V. Hofst., see Buyck et al. 2018b (taxonomy, phylogeny), > 50 sections,worldwide, ectomycorrhizal, often associated with mycoheterotroph plants (particularly orchids), commercially important edible species particularly in Asia, see Buyck 2008 (Madagascar), Geml et al. 2010, 2012b (boreal Alaska, phylogeny, Arctic, biogeography), Li et al. 2010a (China), other taxonomic studies see Adamčík and Buyck 2011a, b, 2012, 2014 (type specimens), Buyck and Adamčík 2011a, b, 2013a, b (type specimens), Kirk et al. 2013 (genus accepted), Li 2014 (morphology), Hongsanan et al. 2015 (three new subgenera), Kong et al. 2015 (ectomycorrhizal), Das et al. 2017d (three new sections and one new subsection), Elliott and Trappe 2018 (recombinations), Adamčík et al. 2013, 2018 (type specimens), Adamčík and Jančovičová 2012, 2013 (type specimens), Buyck et al. 2018a (systemics, multigene phylogeny, new subgenera, ectomycorrhizal anatomy), sequence data available, see Buyck et al. 2008 (multigene phylogeny), Li et al. 2010c (population genetics), Cao et al. 2013 (population genetics), Kleine et al. 2013 (population genetics), Park et al. 2013, 2014b (multigene phylogeny), Guo et al. 2014 (phylogeny), Shimono et al. 2014 (phylogeny), Wang et al. 2015b (population genetics), Looney et al. 2016 (multigene phylogeny), Bazzicalupo et al. 2017 (multigene phylogeny, barcode PNW), Caboň et al. 2017 (multigene phylogeny), Geml et al. 2017 (tropical rainforests, Borneo), Lee et al. 2017 (Korea, phylogeny, section *Foetentinae*), Li et al. 2019a (barcode selection), Vidal et al. 2019 (phylogeny), selected new species per continent, North America see Adamčík et al. 2010, 2015, 2016b, Arora and Nguyen 2014, Liu et al. 2015a, Hyde et al. 2017a; Asia see Kanad et al. 2010, 2013b, 2017d, Li et al. 2011a, 2012, 2013a, 2015a, d, 2016b, 2018a, b, 2019b, Dutta et al. 2015b, Hyde et al. 2016, Zhao et al. 2015g, Paloi et al. 2016, Sang et al. 2016, Jiang et al. 2018, Buyck et al. 2017, Jabeen et al. 2017, Zhang et al. 2017a, Lee et al 2017, Song et al. 2018e, Wang et al. 2019; Europe see Jurkeit et al. 2011, Pidlich-Aigner 2014, Adamčík et al. 2016b, Vauras et al. 2016, Melera et al. 2017, Trendel et al. 2018; South America see Cheype and Campo 2012, Miller et al. 2012; Africa see Buyck 2008, Douanla-Meli and Langer 2009c, Sanon et al. 2014, Wang et al. 2018e; Oceania see Kropp 2016, Buyck et al. 2017.

Ryvardenia Rajchenb. 1994, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, two species,

type species *R. cretacea* (Lloyd) Rajchenb., poroid hymenophore, wood-rotting, brown rot, Southern Hemisphere (Argentina, Australia, Chile, New Zealand), see Kirk et al. 2013 (genus accepted), sequence data available, see Pildain and Rajchenberg 2013 (phylogeny, *Postia s. l.*, Argentina).

Saccosoma Spirin 2018, Phleogenaceae, Atractiellales, Atractiellomycetes, asexual morph unknown, nine species, type species *S. farinaceum* (Höhn.) Spirin & K. Põldmaa, presumably saprobic, on decaying wood and decaying herbaceous material, worldwide (Europe, North and South America, China, St. Helena), sequence data available, new spp. see Spirin et al. 2018c (taxonomy, phylogeny), Schoutteten et al. 2018 (taxonomy).

Tow new combinations proposed:

Saccosoma jozefii (Schoutteten & Verbeken) Schoutteten, ***comb. nov.***, MB 828708

Basionym: *Helicogloea jozefii* Schoutteten & Verbeken in Cryptogamie Mycologie 39 (3): 312 (2018).

Saccosoma graminicola (Bres.) Schoutteten, ***comb. nov.***, MB 828707

Basionym: *Saccoblastia graminicola* Bres. in Annales Mycologici 1 (2): 112 (1903), non *Exobasidium graminicolum* Bres. in Krieger, *Fung. Saxon. Exsicc.*, Pilze Sachsen's: no. 664 (1892)

Sagaranella V. Hofst., Clémençon, Moncalvo & Redhead 2014, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *S. tylicolor* (Fr.) V. Hofstetter, Clémençon, Moncalvo & Redhead, worldwide, basidioma mycenoid, sequence data available, see Hofstetter et al. 2014 (phylogeny, Lyophyllaceae).

Saitozyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Trimorphomycetaceae, Tremellales, Tremellomycetes, sexual morph unknown, four species, type species *S. flava* (Golubev & J.P. Samp.) X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, on soil, worldwide, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Sakaguchia Y. Yamada, K. Maeda & Mikata 1994, Sakaguchiaceae, Sakaguchiales, Cystobasidiomycetes, sexual and asexual morphs known, five species, type species *S. dacryoidea* (Fell, I.L. Hunter & Tallman) Y. Yamada, K. Maeda & Mikata, Antarctica, yeast, aquatic, marine, plant, see Kurtzman et al. 2011 (taxonomy), Kirk et al. 2013 (genus accepted), sequence data available, see Wang et al. 2015e (taxonomy, phylogeny).

Salmacisia D.R. Huff & A. Chandra 2008, Tilletiaceae, Tilletiales, Exobasidiomycetes, one species, type species *S. buchloeana* (Kellerm. & Swingle) D.R. Huff & Amb. Chandra, plant parasite (ovaries) on *Buchloë* (Poaceae), North America, cultures available, sequence data available, see Chandra and Huff 2008 (description), Begerow et al. 2014, Huff et al. 2017 (genome announcement).

Sampaiozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, *incertae sedis*, *incertae sedis*, Microbotryomycetes, sexual morph unknown, two species, type species *S. ingeniosa* (Di Menna) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, worldwide, cultures and sequence data available, see Wang et al. 2015e (taxonomy, phylogeny).

Sanghuangporus Sheng H. Wu, L.W. Zhou & Y.C. Dai 2015, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, 13 species, type species *S. sanghuang* (Sheng H. Wu, T. Hatt. & Y.C. Dai) Sheng H. Wu, L.W. Zhou & Y.C. Dai, some species medicinal use (*S. sanghuang* (Sheng H. Wu, T. Hatt. & Y.C. Dai) Sheng H. Wu, L.W. Zhou & Y.C. Dai), see Lin et al. 2017 (anti-inflammatory activity), sequence data available see Zhou et al. 2016e (monograph), Raja et al. 2017 (DNA barcoding), new sp. see Ghobad-Nejhad 2015 (Iran), new combination see Tomšovský 2015.

Saprogaster Fogel & States 2001, *incertae sedis*, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *S. pinyonensis* Fogel & States, terrestrial, America, sequence data unavailable, see Kirk et al. 2008.

Sarcodon Quél. ex P. Karst. 1881, Bankeraceae, Thelephorales, Agaricomycetes, asexual morph unknown, 49 species, type species *S. imbricatus* (L.) P. Karst, terrestrial, ectomycorrhizal, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Grupe et al. 2015, 2016 (Neotropics).

Sarcodontia Schulzer 1866, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *S. mali* Schulzer [current name: *S. crocea* (Schwein.) Kotl.], hydnoid hymenophore, wood-rotting, white rot, widespread, see Szczepkowski 2010 (distribution, decay ability), Kirk et al. 2013 (genus accepted), sequence data available, see Tomšovský et al. 2016 (phylogeny), Justo et al. 2017 (phylogeny, Polyporales), Zmitrovich 2018a (taxonomy).

Sarcomyxa P. Karst. 1891, Mycenaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *S. serotina* (Pers.) P. Karst., worldwide, some species edible [*S. edulis* (Y.C. Dai, Niemelä & G.F. Qin) T. Saito, Tonouchi & T. Harada], sequence data available, see Saito et al. 2014 (phylogeny).

Sarcoporia P. Karst. 1894, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, nine species, type species *S. polyspora* P. Karst, resupinate to effused-reflexed basidioma, poroid hymenophore, wood-rotting, brown rot, widespread, sequence data available, see Justo et al. 2017 (phylogeny, classification), new sp. see Vlasák et al. 2015 (phylogeny, USA, Costa Rica).

Scalarispora Buriticá & J.F. Hennen 1994, Phakopsoraceae, Pucciniales, Pucciniomycetes, one species, type species *S. hashiokae* (Hirats. f.) Buriticá & J.F. Hennen,

biotrophic on Vitaceae (*Ampelopsis*), terrestrial, China, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Sceptrulum K.H. Larss. 2014, Peniophoraceae, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *S. inflatum* (Burt) K.H. Larss., wood-decaying, Europe, Jamaica, Seychelles, sequence data unavailable, see Gorjón 2012 (taxonomy), Larsson 2014 (taxonomy).

Schenella T. Macbr. 1911, Geastraceae, Geastrales, Agaricomycetes, asexual morph unknown, four species, type species *S. simplex* T. Macbr., wood-decaying, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Estrada-Torres et al. 2005 (taxonomy).

Schildia Franchi & M. Marchetti 2015, *incertae sedis*, Cantharellales, Agaricomycetes, asexual morph unknown, one species, type species *S. sancti-luxurii* Franchi & M. Marchetti, Russia, sequence data available, see Franchi and Marchetti 2015 (taxonomy).

Schinzinia Fayod 1889, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *S. pustulosa* Fayod, East Africa, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Schizonella J. Schröt. 1877, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, five species, type species *S. melanogramma* (DC.) J. Schröt., plant parasite (leaves) on *Carex* spp. and *Kobresia myosuroides* (Cyperaceae), North America, Asia, Europe, see Kirk et al. 2013 (genus accepted), cultures available, sequence data available, see Begerow et al. 2014, Wang et al. 2015c (taxonomy, phylogeny).

Schizophyllum Fr. 1815, Schizophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *S. commune* Fr., worldwide, wood-rot, see Kirk et al. 2013 (genus accepted), could be pathogenic for human, see Kumar and Min 2011 (compounds), Chowdhary et al. 2013 (pathogen), Saha et al. 2013 (pathogen), sequence data available, see Ohm et al. 2010 (genome).

Schizopora Velen. 1922, Schizoporaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, seven species, type species *S. laciniata* Velen. (current name: *Polyporus laciniatus* Velen., worldwide, white rot (*S. paradoxa*), see Kirk et al. 2013 (genus accepted), sequence data available, see Min et al. 2015 (Genome).

Schizostoma Ehrenb. ex Lév. 1846, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *S. laceratum* (Ehrenb. ex Fr.) Lév., secotioid, subtropical dry areas, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Schroeteriaster Magnus 1896 (= *Uromycodes* Clem. 1909), *incertae sedis*, Pucciniales, Pucciniomycetes, four species, type species *S. alpinus* Magnus, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Scleroderma Pers. 1801, Sclerodermataceae, Boletales, Agaricomycetes, asexual morph unknown, c. 46 species, type species *S. verrucosum* (Bull.) Pers., widespread, some species edible (*S. aurantiacum* (L.) Pers.), see Dai et al. 2010b (edible mushrooms, China), some medicinal use (*S. areolatum* Ehrenb), see Dai and Yang 2008 (medicinal mushrooms, China), Kirk et al. 2013 (genus accepted), Guzmán et al. 2013b (monograph, new records, Mexico), sequence data available, new spp. see Alfredo et al. 2012b (Amazon rainforest), Nouhra et al. 2012 (Argentina), Kumla et al. 2013 (Thailand), Zhang et al. 2013 (south China), Baseia et al. 2016 (Brazil), Crous et al. 2016a (Cape Verde Islands, Brazil).

Sclerogaster R. Hesse 1891, Sclerogastraceae, Geastrales, Agaricomycetes, asexual morph unknown, eleven species, type species *S. lanatus* R. Hesse, Europe, America, basidioma gasteroid, hypogeous, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2006, 2008 (phylogeny), Krakhmalnyi et al. 2014 (Israel), Alfredo et al. 2015 (*S. luteocarneus*), new spp. see Sulzbacher et al. 2016a (Brazil).

Sclerotrema Spirin & Malysheva 2017, Auriculariaceae, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *S. griseobrunneum* (K. Wells & Raitv.) Spirin & Malysheva, wood-rotting, on dry branches and logs of deciduous trees, sequence data available, see Malysheva and Spirin 2017 (taxonomy, phylogeny, stereoid basidiocarps, Auriculariales).

Scopulodontia Hjortstam 1998, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, three species, type species *S. loricata* Hjortstam & P. Roberts, wood-decaying, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Scopuloides (Massee) Höhn. & Litsch. 1908, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, five species, type species *S. hydnoides* (Cooke & Massee) Hjortstam & Ryvarden, resupinate basidioma, odontioid hymenophore, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson 2007a (phylogeny, classification), Wu et al. 2010a (phylogeny), Kuuskeri et al. 2015 (phylogeny, molecular systematics, *Phlebia*).

Scotoderma Jülich 1974, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *S. viride* (Sacc.) Jülich, wood decaying, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Scotomyces Jülich 1978, Ceratobasidiaceae, Cantharellales, Agaricomycetes, asexual morph unknown, one species, type species *S. fallax* (G. Cunn.) Jülich, saprobes, wood-decaying, widespread but rare see Güngör et al. 2013 (new record in Turkey), Ambrosia 2014 (Italy), genus in

need of modern interpretation, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Scutelliformis Salazar-Yepes, Pardo-Card. & Buriticá, 2007, Phragmidiaceae, Pucciniales, Pucciniomycetes, one species, type species *S. bicornus* Salazar-Yepes, Pardo-Card. & Buriticá, anamorph of *Gerwasia*, biotrophic on Rosaceae (*Rubus*), terrestrial, South America (Ecuador), sequence data unavailable, see Kirk et al. 2008.

Scutiger Paulet 1808, Albatrellaceae, Russulales, Agaricomycetes, asexual morph unknown, ten species, type species *S. tuberosus* Paulet, on soil, worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Scytinopogon Singer 1945, Hydnodontaceae, Trechisporales, Agaricomycetes, asexual morph unknown, five species, type species *S. pallescens* (Bres.) Singer, Europe, Africa, India, see Kirk et al. 2013 (genus accepted), see Acharya 2012 (India), sequence data available, see Larsson et al. 2011 (phylogeny), new sp. see Desjardin and Perry 2015 (Africa).

Scytinostroma Donk 1956, Peniophoraceae, Russulales, Agaricomycetes, asexual morph unknown, 35 species, type species *S. portentosum* (Berk. & M. A. Curtis) Donk, wood-decaying, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Larsson 2003 (phylogeny).

Scytinostromella Parmasto 1968, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, six species, type species *S. heterogenea* (Bourdot & Galzin) Parmasto, worldwide, wood-decaying, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Larsson 2003 (phylogeny), Zmitrovich 2018a.

Sebacina Tul. & C. Tul. 1871, Sebacinaceae, Sebacinales, Agaricomycetes, asexual morph *Opadorhiza* T.F. Andersen & R.T. Moore 1996, 17 species, type species *S. incrustans* (Pers.) Tul. & C. Tul., mycorrhizal, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Oberwinkler et al. 2013b (Sebacinales, phylogeny), Riess et al. 2013 (speciation, *S. epigaea*, *S. incrustans*), Kühdorf et al. 2014 (mycorrhizal), Ruibal et al. 2014 (phylogenetic markers, Australian orchids), Tedersoo et al. 2014 (phylogeny, biogeography), new spp. see Roberts 2008a (Belize), Oberwinkler et al. 2014, Moyersoen and Weiß 2014 (Southern Venezuela), Wartchow et al. 2015b (Brazil).

Sebipora Miettinen 2012, Gelatoporiaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *S. aquosa* Miettinen, poroid hymenophore, wood-rotting, white rot, tropical Asia, sequence data available, see Miettinen and Rajchenberg 2012 (taxonomy, phylogeny, Indonesia).

Secotium Kunze 1840, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. ten species, type species *S. gueinzii* Kunze, worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Sedecula Zeller 1941, Coniophoraceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *S. pulvinata* Zeller, USA, see Kirk et al. 2013 (genus accepted), sequence data available, see Trappe et al. 2015 (phylogeny).

Semiomphalina Redhead 1984, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *S. leptoglossoides* (Corner) Redhead, Papua New Guinea, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Septobasidium Pat. 1892, Septobasidiaceae, Septobasidiales, Pucciniomycetes, c. 200 species, type species *S. velutinum* Pat., worldwide, some species pathogenic, see Choi et al. 2016a (felt disease of *Schisandra chinensis*), sequence data available, see Henk and Vilgalys 2007 (phylogeny), new spp. and new record see Lu and Guo 2009, 2010a, b (China), Lu et al. 2010 (China), Chen and Guo 2011a, b (China), Lu and Guo 2011 (China), Li and Guo 2013, 2014 (China), Li et al. 2013c (China).

Serendipita P. Roberts 1993, Serendipitaceae, Sebacinales, Agaricomycetes, asexual morph unknown, eleven species, type species *S. vermifera* (Oberw.) P. Roberts, endophyte, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Zuccaro et al. 2011 (endophytic life strategies, genome and transcriptome analyses, as *Piriformospora*), Oberwinkler et al. 2014 (phylogeny), Weiß et al. 2016 (description of Family Serendipitaceae, phylogeny, ecology), new spp. see new spp. see Basiewicz et al. 2012 (Australia, as *Piriformospora*), Riess et al. 2014 (phylogenetic diversity and community structure, Europe, North America).

Serpula (Pers.) Gray 1821, Serpulaceae, Boletales, Agaricomycetes, asexual morph unknown, c. eleven species, type species *S. destruens* (Pers.) Gray, saprotrophic, see Skrede et al. 2013, widespread, some species medicinal use (*S. lacrimans* (Wulfen: Fr.) P. Karst.), see Dai and Yang 2008 (medicinal mushrooms, China), some species the agent of dry rot timber decay in buildings, see Watkinson and Eastwood 2012 (*S. lacrymans* (Wulfen) J. Schröt.), Kirk et al. 2013 (genus accepted), sequence data available, see Kauserud et al. 2007 (*S. lacrymans* (Wulfen) J. Schröt., evolution), Engh 2010 (*S. lacrymans*, evolution), Carlsen et al. 2011 (*S. himantioides* species complex), Binder et al. 2013 (phylogeny), Balasundaram et al. 2015 (DNA markers).

Serpulomyces (Zmitr.) Zmitr. 2002, Amylocorticiaceae, Amylocorticiales, Agaricomycetes, asexual morph unknown, one species, type species *S. borealis* (Romell) Zmitr. [current name: *Ceraceomyces borealis* (Romell) J. Erikss. & Ryvarden], sequence data available, see Binder et al. 2013 (phylogeny).

Seticyphella Agerer 1983, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *S. tenuispora* Agerer, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Setigeroclavula R.H. Petersen 1988, Clavariaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *S. ascendens* R.H. Petersen, New Zealand, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Setogyroporus Heinem. & Rammeloo 1982, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *S. verus* Heinem. & Rammeloo, stipitate-pileate, presumably ectomycorrhizal, tropical Africa, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Shivasia Vánky, M. Lutz & Piątek 2012, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, one species, type species *S. solida* (Berk.) Vánky, M. Lutz & Piątek, plant parasite (flowers) on *Schoenus* (Cyperaceae), Australasia, cultures unavailable, sequence data available, see Lutz et al. 2012, Begerow et al. 2014, Nasr et al. 2014a (taxonomy, phylogeny).

Sidera Miettinen & K.H. Larss. 2011, *incertae sedis*, Hymenochaetales, Agaricomycetes, asexual morph unknown, six species, type species *S. lenis* (P. Karst.) Miettinen, sequence data available, see Miettinen and Larsson 2011 (taxonomy).

Sigmogloea Bandoni & J.C. Krug 2000, *incertae sedis*, Tremellales, Tremellomycetes, asexual morph unknown, one species, type species *S. tremelloidea* Bandoni & J.C. Krug, wood-decaying, North America, sequence data unavailable, see Kirk et al. 2008.

Simocybe P. Karst. 1879, Crepidotaceae, Agaricales, Agaricomycetes, asexual morph unknown, 26 species, type species *S. centunculus* (Fr.) P. Karst., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny et al. 2006 (phylogeny), Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Horak 2018 (monograph, New Zealand, new sp.), new spp. see Bandala et al. 2008b (Spain), Horak and Ronikier 2011 (Europe).

Singerina Sathe & S.D. Deshp. 1981, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *S. indica* Sathe & S.D. Deshp., India, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Singerocomus T.W. Henkel & M.E. Sm. 2016, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *S. inundabilis* (Singer) T.W. Henkel, stipitate-pileate, ectomycorrhizal, South America, sequence data available, see Henkel et al. 2016 (phylogeny, taxonomy), new sp. Magnago et al. 2018 (Brazil).

Singerocybe Harmaja 1988, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, seven species, type species *S. viscida* Harmaja, Europe, North America, Asia, sequence data available, see Qin et al. 2014b (taxonomy).

Singeromyces M.M. Moser 1966, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *S. ferrugineus* M.M. Moser, morchelliform, presumably ectomycorrhizal with *Nothofagus*, South America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Sinohygrocybe C.Q. Wang, Ming Zhang & T.H. Li 2018, Hygrophoraceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *S. tomentosipes* C.Q. Wang, Ming Zhang & T.H. Li, East Asia, sequence data available, see Wang et al. 2018a (taxonomy).

Sirobasidium Lagerh. & Pat. 1892, *incertae sedis*, Tremellales, Tremellomycetes, sexual and asexual morphs unknown, eight species, type species *S. sanguineum* Lagerh. & Pat., wood decaying, worldwide, see Kurtzman et al. 2011 (taxonomy), Kirk et al. 2013 (genus accepted), cultures and sequence data available, see Millanes et al. 2011 (phylogeny), Liu et al. 2015b (taxonomy, phylogeny).

Sirotrema Bandoni 1986, *incertae sedis*, Tremellales, Tremellomycetes, asexual morph unknown, three species, type species *S. pusilla* Bandoni, on fungal ascocarps, wood-decaying, worldwide, see Kirk et al. 2013 (genus accepted), cultures and sequence data available see Kachalkin et al. 2019 (taxonomy).

Sistotrema Fr. 1821, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph *Burgoa* Goid. 1937, *Ingoldiella* D.E. Shaw 1972, c. 55 species, type species *S. confluens* Pers., saprotrophic, ectomycorrhizal, see Di Marino et al. 2008, Münzenberger et al. 2012, worldwide, see Kirk et al. 2013 (genus accepted), *S. brinkmannii* was consistently isolated from bareroot nursery *Pinus banksiana* Lamb seedlings (however nature of association remains unclear), see Potvin et al. 2012 (association with host), sequence data available, see Moncalvo et al. 2006 (phylogeny), Larsson 2007b (phylogeny), new spp. see Kotiranta and Larsson 2013 (Finland), Zhou and Qin 2013a (China), Crous et al. 2014b (Netherlands), Gruhn et al. 2017a (Martinique), Kaur et al. 2019 (India).

Sistotremastrum J. Erikss. 1958, Hydnodontaceae, Trechisporales, Agaricomycetes, asexual morph unknown, six species, type species *S. suecicum* Litsch. ex J. Erikss., wood-decaying, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Telleria et al. 2013b, 2014 (Macaronesian islands, Chile).

Sistotremella Hjortstam 1984, Hydnaceae, Cantharellales, Agaricomycetes, asexual morph unknown, three species, type species *S. perpusilla* Hjortstam, wood-decaying,

Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Skeletocutis Kotl. & Pouzar 1958, Incrustoporiaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 40 species, type species *S. amorpha* (Fr.) Kotl. & Pouzar, generic limits is not settled, see Justo et al. 2017, poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Miettinen and Larsson 2011 (phylogeny), new spp. see Cui and Dai 2008 (morphology, China), Li et al. 2008 (morphology, China), Ryvarden 2009 (morphology, USA), Dai 2012a (morphology, China), Vlasák et al. 2012 (phylogeny, USA), Zhou and Qin 2012b (morphology, China), Cui 2013b (morphology, China), Bian et al. 2016b (phylogeny, China), Fan et al. 2017 (phylogeny, China), Korhonen et al. 2018 (*S. nivea* species complex), Miettinen and Niemelä 2018 (temperate), Ryvarden 2018a (morphology, Uganda, Zambia).

Skeletohydnum Jülich 1979, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *S. nikau* (G. Cunn.) Jülich, resupinate basidioma, hydnoid hymenophore, wood-rotting, New Zealand, sequence data unavailable, see Kirk et al. 2013 (genus accepted), Nakasone et al. 2013 (morphology).

Skepperia Berk. 1857, Thelephoraceae, Thelephorales, Agaricomycetes, asexual morph unknown, five species, type species *S. convoluta* Berk., wood-decaying, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Skepperiella Pilát 1927, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, four species, type species *S. spathularia* (Berk. & M.A. Curtis) Pilát, on wood, worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Skierka Racib. 1900 (= *Ctenoderma* Syd. & P. Syd. 1919), Pileolariaceae, Pucciniales, Pucciniomycetes, 13 species, type species *S. canarii* Racib., biotrophic on Burseraceae, Euphorbiaceae, Sapindaceae, Vitaceae, terrestrial, circumglobal in tropics, sequence data unavailable, see Kirk et al. 2013 (genus accepted), new spp. see Gautam and Avasthi 2017 (India).

Skvortzovia Bononi & Hjortstam 1987, *incertae sedis*, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *S. furfurella* (Bres.) Bononi & Hjortstam, South America, see Kirk et al. 2013 (genus accepted), sequence data avaialble, see Miettinen and Larsson 2011 (phylogeny).

Slooffia Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, *incertae sedis*, *incertae sedis*, Microbotryomycetes, sexual morph unknown, four species, type species *S. tsugae* (Phaff & Carmo Souza) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, worldwide, cultures and sequence data available, see Wang et al. 2015e (taxonomy, phylogeny), new sp. see Yurkov et al. 2016.

Smithiogaster J.E. Wright 1975, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *S. volvoagaricus* J.E. Wright, secotioid, Argentina, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Smithiomyces Singer 1944, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *S. mexicanus* (Murrill) Singer, America, green houses in tropical plants/soil Dominican Republic, see Kirk et al. 2013 (genus accepted), sequence data available, see Baroni et al. 2014 (phylogeny), new sp. see Justo et al. 2015a (Dominican Republic).

Solicoccozyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Piskurozymaceae, Filobasidiales, Tremellomycetes, sexual morph unknown, seven species, type species *S. aeria* (Saito) X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, isolated from soil, cultures and sequence data avalaible, cultures are available, see Liu et al. 2015b (phylogeny), Yurkov et al. 2016, Yurkov and Kurtzman 2019 (new spp.).

Solioccasus Trappe, Osmundson, Manfr. Binder, Castellano & Halling 2013, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *S. polychromus* Trappe, Osmundson, Manfr. Binder, Castellano & Halling, sequestrate, presumably ectomycorrhizal, Australia and Papua New Guinea, sequence data available, see Trappe et al. 2013 (phylogeny, taxonomy).

Sorataea Syd. 1930 (= *Allopuccinia* H.S. Jacks. 1931), Uropyxidaceae, Pucciniales, Pucciniomycetes, eight species, type species *S. amiciae* Syd., biotrophic on Fabaceae, terrestrial, Africa (Ivory Coast), South America (Bolivia, Venezuela), Asia (Indonesia, Philippines), sequence data unavailable, see Kirk et al. 2013 (genus accepted), Ono 2015b (new combination).

Sparassiella Schwarzman 1964, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *S. longistipitata* Schwarzman, wood-rotting, Kazakhstan, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Sparassis Fr. 1819, Sparassidaceae, Polyporales, Agaricomycetes, asexual morph unknown, seven species, type species *S. crispa* (Wulfen) Fr., composed basidioma, wood-rotting (on roots), brown rot, widespread, some species medicinal use (*S. latifolia* Y.C. Dai & Zheng Wang), some species edible (*S. crispa*), see Dai and Yang 2008 (medicinal mushrooms, China), Dai et al. 2010b (edible mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Ryoo et al. 2013 (phylogeny), new spp. see Zhao et al. 2013c (phylogeny, China), Hughes et al. 2014a (phylogeny, USA).

Sparsitubus L.W. Hsu & J.D. Zhao 1980, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *S. nelumbiformis* L.W. Hsu & J.D. Zhao, cyphelloid basdiome, wood-rotting, East Asia, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Dai et al. 2007 (phylogeny, morphology).

Spathulina Pat. 1900, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *S. lamellosa* (Pat.) Pat, South America, sequence data unavailable, see Kirk et al. 2008.

Spencerozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, *incertae sedis*, *incertae sedis*, Microbotryomycetes, sexual morph unknown, one species, type species *S. crocea* (Shifrine & Phaff) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, insect, USA, cultures and sequence data available, see Wang et al. 2015e (taxonomy, phylogeny).

Sphacelotheca de Bary 1884, Microbotryaceae, Microbotryales, Microbotryomycetes, c. 50 species, type species *S. hydropiperis* (Schumach.) de Bary, worldwide, pathogenic, sequence data available, see Wang et al. 2015e (phylogeny, taxonomy).

Sphaerobasidioscypha Agerer 1983, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *S. citrispora* Agerer (current name: *Flagelloscypha austrofilicis* J.A. Cooper), New Zealand, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Sphaerobasidium Oberw. 1965, Hydnodontaceae, Trechisporales, Agaricomycetes, asexual morph unknown, three species, type species *S. minutum* (J. Erikss.) Oberw. ex Jülich, wood decaying, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2006 (phylogeny).

Sphaerobolus Tode 1790, Geastraceae, Geastrales, Agaricomycetes, asexual morph unknown, three species, type species *S. stellatus* Tode, on wood or coprophilous, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Geml et al. 2005 (molecular systematic), Kohler et al. 2015 (genome, evolution).

Sphaerophragmium Magnus 1891, Sphaerophragmiaceae, Pucciniales, Pucciniomycetes, 24 species, type species *S. acaciae* (Cooke) Magnus, biotrophic on Annonaceae, Fabaceae, terrestrial, circumglobal in tropics, species on Annonaceae restricted to Africa and New Guinea, see Beenken and Berndt 2010 (new species, species on Annonaceae), Kirk et al. 2013 (genus accepted), sequence data available, see McTaggart et al. 2015 (phylogeny, Australia).

Sphagnurus Redhead & V. Hofst. 2014, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *S. paluster* (Peck) Redhead & V. Hofstetter, sequence data available, see Redhead and Hofst 2014 (taxonomy), Bellanger et al. 2015 (phylogeny, accepted as a monophyletic genus in Lyophyllaceae).

Sphenorchidium Beenken 2015, *incertae sedis*, Pucciniales, Pucciniomycetes, two species, type species *S. xylopiae* (J.M. Yen & Sulmont) Beenken, asexual morph aecidium-like, biotrophic on Annonaceae, terrestrial, Gabon, Ivory Coast, Sierra Leone, sequence data available, see Beenken and Wood 2015 (taxonomy, phylogeny).

Sphenospora Dietel 1892, Raveneliaceae, Pucciniales, Pucciniomycetes, six species, type species *S. pallida* (G. Winter) Dietel, biotrophic on Annonaceae, Dioscoreaceae, Orchidaceae, Smilacaceae, terrestrial, Africa (Gabon), tropical America (Brazil, Florida, USA, Guatemala, Peru, Venezuela), see Kirk et al. 2013 (genus accepted), sequence data available, see Aime 2006 (phylogeny), Beenken and Wood 2015 (phylogeny).

Spiculogloea P. Roberts 1996, Spiculogloeaceae, Spiculogloeales, Spiculogloeomycetes, sexual and asexual morph known, five species, type species *S. occulta* P. Roberts, mycoparasitic (tremelloid haustorial cells) on crust fungi and heterobasidiomycetes, distribution Europe, Canada? see Bandoni et al. 2002, sequence data available, see Aime et al. 2006 (phylogeny), Bauer et al. 2006 (phylogeny), Aime et al. 2014 (phylogeny), Wang et al. 2015e (phylogeny), new spp. see Schoutteten et al. 2018 (Belgium).

Spongiforma Desjardin, Manfr. Binder, Roekring & Flegel 2009, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *S. thailandica* Desjardin, Manfr. Binder, Roekring & Flegel, morchelliform astipitate, presumably ectomycorrhizal, tropical Asia, sequence data available, see Desjardin et al. 2009, 2011 (taxonomy, new spp., Malaysia).

Spongioides Lázaro Ibiza 1916, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *S. cryptarum* (Bull.) Lázaro Ibiza, Europe (France), sequence data unavailable, see Kirk et al. 2008.

Spongipellis Pat. 1887, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, eight species (needs revision since genus shown to be polyphyletic), type species *S. spumeus* (Sowerby) Pat., poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Tomšovský 2012 (phylogeny, Europe, *S. litschaueri*).

Spongiporus Murrill 1905, Dacryobolaceae, Polyporales, Agaricomycetes, asexual morph unknown, seven species, type species *S. leucospongia* (Cooke & Harkn.) Murrill, poroid hymenophore, wood-rotting, brown rot, widespread, sequence data available, see Ortiz-Santana et al. 2013 (phylogeny, antrodia clade).

Spongispora G. Wu, S.M.L. Lee, E. Horak & Zhu L. Yang 2018, Boletaceae, Boletales, Agaricomycetes, asexual

morph unknown, one species, type species *S. temasekensis* G. Wu, S.M.L. Lee, E. Horak & Zhu L. Yang, stipitate-pileate, presumably ectomycorrhizal, Singapore, sequence data available, see Wu et al. 2018a (taxonomy and phylogeny).

Sporisorium Ehrenb. ex Link 1825, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, 195 species, type species *S. sorghi* Ehrenb. ex Link, plant parasites (flowers) on Poaceae, systemic, widespread, saprobic yeast states on plants, the genus is not monophyletic, cultures available, see Kirk et al. 2013 (genus accepted), sequence data available, see Begerow et al. 2000, 2014, McTaggart et al. 2012a, b, c, Wang et al. 2015c (phylogeny).

Sporobolomyces Kluyver & C.B. Niel 1924 (= *Blastoderma* B. Fisch. & Breback 1894; = *Aessosporon* Van der Walt 1970; = *Sporidiobolus* Nyland 1950, see Aime et al. 2018b), Sporidiobolaceae, Sporidiobolales, Microbotryomycetes, sexual and asexual morphs known, eleven species, type species *S. roseus* Kluyver & C.B. Niel, yeast, worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Wang et al. 2015e (taxonomy and phylogeny), Urbina and Aime 2018 (diversity).

Spumula Mains 1935, Raveneliaceae, Pucciniales, Pucciniomycetes, seven species, type species *S. quadrifida* Mains, biotrophic on Fabaceae, terrestrial, Mexico, Philippines, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Squamanita Imbach 1946, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, ten species, type species *S. schreieri* Imbach, worldwide, parasitic, see Kirk et al. 2013 (genus accepted), sequence data available, see Redhead et al. 1994, Vizzini and Girlanda 1997, Matheny and Griffith 2010 (mycoparasitism), Halama 2016 (Poland).

Stagnicola Redhead & A.H. Sm. 1986, Mythicomycetaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *S. perplexa* (P.D. Orton) Redhead & A.H. Sm., North temperate, see Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny), Vizzini et al. 2019 (phylogeny).

Staheliomyces E. Fisch. 1921, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *S. cinctus* E. Fisch, saprobic, terrestrial, America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Stalpersia Parmasto 2001, Auriscalpiaceae, Russulales, Agaricomycetes, asexual morph unknown, one species, type species *S. orientalis* Parmasto, Europe, wood-decaying, sequence data unavailable, see Kirk et al. 2008.

Stanglomyces Raithelh. 1986, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *S. taxophilus* Raithelh., South America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Staurophallus Mont. 1845, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *S. senegalensis* Mont., terrestrial, Africa, sequence data unavailable, see Kirk et al. 2008.

Steccherichium D.A. Reid 1963, Bondarzewiaceae, Russulales, Agaricomycetes, asexual morph unknown, seven species, type species *S. seriatum* (Lloyd) Maas Geest., worldwide, wood-decaying, sequence data unavailable, see Yuan and Dai 2008a (new record, China), Kirk et al. 2013 (genus accepted), Zmitrovich 2018a.

Steccherinum Gray 1821, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 40 species, type species *S. ochraceum* (Pers.) Gray, varied basidioma, hydnoid hymenophore, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Miettinen et al. 2012 (phylogeny, morphological plasticity), Binder et al. 2013 (phylogeny, Polyporales), new spp. see Yuan and Wu 2012 (morphology, China, East Asia), Hyde et al. 2017b (phylogeny, Brazil), Westphalen et al. 2018 (Europe), new combinations see Miettinen and Ryvarden 2016 (phylogeny, morphology).

Stegiacantha Maas Geest. 1966, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *S. petaloides* (Lloyd) Maas Geest, hydnoid hymenophore, wood-rotting, Madagascar, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Stegocintractia M. Piepenbr., Begerow & Oberw. 1999, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, six species, type species *S. luzulae* (Sacc.) M. Piepenbr., Begerow & Oberw., plant parasite (pedunculi, spikelet) on Juncaceae, North America, possibly South America, Asia, Europe, Greenland, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014, Nasr et al. 2014a, Wang et al. 2015c (taxonomy, phylogeny).

Stemastrum Raf. 1808, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *S. boscii* Raf., sequence data unavailable, see Kirk et al. 2008.

Stephanophallus MacOwan 1880, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *S. woodii* MacOwan, terrestrial, sequence data unavailable, see Kirk et al. 2008.

Stephanopus M.M. Moser & E. Horak 1975, Cortinariaceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *S. azureus* M.M. Moser & E. Horak, South America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Stephanospora Pat. 1914, Stephanosporaceae, Agaricales, Agaricomycetes, asexual morph unknown, six species, type species *S. caroticolor* (Berk.) Pat., worldwide, terrestrial, basidomes sequestrate, see Kirk et al. 2013 (genus accepted), sequence data available, see Lebel et al. 2015 (cryptic diversity, Australasia, new spp.), new spp. see Guevara-Guerrero et al. 2015 (North America).

Stereophlebia Zmitr. 2018, Meruliaceae, Polyporales, Agaricomycetes, asexual morph unknown, monotypic, one species, type species *S. tuberculata* (Berk. & M.A. Curtis) Zmitr., phlebioid basidioma, wood-rotting, white rot, widespread, see Zmitrovich 2018a (taxonomy).

Stereopsis D.A. Reid 1965, Stereopsidaceae, Stereopsidales, Agaricomycetes, asexual morph unknown, 15 species, type species *S. radicans* (Berk.) D.A. Reid, terrestrial, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Sjökvist et al. 2012 (phylogeny), new spp. see Ryvarden 2012c (Costa Rica), Sjökvist et al. 2014 (*S. globosa*, new combination).

Stereostratum Magnus 1899, Pucciniaceae, Pucciniales, Pucciniomycetes, one species, type species *S. corticioides* (Berk. & Broome) H. Magn., biotrophic on Poaceae, terrestrial, China, Japan, see Kirk et al. 2013 (genus accepted), sequence data available.

Stereum Hill ex Pers. 1794, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, c. 40 species, type species *S. hirsutum* (Willd.) Pers., worldwide, wood-decaying, see Kirk et al. 2013 (genus accepted), sequence data available, see Floudas et al. 2012 (genome).

Sterigmatomyces Fell 1966, Agaricostilbaceae, Agaricostilbales, Agaricostilbomycetes, sexual and asexual morphs known, five species, type species *S. halophilus* Fell, yeast, small basidiocarps on plants, worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Wang et al. 2015e (taxonomy and phylogeny).

Sterigmatosporidium G. Kraep. & U. Schulze 1983, Cuniculitremaceae, Tremellales, Tremellomycetes, sexual and asexul morphs known, one species, type species *S. polymorphum* G. Kraep. & U. Schulze, yeast, possibly mycoparasite, on wood, bark beetle, Europe, see Kirk et al. 2013 (genus accepted), cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Stilbotulasnella Oberw. & Bandoni 1982, *incertae sedis*, Cantharellales, Agaricomycetes, asexual morph unknown, one species, type species *S. conidiophora* Bandoni & Oberw., saprobes, Hawaii, genus in need of modern interpretation, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Stilbum Tode 1790, Chionosphaeraceae, Agaricostilbales, Agaricostilbomycetes, asexual morph unknown, c. ten species, type species *S. vulgare* Tode, worldwide, sequence data and cultures unavailable, see Kirk et al. 2013 (genus accepted), Wang et al. 2015e (taxonomy).

Stiptophyllum Ryvarden 1973, Gloeophyllaceae, Gloeophyllales, Agaricomycetes, asexual morph unknown, one species, type species *S. erubescens* (Berk.) Ryvarden, stipitate basidioma, lamellate hymenophore, wood-rotting, brown rot, Neotropical, sequence data unavailable, see de Campos Santana and Loguercio-Leite 2008 (morphology), Kirk et al. 2013 (genus accepted).

Stollia McTaggart & R.G. Shivas 2012, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, five species, type species *S. ewartii* (McAlpine) McTaggart & R.G. Shivas, plant parasites (ovaries) on Andropogoneae (Poaceae), Australia, South America, cultures unavailable, sequence data available, see McTaggart et al. 2012b, Begerow et al. 2014, Wang et al. 2015c (phylogeny).

Strobilomyces Berk. 1851, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 27 species, type species *S. strobilaceus* (Scop.) Berk., stipitate-pileate, ectomycorrhizal, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Han et al. 2018 (biogeography, monograph), Sato et al. 2017 (diversification rate study), new spp. see Sato and Murakami 2009 (Japan), Sato et al. 2011 (Japan), Gelardi et al. 2013b (China), Antonín et al. 2015b (Korea), Ullah et al. 2019 (Pakistan).

Strobilurus Singer 1962, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, ten species, type species *S. conigenoides* (Ellis) Singer, sarotrophic, worldwide, see Shiono et al. 2008 (compounds), Kirk et al. 2013 (genus accepted), sequence data available, see Walther et al. 2005 (phylogney), Garnica et al. 2007 (agarics, phylogeny, basidiospore ultrastructure), Petersen and Hughes 2010 (phylogeny), Osmundson et al. 2013 (DNA barcode), Qin and Yang 2016 (phylogeny).

Stromatocyphella W.B. Cooke 1961, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *S. conglobata* (Burt) W.B. Cooke, on wood, North America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Stropharia (Fr.) Quél. 1872, Strophariaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 20 species, type species *S. aeruginosa* (Curtis) Quél., saprotrophic, worldwide, some species edible, see Bridge et al. 2008 (taxonomy), Cortez and da Silveira 2008 (Brazil), Bruhn et al. 2010 (cultivation), Zhang et al. 2014b (novel lectin), sequence data available, see Matheny et al. 2006 (phylogeny), new spp. see da Silva et al. 2009 (Brazil), Senthilarasu and Singh 2013a (India), Tian and Bau 2014 (China).

Stylina Syd. & P. Syd. 1921, Graphiolaceae, Exobasidiales, Exobasidiomycetes, one species, type species *S. disticha* (Ehrenb. ex Fr.) Syd. & P. Syd., plant parasite (leaves) on *Livistona* (Arecaceae), China, cultures unavailable,

sequence data unavailable, see Begerow et al. 2002, 2014 (taxonomy), Kirk et al. 2013 (genus accepted).

Stypella Möller 1895, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, four species, type species *S. papillata* Möller, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson 2007b (ITS sequence, phylogeny), Spirin et al. 2019a (taxonomy, phylogeny, *S. vermiformis* group).

Stypellopsis Spirin & V. Malysheva 2018, *incertae sedis*, Auriculariales, Agaricomycetes, two species, type species *S. hyperborea* Spirin & V. Malysheva (type species) and *S. farlowii* (Burt) Spirin & K.H. Larss. (previously *Protomerulius farlowii*), North America (USA) and Europe (Norway), see Spirin et al. 2019a (genus introduced, phylogeny).

Subantrodia Audet 2017, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *S. juniperina* (Murrill) Audet, wood-rotting, sequence data available, see Ortiz-Santana et al. 2013 (antrodia clade of Polyporales, phylogeny).

Subulicium Hjortstam & Ryvarden 1979, *incertae sedis*, Hymenochaetales, Agaricomycetes, asexual morph unknown, three species, type species *S. lautum* (H.S. Jacks.) Hjortstam & Ryvarden, worldwide, see Kirk et al. 2013 (genus accepted), sequence data avaiable, see Langer 2002 (phylogeny).

Subulicystidium Parmasto 1968, Hydnodontaceae, Trechisporales, Agaricomycetes, asexual morph unknown, 20 species, type species *S. longisporum* (Pat.) Parmasto, wood-decaying, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Gorjón et al. 2012b (Patagonian Andes), see Ordynets et al. 2018 (phylogeny, keys)

Sugitazyma A.M. Yurkov, X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Trimorphomycetaceae, Tremellales, Tremellomycetes, sexual morph unknown, one species, type species *S. miyagiana* (Nakase, Itoh, Takem. & Bandoni) X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, on fir (*Abies firma*), Japan, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Suillellus Murrill 1909, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, 23 species, type species *S. luridus* (Schaeff.) Murrill, stipitate-pileate, ectomycorrhizal, worldwide, sequence data available, new spp. see Wu et al. 2016f (China).

Suillosporium Pouzar 1958, Botryobasidiaceae, Cantharellales, Agaricomycetes, asexual morph unknown, four species, type species *S. cystidiatum* (D.P. Rogers) Pouzar, saprobic, wood-rotting, worldwide, genus in need of modern interpretation, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Suillus Gray 1821, Suillaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 60 species, type species *S. luteus* (L.) Roussel, ectomycorrhizal with Pinaceae, widespread (north temperate, introduced in southern hemisphere), some species edible (*S. acidus* (Peck) Singer), some medicinal use, (*S. bovinus* (L.) Roussel), see Dai and Yang 2008 (medicinal mushrooms, China), Dai et al. 2010b (edible mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Nguyen et al. 2016 (phylogeny), Min et al. 2014 (Korean *Suillus*), Zhang et al. 2017c (phylogeny), new spp. see Bruns et al. 2010 (California and Oregon, USA), Verma and Sudhakara 2014 (India), Sarwar et al. 2015 (Pakistan), Verma and Reddy 2015a, b (India), Qi et al. 2016 (northeast China), Shi et al. 2016 (China).

Sulzbacheromyces B.P. Hodk. & Lücking 2014, Lepidostromataceae, Lepidostromatales, Agaricomycetes, asexual morph unknown, six species, type species *S. caatingae* (Sulzbacher & Lücking) B.P. Hodk. & Lücking, terrestrial, tropical Africa, Asia and America, sequence data available, see Hodkinson et al. 2014 (phylogeny, Mexico), new spp. see Liu et al. 2017a (China).

Sutorius Halling, Nuhn & N.A. Fechner 2012, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *S. eximius* (Peck) Halling, M. Nuhn & Osmundson, stipitate-pileate, ectomycorrhizal, worldwide, DNA sequence data available, see Halling et al. 2012a (phylogeny), Chai et al. 2019 (China), amended by Wu et al. 2016f to include *Neoboletus*, or should be restricted to *Sutorius* sensu Halling et al. 2012a (Raspé and Vadthanarat, unpubl.).

Symmetrospora Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, Symmetrosporaceae, *incertae sedis*, Cystobasidiomycetes, sexual morph unknown, six species, type species *S. gracilis* (Derx) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, worldwide, cultures and sequence data available, see Wang et al. 2015e (taxonomy, phylogeny).

Sympodiomycopsis Sugiy., Tokuoka & Komag. 1991, *incertae sedis*, Microstromatales, Exobasidiomycetes, three species, type species *S. paphiopedili* Sugiy., Tokuoka & Komag., known only from saprobic states, plant material, see Kurtzman et al. 2011 (taxonomy), Kirk et al. 2013 (genus accepted), cultures available, sequence data available, see Begerow et al. 2001, 2014 (phylogeny, taxonomy), Wang et al. 2015c (phylogenetic classification of yeasts, Ustilaginomycotina), Kijpornyongpan and Aime 2017 (validation).

Syzygospora G.W. Martin 1937, Filobasidiaceae, Filobasidiales, Tremellomycetes, asexual morphs unknown, two species, type species *S. alba* G.W. Martin, yeast, mycoparasitic, worldwide, see Kirk et al. 2013 (genus accepted), cultures and sequence data available, see Millanes et al.

2011 (phylogeny), Liu et al. 2015b (taxonomy and phylogeny).

Szczepkamyces Zmitr. 2018, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, monotypic, type species *S. campestris* (Quél.) Zmitr., resupinate porioid basidioma, wood-rotting, white rot, widespread, see Zmitrovich 2018a (taxonomy).

Taeniospora Marvanová 1977, Atheliaceae, Atheliales, Agaricomycetes, asexual morph *Fibulomyces* Jülich 1972, two species, type species *T. gracilis* Marvanová, Czech Republic, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Taiwanofungus Sheng H. Wu, Z.H. Yu, Y.C. Dai & C.H. Su 2004, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *T. camphoratus* (M. Zang & C.H. Su) Sheng H. Wu, Z.H. Yu, Y.C. Dai & C.H. Su, China, medicinal use, see Hsieh et al. 2010 (natural products), Geethangili and Tzeng 2011 (bioactive compounds), sequence data available, see Wu et al. 2004 (phylogeny), Yang et al. 2018a (genome and transcriptome analyses, cultivation).

Taiwanoporia T.T. Chang & W.N. Chou 2003, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, one species, type species *T. amylospora* T.T. Chang & W.N. Chou, China, sequence data unavailable, see Kirk et al. 2008.

Takashimella Q.M. Wang 2015, Tetragoniomycetaceae, Trichosporonales, Tremellomycetes, sexual morph unknown, four species, type species *T. formosensis* (Nakase, Tsuzuki & M. Takash.) Q.M. Wang, yeast, worldwide, cultures and sequence data available, see Wang and Wang 2015 (ballistoconidium-forming yeasts, Trichosporonales), Liu et al. 2015b (taxonomy and phylogeny).

Tapinella E.-J. Gilbert 1931 (= *Sarcopaxillus* Zmitr., Malysheva & E.F. Malysheva 2004), Tapinellaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *T. panuoides* (Batsch) E.-J. Gilbert, see Kirk et al. 2013 (genus accepted), sequence data available, see Garnica et al. 2007 (phylogeny), Van der Linde and Haller 2013 (ecology).

Tausonia Babeva 1998, Mrakiaceae, Cystofilobasidiales, Tremellomycetes, sexual and asexual morphs known, three species, type species *T. pamirica* Babeva, yeast, widespread, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny), Kachalkin et al. 2019 (new spp.).

Tectella Earle 1909, Mycenaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *T. patellaris* (Fr.) Murrill, worldwide, see Seok et al. 2011 (Korea), Jančovičová et al. 2012 (Slovakia), Kirk et al. 2013 (genus accepted), sequence data available, see Moncalvo et al. 2002 (phylogeny).

Telomapea G.F. Laundon 1967 (= *Mapea* Boedijn 1957), Chaconiaceae, Pucciniales, Pucciniomycetes, one species, type species *T. inocarpi* (Racib.) G.F. Laundon, biotrophic on *Inocarpus* (Fabaceae), terrestrial, Indonesia, sequence data unavailable, see Kirk et al. 2008.

Tengioboletus G. Wu & Zhu L. Yang 2016, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *T. reticulatus* G. Wu & Zhu L. Yang, basidioma stipitate-pileate with tubular hymenophore, central China, sequence data available, see Wu et al. 2016f (taxonomy, China), new spp. see Zeng et al. 2018 (China).

Tephrocybe Donk 1962, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 47 species, type species *T. rancida* (Fr.) Donk, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Hofstetter et al. 2014 (phylogeny, Lyophyllaceae), Bellanger et al. 2015 (phylogeny), new spp. see Picillo 2014 (Italy).

Tephrocybella Picillo, Vizzini & Contu 2015, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *T. griseonigrescens* Picillo, Vizzini & Contu, Italy, basidioma collybioid, sequence data available, see Crous et al. 2015a (taxonomy), Hyde et al. 2017b (taxonomy).

Tephroderma Contu & Musumeci 2014, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *T. fuscopallens* Musumeci & Contu, France, Turkey, see Sesli and Topçu 2016 (Turkey), sequence data available, see Musumeci and Contu 2014b (taxonomy).

Terana Adans. 1763, Phanerochaetaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *T. coerulea* (Lam.) Kuntze, corticioid basidioma, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Floudas and Hibbett 2015 (phylogeny, *Phanerochaete s. l.*).

Terenodon Maas Geest. 1971, Gomphaceae, Gomphales, Agaricomycetes, asexual morph unknown, one species, type species *T. serenus* Maas Geest., Japan, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Termiticola E. Horak 1979, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *T. rubescens* E. Horak, Papua New Guinea, Malaysia, on termite nest, see Kirk et al. 2013 (genus accepted), sequence data unavailable, genus in need of revision.

Termitomyces R. Heim 1942 (= *Termitosphaera* Cif. 1935 *fide* Art. 59.1), Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph previously known in *Termitosphaera* Cif. 1935, c. 34 species, type species *T. striatus* (Beeli) R. Heim, Africa, Southeast Asia, in nests of Macrotermitinae, edible, termite mushroom (*T. eurrhizus* (Berk.) R. Heim), see Hall et al. 2003 (edible mushrooms),

Mondal et al. 2008 (chemical analysis), Dai et al. 2010b (edible mushrooms, China), Wei et al. 2009 (China, key, morphology), Osiemo et al. 2010 (Africa), Kirk et al. 2013 (genus accepted), sequence data available, see Nobre et al. 2011 (genetic population structure), Sawhasan et al. 2011 (Thailand), Siddiquee et al. 2012 (*T. heimii*), Tibuhwa 2012 (Tanzania), Karun and Sridhar 2013 (India), Hofstetter et al. 2014 (phylogeny, Lyophyllaceae), Rahmad et al. 2014 (proteomic analysis, *T. heimii*), Mossebo et al. 2017 (phylogeny), new spp. see Mossebo et al. 2011 (Cameroun), Takahashi et al. 2016 (Japan).

Testicularia Klotzsch 1832, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, three species, type species *T. cyperi* Klotzsch, plant parasites (flowers, spikelets) on *Rhynchospora* spp. (Cyperaceae), West Africa, North America, South America, Caribbean Basin, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Tetragoniomyces Oberw. & Bandoni 1981, Rhynchogastremaceae, Trichosporonales, Tremellomycetes, asexual and sexual morphs known, one species, type species *T. uliginosus* (P. Karst.) Oberw. & Bandoni, mycoparasite, on wood, Europe, on wood, see Kirk et al. 2013 (genus accepted), sequence data available, see Millanes et al. 2011 (phylogeny), Liu et al. 2015b (taxonomy and phylogeny), Pontes et al. 2017 (sequence data).

Tetrapyrgos E. Horak 1987, Marasmiaceae, Agaricales, Agaricomycetes, asexual morph unknown, 18 species, type species *T. atrocyanea* (Métrod) E. Horak, saprophytic, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Honan et al. 2015 (taxonomy, phylogeny, type studies, new spp.), Desjardin and Perry 2017 (type study).

Thanatephorus Donk 1956, Ceratobasidiaceae, Cantharellales, Agaricomycetes, asexual morph *Rhizoctonia* DC. 1805, 12 speceis, type species *T. cucumeris* (A.B. Frank) Donk, worldwide, pathogenetic, see Willocquet and Savary 2011 (rice sheath blight), sequence data available, see González et al. 2012 (genetic diversity, *T. cucumeris*), Oberwinkler et al. 2013a (*Ceratobasidium-Rhizoctonia* complex).

Thecaphora Fingerh. 1836, Glomosporiaceae, Urocystidales, Ustilaginomycetes, 61 species, type species *T. seminis-convolvuli* Liro, plant parasites (various parts of host plant) on dicots, North America, Asia, Australia, Europe, see Kirk et al. 2013 (genus accepted), Frantzeskakis et al. 2017 (life cycle, *T. thlaspeos*), cultures available, sequence data available, see Vánky et al. 2008 (taxonomy), Conforto et al. 2013 (molecular data), Begerow et al. 2014 (taxonomy), Vasighzadeh et al. 2014 (phylogeny, *T. schwarzmaniana*), Wang et al. 2015c (phylogeny, taxonomy), new spp. see Roets et al. 2008 (South Africa), Crous et al. 2018b (Australia), Kruse et al. 2018 (Greece).

Thekopsora Magnus 1875, Pucciniastraceae, Pucciniales, Pucciniomycetes, seven species, type species *T. areolata* (Fr.) Magnus, biotrophic on Betulaceae, Cornaceae, Ericaceae, Rosaceae, terrestrial, Asia (China, Japan), Europoe, Eurasia, North America, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Yang et al. 2014, 2015a (phylogeny, China), Aime et al. 2018a (phylogeny, evolution with host, Pucciniales).

Thelephora Ehrh. ex Willd. 1787, Thelephoraceae, Thelephorales, Agaricomycetes, asexual morph unknown, c. 50 species, type species *T. terrestris* Ehrh., ectomycorrhizal, worldwide, edible when basidiomas are young, see Sha et al. 2008 (genetic diversity), Norikura et al. 2011 (anticancer activities of *T. aurantiotincta*), Kirk et al. 2013 (genus accepted), sequence data available, see Ramírez-López et al. 2013, 2015 (phenotypic plasticity of basidioma, phylogeny, cryptic species), Wang et al. 2017b (mitochondrial genomes, *T. ganbajun*), Zmitrovich et al. 2018b (phylogeny, new combinations), new spp. see Vizzini et al. 2016a (Dominican Republic).

Thelephorella P. Karst. 1889, *incertae sedis*, Thelephorales, Agaricomycetes, asexual morph unknown, one species, type species *T. brasiliensis* P. Karst., wood-decaying, South America, sequence data unavailable, see Kirk et al. 2008.

Theleporus Fr. 1847, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, nine species, type species *T. cretaceus* Fr., poroid hymenophore, wood-rotting, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Zhou and Dai 2012a (China), Yuan 2015 (China), new combination, see Ariyawansa et al. 2015 (Venezuela).

Thermophymatospora Udagawa, Awao & Abdullah 1986, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one specie, type species *T. fibuligera* Udagawa, Awao & Abdullah, wood-rotting, sequence data unavailable, see Kirk et al. 2008.

Thujacorticium Ginns 1988, Cyphellaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *T. mirabile* Ginns, Canada, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Tilletia Tul. & C. Tul. 1847, Tilletiaceae, Tilletiales, Exobasidiomycetes, 179 species, type species *T. caries* (DC.) Tul. & C. Tul., plant parasites (ovaries, leaves) of Poaceae, widespread, cultures available, see Kirk et al. 2013 (genus accepted), sequence data available, see Begerow et al. 2014 (taxonomy), Wang et al. 2015c (taxonomy, phylogeny).

Tilletiaria Bandoni & Johri 1972, Tilletiariaceae, Georgefischeriales, Exobasidiomycetes, sexual and asexual morphs known, one species, type species *T. anomala* Bandoni & B.N. Johri, known only from saprobic states, see Kurtzman et al. 2011 (taxonomy), Kirk et al. 2013

(genus accepted), cultures available, sequence data available, see Bauer et al. 2001a (taxonomy), Begerow et al. 2014 (taxonomy), Wang et al. 2015c (taxonomy, phylogeny).

Tilletiopsis Derx 1948, Entylomataceae, Entylomatales, Exobasidiomycetes, sexual morph *Entyloma* de Bary 1874, *Melanotaenium* de Bary 1874, three species, type species *T. washingtonensis* Nyland, worldwide, known only from saprobic states, plant pathogen, see Hamamoto et al. 2000, Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Baric et al. 2010 (white haze, Italy), Boekhout 2011 (taxonomy), Begerow et al. 2014 (taxonomy), Wang et al. 2015c (taxonomy, phylogeny), Prencipe et al. 2016 (Croatia).

Tinctoporellus Ryvarden 1979, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, four species, type species *T. epimiltinus* (Berk. & Broome) Ryvarden, resupinate basidioma, poroid hymenophore, wood-rotting, widespread (pantropical), see Kirk et al. 2013 (genus accepted), sequence data available, see Justo et al. 2017 (phylogeny, Polyporales), new spp. see Yuan and Wan 2012 (phylogeny, China).

Titaeella G. Arnaud ex K. Ando & Tubaki 1985, *incertae sedis*, *incertae sedis*, Agaricomycetes, one species, type species *T. capnophila* G. Arnaud ex K. Ando & Tubaki, Europe, Japan, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Tolyposporella G.F. Atk. 1897, Tilletiariaceae, Georgefischeriales, Exobasidiomycetes, six species, type species *T. chrysopogonis* G.F. Atk., plant parasites (leaves, leaf sheats) on Poaceae, maybe also Eriocaulaceae, Africa, North America, South America, Australasia, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Bauer et al. 2001b (taxonomy, phylogeny), Begerow et al. 2014 (taxonomy), Wang et al. 2015c (taxonomy, phylogeny).

Tolyposporium Woronin ex J. Schröt. 1887, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, five species, type species *T. junci* (J. Schröt.) Woronin ex J. Schröt., plant parasites (various plant parts) on genera *Juncus* (Juncaceae) and *Schoenus*, *Ficinia* (Cyperaceae), North America, Australasia, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Piepenbring et al. 1999 (phylogeny), Begerow et al. 2014 (taxonomy), Wang et al. 2015c (taxonomy, phylogeny).

Tomentella Pers. ex Pat. 1887, Thelephoraceae, Thelephorales, Agaricomycetes, asexual morph unknown, c. 100 species, type species *T. ferruginea* (Pers.) Pat., ectomycorrhizal, worldwide, see Kaur et al. 2010 (India), Kirk et al. 2013 (genus accepted), sequence data available, see Geml et al. 2012b, 2014a, b (Arctic, phylogeny, biogeography, coastal dunes, Europe, Andean forests, Argentina), Morgado et al. 2015, 2016 (arctic tundra, Alaska, ecology), Alvarez-Manjarrez et al. 2016 (phylogeny, Mexico), Zmitrovich et al. 2018b (phylogeny), new spp. see Yorou and Agerer 2008 (phylogeny, West Africa), Yorou et al. 2012a, b (West Africa), Kuhar et al. 2017 (Patagonian Andes forests).

Tomentellopsis Hjortstam 1970, Thelephoraceae, Thelephorales, Agaricomycetes, asexual morph unknown, eight species, type species *T. echinospora* (Ellis) Hjortstam, ectomycorrhizal, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson 2007b (phylogeny).

Tomophagus Murrill 1905, Polyporaceae, Polyporales, Agaricomycetes, asexual morph *Thermophymatospora* Udagawa, Awao & Abdullah 1986, two species, type species *T. colossus* (Fr.) Murrill, poroid hymenophore, wood-rotting, white rot, widespread (America, Vietnam), sequence data available, see Le et al. 2012 (new sp., phylogeny, Vietnam, genus accepted).

Trachyspora Fuckel 1861 (= *Trachysporella* Syd. 1921), Phragmidiaceae, Pucciniales, Pucciniomycetes, five species, type species *T. alchemillae* (Pers.) Fuckel, biotrophic on Rosaceae (*Alchemilla*), Euphorbiaceae, terrestrial, Europe (Switzerland), Africa (Kenya), Indonesia, Brazil, see Kirk et al. 2013 (genus accepted), sequence data available, see Maier et al. 2003 (phylogeny), Aime 2006 (phylogeny).

Tracya Syd. & P. Syd. 1901, Doassansiaceae, Doassansiales, Exobasidiomycetes, two species, type species *T. lemnae* (Setch.) Syd. & P. Syd., plant parasites on vegetative parts of Hydrocharitaceae and Lemnaceae, Europe, North America, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Trametes Fr. 1836, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 70 species, type species *T. suaveolens* (L.) Fr., poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), some species medicinal use, see Zmitrovich et al. 2012 (review, medicinal properties, *Trametes* spp.), Wasser 2017 (medicinal mushrooms, human clinical studies), sequence data available, see Tomšovský et al. 2006 (phylogeny, Europe), Zmitrovich and Malysheva 2013 (phylogeny), Carlson et al. 2014 (phylogeny), new spp. see Ryvarden et al. 2009 (morphology, Neotropics), Læssøe and Ryvarden 2010b (morphology, Ecuador), Li and Cui 2010 (morphology, Southwest China), Ryvarden 2012a, b, 2015b (morphology, Costa Rica, Neotropics, Brazil), new combinations, see Justo and Hibbett 2011 (phylogeny), Malysheva and Zmitrovich 2011 (*Trametes hirsuta*-complex), Welti et al. 2012 (phylogeny), Spirin et al. 2015a (morphology), Ryvarden 2016c (morphology).

Trametopsis Tomšovský 2008, Irpicaceae, Polyporales, Agaricomycetes, asexual morph unknown, four species,

type species *T. cervina* (Schwein.) Tomšovský, poroid hymenophore, wood-rotting, white rot, widespread, sequence data available, see Tomšovský 2008 (phylogeny, Europe), new sp. see Gómez-Montoya et al. 2017b (new combinations, phylogeny, Neotropics), Zmitrovich 2018a (taxonomy)

Tranzschelia Arthur 1906 (= *Polythelis* Arthur 1906; = *Lipospora* Arthur 1942), Uropyxidaceae, Pucciniales, Pucciniomycetes, 19 species, type species *T. cohaesa* (Long) Arthur, biotrophic on Ranunculaceae (microcyclic or macrocyclic) and heteroecious macrocyclic species on Ranunculaceae (aecial host) and Prunoideae (telial host), terrestrial, see Kirk et al. 2013 (genus accepted), sequence data available, see Wingßeld et al. 2004 (phylogeny), Scholler et al. 2014 (new species, key to American species, *T. thalictri* is probably a species complex).

Tranzscheliella Lavrov 1936, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, 17 species, type species *T. otophora* Lavrov, plant parasites (aborted flowers, stems) on Poaceae, Africa, Australia, see Kirk et al. 2013 (genus accepted), cultures available, sequence data available, Kellner et al. 2011 (phylogeny, grass smuts), Begerow et al. 2014 (taxonomy), Wang et al. 2015c (taxonomy, phylogeny).

Trappea Castellano 1990, Trappeaceae, Hysterangiales, Agaricomycetes, asexual morph unknown, three species, type species *T. darkeri* (Zeller) Castellano, China, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Hosaka et al. 2008 (phylogeography), new spp. see Gómez-Reyes et al. 2014 (Mexico).

Trechinothus E.C. Martini & Trichiès 2004, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, one species, type species *T. smardae* (Pilát) E.C. Martini & Trichiès, Europe, sequence data unavailable, see Kirk et al. 2008.

Trechispora P. Karst. 1890, Hydnodontaceae, Trechisporales, Agaricomycetes, asexual morph unknown, 48 species, type species *T. onusta* P. Karst., wood-decaying, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Rosenthal et al. 2017 (ecology, corticioid fungi in North American pinaceous forests).

Tremella Pers. 1794, Tremellaceae, Tremellales, Tremellomycetes, sexual and asexual morphs known, type species *T. mesenterica* Retz., more than 500 species described (mostly old doubtful names), 100 species accepted, some species edible, see Dai et al. 2010b (Chinese edible mushrooms), Kirk et al. 2013 (genus accepted), presently restricted to *T. mesenterica* lineage (other species temporarily accommodated in the genus), asexual morph as yeast, mycoparasitic, lichenicolous, worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Findley et al. 2009 (phylogeny), Millanes et al. 2011 (phylogeny), Liu et al. 2015b (phylogeny), new spp. see Millanes et al. 2012 (Sweden, USA), Ariyawansa et al. 2015 (USA), Diederich et al. 2015 (Peru), Lindgren et al. 2015 (associated with lichenized ascomycete), Malysheva et al. 2015b (Russia), Millanes et al. 2015 (Finland, Greenland, Norway, Russia, Svalbard, and Sweden), Zamora et al. 2017, 2018 (Europe, USA), Zhao et al. 2019 (China).

Tremellacantha Jülich 1980, *incertae sedis*, Auriculariales, Agaricomycetes, asexual morph unknown, one species, type species *T. sclerodontia* (Mont. & Berk.) Jülich [current name: *Protohydnum sclerodontium* (Mont. & Berk.) Hjortstam & Spooner], sequence data unavailable, see Kirk et al. 2008.

Tremellina Bandoni 1986, *incertae sedis*, Tremellales, Tremellomycetes, sexual morph *Cuniculitrema* J.P. Samp. & R. Kirschner 2001, one species, type species *T. pyrenophila* Bandoni, on fungal ascocarps, North America, sequence data unavailable, see Kirk et al. 2008.

Tremellodendropsis (Corner) D.A. Crawford 1954, Tremellodendropsidaceae, Tremellodendropsidales, Agaricomycetes, asexual morph unknown, eight species, type species *T. tuberosa* (Grev.) D.A. Crawford, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Berbee et al. 2016 (phylogeny).

Tremellogaster E. Fisch. 1924, Diplocystidiaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *T. surinamensis* E. Fisch., Surinam, Guyana, ectomycorrhizal, see Kirk et al. 2013 (genus accepted), sequence data available, see Wilson et al. 2012a (evolution).

Tremelloscypha D.A. Reid 1979, Sebacinaceae, Sebacinales, Agaricomycetes, asexual morph unknown, four species, type species *T. australiensis* D.A. Reid, Australia, Jamaica, some species edible (*T. gelatinosa* (Murrill) Oberw. & K. Wells), see Bandala et al. 2014 (Mexico), Kirk et al. 2013 (genus accepted), sequence data available, see Bandala et al. 2012a (Mexico, morphology), Oberwinkler et al. 2014 (phylogeny, Sebacinales).

Tretomyces K.H. Larss., Kotir. & Saaren. 2011, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, two species, type species *T. lutescens* (J. Erikss. & Ryvarden) K.H. Larss., Kotir. & Saaren., sequence data available, see Kotiranta et al. 2011 (taxonomy).

Tretopileus B.O. Dodge 1946, Corticiaceae, Corticiales, Agaricomycetes, asexual morph unknown, three species, type species *T. opuntiae* B.O. Dodge, probably plant parasitic, USA, Asia, see Kirk et al. 2013 (genus accepted), sequence data available, see Okada et al. 1998 (phylogeny), Jayawardena et al. 2019 (phylogeny, updated notes).

Trichaptum Murrill 1904, *incertae sedis*, Hymenochaetales, Agaricomycetes, asexual morph unknown, 27 species, type species *T. trichomallum* (Berk. & Mont.) Murrill,

worldwide, wood-decaying, some species medicinal use (*T. abietinum* (Pers.: Fr) Ryvarden), see Dai and Yang 2008 (medicinal mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Dai et al. 2009a (monograph, China, new spp.).

Trichocintractia M. Piepenbr. 1995, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, one species, type species *T. utriculicola* (Henn.) M. Piepenbr., plant parasite (spikelets) on *Rhynchospora* spp. (Cyperaceae), widespread in tropical regions, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014 (taxonomy), Nasr et al. 2014a (phylogeny).

Trichocybe Vizzini 2010, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *T. puberula* (Kuyper) Vizzini, Northwestern Europe, sequence data available, see Vizzini et al. 2010a (taxonomy).

Tricholoma (Fr.) Staude 1857, Tricholomataceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 210 species, type species *T. flavovirens* Alb. & Schwein., worldwide, ectomycorrhizal, some species edible, matsutake (*T. matsutake* (S. Ito & S. Imai) Singer), see Hall et al. 2003 (edible mushrooms), Dai et al. 2010b (Chinese edible mushrooms), Kirk et al. 2013 (genus accepted), You et al. 2013 (antioxidant and antitumour activities), sequence data available, see Mouhamadou et al. 2008 (molecular evolution), Jargeat et al. 2010 (*T. scalpturatum* species complex), Yu et al. 2011 (phylogeny), Ota et al. 2012 (matsutake mushrooms), Murata et al. 2013a (section *Caligata*), Moukha et al. 2013 (*T. equestre* species complex), Hosen et al. 2016c (*T. sinoacerbum*), Heilmann-Clausen et al. 2017 (monograph, Europe), new spp. see Christensen and Heilmann-Clausen 2009 (Europe), Park et al. 2014a (Korea), Yang et al. 2017b (Eastern Himalaya), Ovrebo and Hughes 2018 (New Mexico and Colorado).

Tricholomella Zerova ex Kalamees 1992, Lyophyllaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *T. constricta* (Fr.) Zerova ex Kalamees, East Europe, East Asia, sequence data available, see Hofstetter et al. 2014 (phylogeny, Lyophyllaceae).

Tricholomopsis Singer 1939, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. 33 species, type species *T. rutilans* (Schaeff.) Singer, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Razaq et al. 2012 (*T. flammula*), new spp. see Vauras 2009 (Estonia), Holec and Kolařík 2013c (Europe), Olariaga et al. 2015a (cryptic speciation), Cooper and Park 2016 (New Zealand), Holec et al. 2019 (Europe).

Tricholosporum Guzmán 1975, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, seven species, type species *T. goniospermum* (Bres.) Guzmán ex T.J. Baroni, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Liu et al. 2016b (China), Angelini et al. 2017 (*T. goniospermum*, phylogeny, Tricholomatineae), new spp. see Angelini et al. 2014 (Dominican Republic), Xu et al. 2018 (China).

Trichopsora Lagerh. 1892, Pucciniosiraceae, Pucciniales, Pucciniomycetes, one species, type species *T. tournefortiae* Lagerh., biotrophic on Boraginaceae (*Tournefortia*), terrestrial, Ecuador, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Trichosporon Behrend 1890, Trichosporonaceae, Trichosporonales, Tremellomycetes, sexual morph unknown, 12 species, type species *T. ovoides* Behrend, yeast, on wood, soil, human skin, worldwide, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (taxonomy), Takashima et al. 2018 (taxonomy, phylogeny).

Trichosporonoides Haskins & J.F.T. Spencer 1967, *incertae sedis*, *incertae sedis*, Tremellomycetes, sexual morph unknown, six species, type species *T. oedocephalis* Haskins & J.F.T. Spencer, worldwide, erythritol-producing, see Sawada et al. 2009 (erythritol production), Kirk et al. 2013 (genus accepted), sequence data available, see Rosa et al. 2009 (phylogeny).

Trigonosporomyces Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, *incertae sedis*, *incertae sedis*, Microbotryomycetes, sexual morph unknown, one species, type species *T. hylophilus* (Van der Walt, D.B. Scott & Klift) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, isolated from insects, South Africa, cultures and sequence data available, see Wang et al. 2015e (taxonomy, phylogeny).

Trimitiella Dhingra 2008, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, one species, type species *T. indica* Dhingra, India, sequence data unavailable, see Dhingra and Singh 2008a (validation).

Trimorphomyces Bandoni & Oberw. 1983, Trimorphomycetaceae, Tremellales, Tremellomycetes, sexual and asexual morphs known, two species, type species *T. papilionaceus* Oberw. & Bandoni, yeast, basidiocarps gelatinous, mycoparasite, widespread, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Triodiomyces McTaggart & R.G. Shivas 2012, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, six species, type species *T. altilis* (Syd.) McTaggart & R.G. Shivas, plant parasites (columns or inflorescence) on *Triodia* spp. (Poaceae), Australia, saprobic yeast states on plants, cultures available, sequence data available, see McTaggart et al. 2012b (taxonomy), Begerow et al. 2014 (taxonomy), Wang et al. 2015c (taxonomy, phylogeny).

Triphragmiopsis Naumov 1914 (= *Nyssopsorella* Syd. 1921), Raveneliaceae, Pucciniales, Pucciniomycetes, three species, type species *T. jeffersoniae* Naumov, biotrophic on Berberidaceae, Pinaceae, Ranunculaceae, China, Europe,

Russia, Korea, sequence data unavailable, see Kirk et al. 2013 (genus accepted), Ono 2013b (microcyclic life cycle of *T. jeffersoniae*).

Triphragmium Link 1825, Raveneliaceae, Pucciniales, Pucciniomycetes, seven species, type species *T. ulmariae* (DC.) Link, biotrophic on Fabaceae, Rosaceae, terrestrial, Europe, Japan, see Kirk et al. 2013 (genus accepted), sequence data availale, see Yun et al. 2011 (phylogeny, *Frommeëlla* revisited).

Tritirachium Limber 1940, Tritirachiaceae, Tritirachiales, Tritirachiomycetes, four species, type species *T. dependens* Limber, worldwide, some species pathogenic for hunman, see Moraes et al. 2010 (*T. oryzae*), sequence data available, see Vu et al. 2019 (DNA sequences), sequence data available, see Beguin et al. 2012 (phylogeny), new spp. see Manohar et al. 2014 (Arabian sea).

Trogia Fr. 1836, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, c. 94 species, type species *T. aplorutis* (Mont.) Fr., tough texture with clitocyboid to omphalinoid habit and possessing the ability of reviving *in situ*, worldwide, saprotrophic, some species lethal, see Shi et al. 2012 (China), Zhou et al. 2012 (compounds), Kirk et al. 2013 (genus accepted), sequence data available, see Kumar and Manimohan 2009a (India), Mi et al. 2016 (*T. venenata*), new spp. see Yang et al. 2012b (China), Dutta et al. 2017 (India).

Tropicoporus L.W. Zhou, Y.C. Dai & Sheng H. Wu 2015, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, twelve species, type species *T. excentrodendri* L.W. Zhou & Y.C. Dai, sequence data available, see Zhou et al. 2016e (morphology), new spp. see Coelho et al. 2016 (Brazil), Wu et al. 2015c (Thailand).

Trullella Zmitr. 2018, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, six species, type species *T. dentipora* (Ryvarden & Iturr.) Zmitr., wood-decaying, worldwide, sequence data available, see Miettinen and Ryvarden 2016 (taxonomy, phylogeny, as *Trulla*), Zmitrovich 2018a (taxonomy).

Truncocolumella Zeller 1939, Suillaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *T. citrina* Zeller, ectomycorrhizal, North America, see Kirk et al. 2013 (genus accepted), sequence data available, see Grubisha et al. 2001 (phylogeny).

Truncospora Pilát 1953, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, 23 species, type species *T. ochroleuca* (Berk.) Pilát (current namne: *Perenniporia ochroleucus* Berk), poroid hymenophore, wood-rotting, white rot, widespread, sequence data available, see Zhao et al. 2016d (phylogeny, North America), new spp. see Decock 2011 (morphology, new combination, São Tome, Africa), Spirin et al. 2015b (phylogeny, East Asia, Caribbean, Mexico, USA, Spain), new combinations see Zmitrovich 2018a (taxonomy).

Tsugacorticium Nakasone & Burds. 2011, *incertae sedis*, Hymenochaetales, Agaricomycetes, asexual morph unknown, one species, type species *T. kenaicum* Nakasone & Burds., Alaska, sequence data available, see Nakasone and Burdsall 2012 (monograph).

Tubaria (W.G. Sm.) Gillet 1876, Tubariaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 21 species, type species *T. furfuracea* (Pers.) Gillet, see Kirk et al. 2013 (genus accepted), sequence data available, see Matheny et al. 2007a (phylogeny), Zhang and Bau 2010 (China), Petersen et al. 2010 (phylogeny, accepted in Tubariaceae), Antonín et al. 2012a (Czech Republic), Horak 2018 (monograph, New Zealand, new spp.), new spp. see Latha et al. 2016a (India).

Tubariella E. Horak & Hauskn. 2002, Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *T. rhizophora* E. Horak & Hauskn., Papua New Guinea, sequence data unavailable, see Kirk et al. 2008.

Tubariomyces Esteve-Rav. & Matheny 2010, Inocybaceae, Agaricales, Agaricomycetes, asexual morph unknown, three species, type species *T. inexpectatus* (M. Villarreal, Esteve-Rav., Heykoop & E. Horak) Esteve-Rav. & Matheny, Mediterranean Europe, Northern Africa, basidioma tubarioid, sequence data available, see Alvarado et al. 2010 (taxonomy), new spp. see Vizzini et al. 2013b (Italy), Matheny and Bougher 2017 (Australia).

Tubariopsis R. Heim 1931, Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *T. torquipes* R. Heim, Madagascar, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Tuberculina Tode ex Sacc. 1880, Helicobasidiaceae, Helicobasidiales, Pucciniomycetes, c. 26 species, type species *T. persicina* (Ditmar) Sacc. [current name: *Helicobasidium purpureum* (Tul.) Pat.], worldwide, sequence data available, new spp. see Zhao et al. 2017d (China).

Tubosaeta E. Horak 1967, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, six species, type species *T. brunneosetosa* (Singer) E. Horak, stipitate-pileate, presumably ectomycorrhizal, tropical Africa, China?, see Zang 2001, Kirk et al. 2013 (genus accepted), sequence data available, see Vu et al. 2019 (DNA barcodes).

Tubulicium Oberw. 1965, Hydnodontaceae, Trechisporales, Agaricomycetes, asexual morph unknown, seven species, type species *T. vermiferum* (Bourdot) Oberw., wood-decaying, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2004 (phylogeny).

Tubulicrinis Donk 1956, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, 34 species, type species *T. glebulosus* (Fr.) Donk, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson et al. 2006 (phylogeny).

Tubulicrinopsis Hjortstam & Kotir. 2007, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, four species, type species *T. ellipsospora* Kotir., Hjortstam & M. Kulju, Europe, sequence data unavailable, see Kirk et al. 2008.

Tulasnella J. Schröt. 1888, Tulasnellaceae, Cantharellales, Agaricomycetes, asexul morph *Epulorhiza* R.T. Moore 1987, c. 70 species, type species *T. lilacina* J. Schröt., saprobes, ecological strategies highly diverse: saprobic, orchid mycorrhiza, ectomycorrhizal, parasitic on amoebae, associated with liverworts, wood-rotting, on other fungi, intrahymenial, endophytic in roots, widespread, see Kirk et al. 2013 (genus accepted), Oberwinkler et al. 2017 (distributional and ecological review), sequence data available, see Moncalvo et al. 2006 (phylogeny, cantharelloid clade), Veldre et al. 2013 (phylogeny, Ceratobasidiaceae, evolution), new spp. and species delimitation see Cruz et al. 2011, 2014 (tropical Andean forest, cryptic species), Almeida et al. 2014 (Brazil, as *Epulorhiza*), Linde et al. 2014, 2017 (species delineation, Australia), Cruz et al. 2016 (taxonomic revision), Solis et al. 2017 (Spain), Fujimori et al. 2019 (Japan).

Tulostoma Pers. 1794, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 83 species, type species *T. brumale* Pers., worldwide, dry environment, stalked puffballs, see de Diego Calonge and Esteban 2007 (Spain), Hanson 2008 (Sweden), Piña et al. 2010 (America), Chakraborty et al. 2013 (India), Kirk et al. 2013 (genus accepted), Trierveiler-Pereira et al. 2017 (*T. dumeticola*), sequence data available, see Larsson and Jeppson 2008 (phylogeny), new spp. see Hernández Caffot et al. 2011 (Argentina), Hussain et al. 2016 (Pakistan), Jeppson et al. 2017 (Europe), Hernández-Navarro et al. 2018 (Mexico).

Tumidapexus D.A. Crawford 1954, Aphelariaceae, Cantharellales, Agaricomycetes, asexual morph unknown, one species, type species *T. ravus* D.A. Crawford, saprobes, wood-decaying, found in New Zealand, genus in need of modern interpretation, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Turbinellus Earle 1909, Gomphaceae, Gomphales, Agaricomycetes, asexual morph unknown, five species, type species *T. floccosus* (Schwein.) Earle ex Giachini & Castellano, terrestrial, some species ectomycorrhizal, some species edible (*T. floccosus*), see Lamus et al. 2015 (central Mexico), sequence data available, see Giachini et al. 2010 (phylogeny), Giachini and Castellano 2011 (taxonomy).

Turmalinea Orihara & N. Maek. 2015, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, four species, type species *T. persicina* Orihara, sequestrate, ectomycorrhizal, Asia, sequence data available, see Orihara et al. 2016b (taxonomy).

Tygervalleyomyces Crous 2017, Typhulaceae, Agaricales, Agaricomycetes, sexual morph unknown, one species, type species *T. podocarpi* Crous, South Africa, sequence data available, see Crous et al. 2017b (taxonomy).

Tylocinum Y.C. Li & Zhu L. Yang 2016, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, one species, type species *T. griseolum* Yan C. Li & Zhu L. Yang, basidioma stipitate-pileate with tubular hymenophore, sequence data available, see Wu et al. 2016f (taxonomy, China).

Tylopilus P. Karst. 1881, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 100 species, type species *T. felleus* (Bull.) P. Karst., worldwide, some species edible (*T. alboater* (Schwein.) Murrill), see Kikuchi et al. 2009 (fruiting body formation), Dai et al. 2010b (edible mushrooms, China), Kirk et al. 2013 (genus accepted), sequence data available, see Gelardi et al. 2015c (phylogeny, China), new spp. see Osmundson and Halling 2010 (Costa Rica), Horak 2011 (revision), Sarwar et al. 2014 (Pakistan), Wu et al. 2016f (monograph, China), Magnago et al. 2017b (Brazil), Chakraborty et al. 2018 (Indian Himalaya), Liang et al. 2018 (China).

Tylospora Donk 1960, Atheliaceae, Atheliales, Agaricomycetes, asexual morph unknown, two species, type species *T. asterophora* (Bonord.) Donk, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Yamashiro et al. 2008 (phylogeny, Japan).

Tympanella E. Horak 1971, Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *T. galanthina* (Cooke & Massee) E. Horak, New Zealand, basidioma gasteroid, see Kirk et al. 2013 (genus accepted), sequence data available, see Horak 2018 (New Zealand).

Typhrasa Örstadius & E. Larss. 2015, Psathyrellaceae, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *T. gossypina* (Bull.) Örstadius & E. Larss., Europe, North America, on wood or on soil, sequence data available, see Örstadius et al. 2015 (taxonomy).

Typhula (Pers.) Fr. 1818, Typhulaceae, Agaricales, Agaricomycetes, some species asexual morph *Sclerotium* Tode 1790, c. 100 species, type species *T. phaccorrhiza* (Reichard) Fr., seven subgenera: *Typhula* Fr., *Pistillina* Quél., *Gliocoryne* Marie, *Pistillaria* Fr., *Typhulina* Berthier et Khurana, *Microtyphula* Berthier, and *Cnazonaria* Corda, saprobes or pathogens, terrestrial, worldwide of cold climate, some pathogenic species (snow molds), Typhula blight (*T. incarnata* Lach, *T. ishikariensis* S. Imai, *T. japonica* Terui, *T. phaccorrhiza* (Reichard) Fr., *T. trifolii* Rostr., *T. variabilis* Riess), see Hoshino et al. 2009a (ecophysiological characteristics), Kirk et al. 2013 (genus accepted), sequence data available, see Hoshino et al. 2009a, Gafforov and Hoshino 2015, Ikeda et al. 2016, new

spp. see Olariaga et al. 2008 (herbarium specimens), Olariaga and Salcedo 2009 (Spain), Hoshino et al. 2009b (seashore, Japan).

Tyromyces P. Karst. 1881, Incrustoporiaceae, Polyporales, Agaricomycetes, asexual morph unknown, c. 41 species, type species *T. chioneus* (Fr.) P. Karst., the generic limit of *Tyromyces* is not currently settled (needs revision since genus shown to be polyphyletic), poroid hymenophore, wood-rotting, white rot, cosmopolitan, see Kirk et al. 2013 (genus accepted), sequence data available, see Miettinen and Rajchenberg 2012 (phylogeny), new spp. see Mata and Ryvarden 2010 (morphology, Costa Rica), Ryvarden and Iturriaga 2011 (morphology, Venezuela), Ryvarden 2012a, d, 2016b, 2018a (morphology, Costa Rica, Colombia, Venezuela, Ethiopia, Kenya, Zimbabwe), Hyde et al. 2017b (phylogeny, Brazil), new combinations see Ryvarden 2012c, 2016a (morphology, type study, Brazil), Zmitrovich 2018a (taxonomy).

Udeniomyces Nakase & Takem. 1992, Mrakiaceae, Cystofilobasidiales, Tremellomycetes, sexual morph unknown, four species, type species *U. pyricola* (Stadelmann) Nakase & Takem., yeast, widespread, see Kurtzman et al. 2011 (taxonomy), cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny).

Udeniozyma Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, *incertae sedis*, *incertae sedis*, Microbotryomycetes, sexual morph unknown, one species, type species *U. ferulica* (J.P. Samp. & Uden) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, aquatic, Portugal, cultures and sequence data available, see Wang et al. 2015e (taxonomy, phylogeny).

Ugola Adans. 1763, *incertae sedis*, Agaricales, Agaricomycetes, sexual morph *Asterophora* Ditmar 1809, three species, type species *U. physaroides* (Fr.) Redhead & Seifert, sequence data unavailable, see Kirk et al. 2008.

Uleiella J. Schröt. 1894, Uleiellaceae, Uleiellales, Ustilaginomycetes, two species, type species *U. paradoxa* J. Schröt., plant parasites (young inflorescences) on *Araucaria* spp. (Araucariaceae), Brazil, Chile, see Kirk et al. 2013 (genus accepted), cultures available, sequence data available, see Riess et al. 2016 (taxonomy, phylogeny).

Uncobasidium Hjortstam & Ryvarden 1978, *incertae sedis*, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *U. luteolum* Hjortstam & Ryvarden, corticioid basidioma, wood-rotting, widespread (Europe, South America), sequence data unavailable, see Gorjón et al. 2012a (new sp., morphology, Patagonian Andes of Argentina), Kirk et al. 2013 (genus accepted).

Uncol Buriticá & P.A. Rodr. 2000, Uncolaceae, Pucciniales, Pucciniomycetes, one species, type species *U. diazii* Buriticá & P.A. Rodr., biotrophic on Pteridophyta (Cyatheaceae), terrestrial, Colombia, see Cummins and Hiratsuka 2003 (excluded from Pucciniales).

Ungulidaedalea B.K. Cui, M.L. Han & Y.C. Dai 2016, Fomitopsidaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *U. fragilis* (B.K. Cui & M.L. Han) B.K. Cui, M.L. Han & Y.C. Dai, poroid hymenophore, wood-rotting, brown rot, China, sequence data available, see Han et al. 2016a (taxonomy, phylogeny, *Fomitopsis s. l*), Zmitrovich 2018a (taxonomy).

Unilacryma Shirouzu, Tokum. & Oberw. 2013, Unilacrymaceae, Unilacrymales, Dacrymycetes, asexual morph unknown, one species, type species *U. unispora* (L.S. Olive) Shirouzu, Tokum. & Oberw., wood-decaying, Asia (Japan), sequence data available, see Shirouzu et al. 2013b (taxonomy, phylogeny).

Uraecium Arthur 1933, *incertae sedis*, Pucciniales, Pucciniomycetes, twelve species, type species *U. holwayi* (Arthur) Arthur, worldwide, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Uredinella Couch 1937, Septobasidiaceae, Septobasidiales, Pucciniomycetes, two species, type species *U. coccidiophaga*, worldwide, sequence data available, see Henk and Vilgalys 2007 (phylogeny), Kirk et al. 2013 (genus accepted).

Uredinopsis Magnus 1893, Pucciniastraceae, Pucciniales, Pucciniomycetes, 30 species, type species *U. filicina* (Niessl) Magnus, biotrophic on *Pteridophyta* (Osmundaceae, Polypodiaceae), Pinaceae, terrestrial, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see McTaggart et al. 2014 (first record of fern rust in Australia, phylogeny), Aime et al. 2018a (phylogeny, evolution with host, Pucciniales).

Uredo Pers. 1801 (= *Mapea* Pat. 1906, = *Nigredo* (Pers.) Roussel 1806, = *Peridipes* Buriticá & J.F. Hennen 1994, = *Rubigo* (Pers.) Roussel 1806, = *Trichobasis* Lév., in Orbigny 1849, = *Uredo* ** *Nigredo* Pers. 1801), *incertae sedis*, Pucciniales, Pucciniomycetes, asexual morph particularly of *Melampsora* Castagne 1843, *Puccinia* Per. 1974, *Uromyces* (Link) Unger 1833, ca. 600 species, type species *U. betae* Pers., biotrophic on many plant families, terrestrial, worldwide, see Kirk et al. 2013 (genus accepted), sequence data availale, see McTaggart et al. 2016b (phylogeny, Australia), Wang et al. 2015e (phylogeny), new spp. see Yepes and Céspedes 2008 (neotropics), Berndt 2009 (South Africa), Mohanan 2010 (Kerala), de Carvalho and Hennen 2010 (new combinations), Hernández and Cline 2010 (replaced *Uredo spinulosa* Y. Ono, nom. illeg. with *Uredo dioscoreae-doryphorae*), Zhuang and Wei 2011, 2012, 2016 (China), Berndt and Wood 2012 (South Africa).

Uredopeltis Henn. 1908, Phakopsoraceae, Pucciniales, Pucciniomycetes, seven species, type species *U. congensis* Henn., biotrophic on Burseraceae, Euphorbiaceae,

Rubiaceae, Tilliaceae, terrestrial, probably circumglobal in tropics, see Kirk et al. 2013 (genus accepted), new spp. see Mohanan 2010 (Kerala).

Urocystis Rabenh. ex Fuckel 1870, Urocystidaceae, Urocystidales, Ustilaginomycetes, 166 species, type species *U. occulta* (Wallr.) A.A. Fisch. Waldh., plant parasites (leaves, stems, sometimes in flowers, fruits, roots) on dicots and monocots, widespread, see Kirk et al. 2013 (genus accepted), cultures available, sequence data available, Begerow et al. 2014 (taxonomy), Wang et al. 2015c (taxonomy, phylogeny).

Uromyces (Link) Unger 1833, nom. cons., see Art. 14, Pucciniaceae, Pucciniales, Pucciniomycetes, (= *Alveomyces* Bubák 1914, = *Capitularia* Rabenh. 1851, = *Coeomurus* Gray 1821, = *Dichlamys* Syd. & P. Syd. 1920 [1919], = *Groveola* Syd. 1921, = *Haplopyxis* Syd. & P. Syd. 1920 [1919], = *Haplotelium* Syd. 1922, = *Hypodermium* subgen. *Uromyces* Link 1816 [1815], = *Klebahnia* Arthur 1906, = *Nielsenia* Syd. 1921, = *Ontotelium* Syd. 1921, = *Poliotelium* Syd. 1922, = *Puccinella* Fuckel 1860, = *Pucciniola* L. Marchand 1829, = *Teleutospora* Arthur & Bisby 1921, = *Telospora* Arthur 1906, = *Trochodium* Syd. & P. Syd. 1920 [1919], = *Uromycopsis* Arthur 1906), c. 1500 species, type species *U. appendiculatus* (Pers.) Link, see Kirk et al. 2013 (genus accepted), sequence data available, see Chung et al. 2008 (identification with PCR), Link et al. 2014 (genome sequence), Souza et al. 2015 (new combination, molecular analysis, key to *Uromyces* on Loranthaceae), new spp. see Chung et al. 2008 (China), McKenzie 2008 (new combinations, New Zealand), Salazar Yepes and Buriticá Céspedes 2008 (neotropics), Berndt and Baiswar 2009 (India), Thaung 2009 (Burma), Walker and van der Merwe 2009 (Australia), Zhuang and Wei 2011 (China), Berndt 2013a (key to species on Cucurbitaceae), Bahcecioglu 2014 (Turkey), Sánchez and Piepenbring 2014 (key to species on Loranthaceae), Souza et al. 2015 (Brazil).

Uromycladium McAlpine 1905 (= *Macalpinia* Arthur 1906), Pileolariaceae, Pucciniales, Pucciniomycetes, eleven species, type species *U. simplex* McAlpine, biotrophic on Fabaceae (*Acacia*, *Paraserianthes*), gall rust, terrestrial, Australia, South East Asia, South Pacific, New Zealand, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Berndt 2010b (Australia), Doungsaard et al. 2015 (molecular analysis, key to genus, South-East Asia).

Uropyxis J. Schröt. 1875 (= *Calliospora* Arthur 1905), Uropyxidaceae, Pucciniales, Pucciniomycetes, 15 species, type species *U. amorphae* (M.A. Curtis) J. Schröt., biotrophic on Bignoniaceae, Cucurbitaceae, Fabaceae, terrestrial, Africa, North, South and Central America, China, sequence data unavailable see Kirk et al. 2013 (genus accepted), Ordoñez and Barnes 2017 (morphology).

Ustacystis Zundel 1945, Urocystidaceae, Urocystidales, Ustilaginomycetes, two species, type species *U. waldsteiniae* (Peck) Zundel, parasitic on *Waldsteinia* (Rosaceae), see Vánky 2009 (*U. waldsteiniae*), sequence data available, see Begerow et al. 2006 (phylogeny).

Ustanciosporium Vánky 1999, Anthracoideaceae, Ustilaginales, Ustilaginomycetes, 22 species, type species *U. rhynchosporae* Vánky, plant parasite (spikelet) on Cyperaceae, widespread, cultures available, see Kirk et al. 2013 (genus accepted), sequence data available, see Piepenbring et al. 1999 (sequences data), Begerow et al. 2014 (taxonomy), Wang et al. 2015c (taxonomy, phylogeny).

Ustilago (Pers.) Roussel 1806, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, 170 species, type species *U. hordei* (Pers.) Lagerh., plant parasites (inflorescence, flowers, leaves) on Poaceae, widespread, saprobic yeast states on plants, see Kirk et al. 2013 (genus accepted), cultures available, sequence data available, see Begerow et al. 2000 (phylogeny), Vánky 2012 (overview), McTaggart et al. 2012a, 2016c (taxonomy).

Ustilentyloma Savile 1964, Ustilentylomataceae, Microbotryales, Microbotryomycetes, four species, type species *U. pleuropogonis* Savile, sequence data available, new combination see Wang et al. 2015e (phylogeny, taxonomy).

Vandasia Velen. 1922, *incertae sedis*, Phallales, Agaricomycetes, asexual morph unknown, one species, type species *V. rosea* Velen., terrestrial, sequence data unavailable, see Kirk et al. 2008.

Vanderbylia D.A. Reid 1973, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, seven species, type species *V. vicina* (Lloyd) D.A. Reid, poroid hymenophore, wood-rotting, white rot, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2013 (phylogeny), Zmitrovich 2018a (taxonomy).

Vankya Ershad 2000, Urocystidaceae, Urocystidales, Ustilaginomycetes, three species, type species *V. ornithogali* (J.C. Schmidt & Kunze) Ershad, plant parasites (leaves) on Liliaceae, North America, Asia, Europe, cultures unavailable, sequence data available, see Begerow et al. 2014 (taxonomy), Wang et al. 2015c (taxonomy, phylogeny).

Vanrija R.T. Moore.1980 (= *Asterotremella* H.J. Prillinger, K. Lopandic, K. Sterflinger, E. Metzger & R. Bauer; = *Asterotremella* Prillinger, Lopandic & Sugita), Trichosporonaceae, Trichosporonales, Tremellomycetes, sexual morph unknown, nine species, type species *V. humicola* (Dasz.) R.T. Moore, yeast, soils, on wood, worldwide, cultures and sequence data available, see Liu et al. 2015b (taxonomy, phylogeny), Takashima et al. 2018 (taxonomy, phylogeny), new spp. see Xi et al. 2019 (China).

Vanromburghia Holterm. 1898, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *V. silvestris* Holterm., Indonesia, litter decay, sequence data unavailable, see Kirk et al. 2008.

Vararia P. Karst. 1898, Peniophoraceae, Russulales, Agaricomycetes, asexual morph unknown, c. 50 species, type species *V. investiens* (Schwein.) P. Karst., worldwide, wood-decaying, see Karasinski 2010 (Polish resupinate Russulales, key), Kirk et al. 2013 (genus accepted), sequence data available, see Liu and He 2016b (phylogeny, China), new spp. see Samita et al. 2012 (India).

Veloporphyrellus L.D. Gómez & Singer 1984, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, seven species, type species *V. pantoleucus* L.D. Gómez & Singer, stipitate-pileate, North and Central America, southeastern Asia, Africa, see Kirk et al. 2013 (genus accepted), sequence data available, see Li et al. 2014g (phylogeny), Wu et al. 2016f (taxonomy, China).

Veluticeps (Cooke) Pat. 1894, Gloeophyllaceae, Gloeophyllales, Agaricomycetes, asexual morph unknown, twelve species, type species *V. berkeleyana* Cooke, wood-decaying, cause a brown rot of wood, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see He and Li 2013a (China), Yang et al. 2016a (China).

Verrucospora E. Horak 1967, *incertae sedis*, Agaricales, Agaricomycetes, asexual morph unknown, two species, type species *V. verrucispora* (Beeli) E. Horak, Africa, Thailand, see Kirk et al. 2013 (genus accepted), Sysouphanthong et al. 2013b (Thailand), sequence data available, see Matheny et al. 2006 (phylogeny).

Vesiculomyces E. Hagstr. 1977, Peniophoraceae, Russulales, Agaricomycetes, one species, type species *V. citrinus* (Pers.) E. Hagstr., resupinate, wood-rotting, sequence data available, see Larsson and Larsson 2003 (phylogeny), Miller et al. 2006 (phylogeny).

Violaceomyces Albu, Toome & Aime 2015, Violaceomycetaceae, Violaceomycetales, Ustilaginomycetes, one species, type species *V. palustris* S.A. Albu, M. Toome & M.C. Aime, known only from saprobic states, plant material, cultures available, sequence data available, see Albu et al. 2015 (taxonomy).

Vishniacozyma X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout 2015, Bulleribasidiaceae, Tremellales, Tremellomycetes, sexual and asexual morphs known, eleven species, type species *V. carnescens* (Verona & Luchetti) X.Z. Liu, F.Y. Bai, M. Groenew. & Boekhout, yeast, mycoparasite, yeast morphs on plant material, worldwide, cultures and sequence data available, see Liu et al. 2015b (taxonomy and phylogeny), Yurkov and Kurtzman 2019 (new spp.).

Volvariella Speg. 1898, Pluteaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 50 species, type species *V. argentina* Speg., worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Justo et al. 2011b (phylogeny, Pluteaceae), Vizzini et al. 2011c (phylogeny), Bao et al. 2013 (genome), new spp. see Menolli and Capelari 2008 (Brazil), Seok et al. 2009 (Korea), Justo and Castro 2010a, b (Iberian Peninsula), Senthilarasu et al. 2012 (India), Kaur et al. 2013c (India), Kaur and Singh 2014 (India), Xu et al. 2015b (China), Sá and Wartchow 2016 (Brazil).

Volvocisporium Begerow, R. Bauer & Oberw. 2001, Volvocisporiaceae, Violaceomycetales, Ustilaginomycetes, two species, type species *V. triumfetticola* (M.S. Patil) Begerow, R. Bauer & Oberw., plant parasites (leaves) on Malvacea, India, Namibia, cultures unavailable, sequence data available, see Begerow et al. 2001, 2014 (taxonomy, phylogeny), Wang et al. 2015c (taxonomy, phylogeny).

Volvopluteus Vizzini, Contu & Justo 2011, Pluteaceae, Agaricales, Agaricomycetes, asexual morph unkown, four species, type species *V. gloiocephalus* (DC.) Vizzini, Contu & Justo, Europe, North America, sequence data available, see Justo et al. 2011a (taxonomy, phylogeny).

Vonarxula Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, *incertae sedis*, *incertae sedis*, Microbotryomycetes, sexual morph unknown, one species, type species *V. javanica* (Arx & Weijman) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, plant material, Indonesia, cultures and sequence data available, see Wang et al. 2015e (taxonomy, phylogeny).

Vuilleminia Maire 1902, Vuilleminiaceae, Corticiales, Agaricomycetes, asexual morph unknown, eight species, type species *V. comedens* (Nees) Maire, wood-decaying, widespread, see Kirk et al. 2013 (genus accepted), sequence data available, see Ghobad-Nejhad et al. 2010 (phylogeny), new spp. see Ghobad-Nejhad and Ginns 2012 (North America to East Asia, Siberia, and Finland), Ghobad-Nejhad and Duhem 2014 (France).

Vustinia Kachalkin, Turchetti & Yurkov 2019, Mrakiaceae, Cystofilobasidiales, Tremellomycetes, sexual morph unknown, one species, type species *V. terrae* Kachalkin, Turchetti & Yurkov, yeast, psychrophilic, soil, Eruope, Asia, cultures and sequence data available, see Kachalkin et al. 2019 (description, phylogeny).

Waitea Warcup & P.H.B. Talbot 1962, Corticiaceae, Corticiales, Agaricomycetes, asexual morph as *Rhizoctonia zeae* Voorhees, one species, type species *W. circinata* Warcup & P.H.B. Talbot, saprotroph or plant parasitic, widespread, see Kirk et al. 2013 (genus accepted), Jayawardena et al. 2019 (full notes, phylogeny), sequence data available, Depriest et al. 2005 (phylogeny), Ghobad-Nejhad et al. 2010 (phylogeny).

Wakefieldia Corner & Hawker 1953, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, two species, type species *W. striaespora* Corner & Hawker,

sequestrate, Europe, Asia, see Kirk et al. 2013 (genus accepted), sequence data available, see Kaounas et al. 2011 (*W. macrospora*, Greece).

Wallemia Johan-Olsen 1887, Wallemiaceae, Wallemiales, Wallemiomycetes, eight speices, type species *W. ichthyophaga* Johan-Olsen, worldwide, food contamination agent, see Zajc and Gunde-Cimerman 2018 (contamination of food), sequence data available, new spp. see Jančič et al. 2015 (*W. sebi* species complex), Díaz-Valderrama et al. 2017 (South America).

Websdanea Vánky 1997, Websdaneaceae, Ustilaginales, Ustilaginomycetes, one species, type species *W. lyginiae* (Websdane, Sivasith., K.W. Dixon & Pate) Vánky, plant parasite on *Lyginia barbata* (Anarthriaceae), Australia, see Kirk et al. 2013 (genus accepted), cultures unavailable, sequence data available, see Begerow et al. 2014 (taxonomy), Wang et al. 2015c (phylogeny, taxonomy).

Wielandomyces Raithelh. 1988, Bolbitiaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *W. robustus* Raithelh., Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Woldmaria W.B. Cooke 1961, Niaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *W. filicina* (Peck) Knudsen, Europe, North America, see Kirk et al. 2013 (genus accepted), sequence data available, see Bodensteiner et al. 2004 (phylogeny).

Wolfiporia Ryvarden & Gilb. 1984, Laetiporaceae, Polyporales, Agaricomycetes, asexual morph *Pachyma* Fr. 1822, six species (needs revision since genus shown to be polyphyletic, see Hussein et al. 2018), type species *W. cocos* (F.A. Wolf) Ryvarden & Gilb., widespread, wood-rotting, sclerotium-forming (*W. cocos*), see Kirk et al. 2013 (genus accepted), Zmitrovich 2018a (taxonomy), sequence data available, see Lindner and Banik 2008 (phylogeny, North America), Floudas et al. 2012 (genome, *W. cocos*), some species edible or medicinal use, see Dai et al. 2009b (medicinal mushrooms, China), see Wang et al. 2013c (Mycology, cultivation, traditional uses, phytochemistry and pharmacology), new spp. see Tibpromma et al. 2017 (phylogeny, China).

Wrightoporia Pouzar 1966, Bondarzewiaceae, Russulales, Agaricomycetes, asexual morph unknown, 32 species, type species *W. lenta* (Overh. & J. Lowe) Pouzar, worldwide, wood-decaying, white rot, see Kirk et al. 2013 (genus accepted), sequence data available, see Chen et al. 2016b (molecular systematics), new sp. see Chen and Yu 2012 (South China), Jang et al. 2013a (South Korea), Chen and Cui 2014a (China).

Wrightoporiopsis Y.C. Dai, Jia J. Chen & B.K. Cui 2015, Hericiaceae, Russulales, Agaricomycetes, asexual morph unknown, five species, type species *W. neotropica* (Ryvarden) Y.C. Dai, Jia J. Chen & B.K. Cui, worldwide, wood-decaying, sequence data available, see Chen et al. 2016b (phylogeny).

Xanthagaricus (Heinem.) Little Flower, Hosag. & T.K. Abraham 1997, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, twelve species, type species *X. flavidorufus* (Berk. & Broome) Little Flower, Hosag. & T.K. Abraham, agaricoid, tropical, see Kirk et al. 2013 (genus accepted), sequence data available, new spp. see Hosen et al. 2017, 2018a (Asia), Hussain et al. 2018a (Pakistan), Kumla et al. 2018 (Thailand), Wang et al. 2018b (China).

Xanthoconium Singer 1944, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, ten species, type species *X. stramineum* (Murrill) Singer, stipitate-pileate, presumably ectomycorrhizal, North America, Asia, see Kirk et al. 2013 (genus accepted), some species edible, see Bessette et al. 2017 (Eastern North America), sequence data available, see Wu et al. 2016e (China), Liang et al. 2017b (China).

Xanthoporia Murrill 1916, Hymenochaetaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, three species, type species *X. andersonii* (Ellis & Everh.) Murrill, sequence data available, see Tura et al. 2011 (phylogeny).

Xanthoporus Audet 2010, Steccherinaceae, Polyporales, Agaricomycetes, asexual morph unknown, two species, type species *X. peckianus* (Cooke) Audet, stipitate basidioma, poroid hymenophore, terrestrial, widespread (Europe, North America), see Audet 2010 (taxonomy), sequence data available, see Audet 2010 (phylogeny).

Xenasma Donk 1957, Xenasmataceae, Russulales, Agaricomycetes, asexual morph unknown, 16 species, type species *X. rimicola* (P. Karst.) Donk, two subgenera, *Xenasma* and *Tubulixenasmopsis*, four sections, wood-decaying, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Binder et al. 2005 (phylogeny).

Xenasmatella Oberw. 1965, Xenasmataceae, Russulales, Agaricomycetes, asexual morph unknown, 14 species, type species *X. subflavidogrisea* (Litsch.) Oberw. ex Jülich, wood-decaying, Europe, see Kirk et al. 2013 (genus accepted), sequence data available, see Rosenthal et al. 2017 (ecology, corticioid fungi in North American pinaceous forests), new combination see Duhem et al. 2010.

Xenodochus Schltdl. 1826, Phragmidiaceae, Pucciniales, Pucciniomycetes, two species, type species *X. carbonarius* Schltdl., biotrophic on Rosaceae (*Sanguisorba*), terrestrial, circumboreal, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Xenolachne D.P. Rogers 1947, *incertae sedis*, Tremellales, Tremellomycetes, asexual morph unknown, two species, type species *X. flagellifera* D.P. Rogers, on wood, North

America, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Xenosperma Oberw. 1965, Xenasmataceae, Russulales, Agaricomycetes, asexual morph unknown, four species, type species *X. ludibundum* (D.P. Rogers & Liberta) Oberw., wood-decaying, Europe, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Xenostele Syd. & P. Syd. 1921, Pucciniaceae, Pucciniales, Pucciniomycetes, four species, type species *X. echinacea* (Berk.) Syd. & P. Syd., Asia, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Xeroceps Audet 2010, *incertae sedis*, Russulales, Agaricomycetes, asexual morph unknown, two species, type species *X. skamania* (Murrill) Audet, two species, worldwide, terrestrial, see Audet et al. 2010 (taxonomy), sequence data available, see Audet 2010.

Xerocomellus Šutara 2008, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, 17 species, type species *X. chrysenteron* (Bull.) Šutara, stipitate-pileate, ectomycorrhizal, worldwide, edible spp. see Boa 2004 (edible fungi), Šutara 2008 (genus accepted), new spp. see Crous et al. 2016a (Spain), Hernández-Restrepo et al. 2016 (Pakistan), Simonini et al. 2016 (Italy), Wu et al. 2016f (China).

Xerocomus Quél. 1887, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, c. 120 species, type species *X. subtomentosus* (L.) Quél., stipitate-pileate, ectomycorrhizal, worldwide, edible spp. see Boa 2004 (edible fungi), new spp. South America see De Meijer 2008, Husbands et al. 2013; Asia see Yan et al. 2013, Das et al. 2016, Wu et al. 2016f, Chakraborty et al. 2017a; Australia see Halling et al. 2015, new combinations see Horak 2011, many species in need of revision.

Xerocoprinus Maire 1907, Agaricaceae, Agaricales, Agaricomycetes, asexual morph unknown, one species, type species *X. arenarius* (Pat.) Maire, Africa, sequence data unavailable, see Kirk et al. 2013 (genus accepted), genus in need of revision.

Xeromphalina Kühner & Maire 1934, Mycenaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 32 species, type species *X. campanella* (Batsch) Kühner & Maire, worldwide, see Antonín and Noordeloos 2004 (Europe), Noordeloos 2012b (key), Kirk et al. 2013 (genus accepted), sequence data available, see Dogan and Karadelev 2009 (Europe), Aldrovandi et al. 2015 (*X. campanella/kauffmanii* complex), new spp. see Esteve-Raventós et al. 2010 (Mediterranean).

Xerotus Fr. 1828, *incertae sedis*, *incertae sedis*, Agaricomycetes, asexual morph unknown, four species, type species *X. afer* Fr., wood-rotting, Africa, sequence data available, see Vu et al. 2019 (sequence data).

Xerula Maire 1933, Physalacriaceae, Agaricales, Agaricomycetes, asexual morph unknown, c. 17 species, type species *X. pudens* (Pers.) Singer, worldwide, see Kirk et al. 2013 (genus accepted), sequence data available, see Petersen 2008a, b (taxonomy, basidiospores, Australia, New Zealand), Wang et al. 2008a (systematic study), Liu et al. 2009 (Thailand), Petersen and Hughes 2010 (monograph).

Xylobolus P. Karst. 1881, Stereaceae, Russulales, Agaricomycetes, asexual morph unknown, nine species, type species *X. frustulatus* (Pers.) P. Karst., worldwide, wood-decaying, see Kirk et al. 2013 (genus accepted), sequence data available, see Larsson and Larsson 2003 (phylogeny).

Xylodon (Pers.) Gray 1821, Schizoporaceae, Hymenochaetales, Agaricomycetes, asexual morph unknown, c. 60 species, type species *X. quercinus* (Pers.) Gray, see Kirk et al. 2013 (genus accepted), sequence data available, see Riebesehl and Langer 2017 (*Hyphodontia s. l.*, new combinations, keys, phylogeny).

Xylophallus (Schltdl.) E. Fisch. 1933, Phallaceae, Phallales, Agaricomycetes, asexual morph unknown, two species, type species *X. xylogenus* (Mont.) E. Fisch., terrestrial, Neotropics, wood-decaying, sequence data available, see Crous et al. 2018b (phylogeny, morphology).

Yamadamyces Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, Kriegeriaceae, Kriegeriales, Microbotryomycetes, sexual morph unknown, one species, type species *Y. rosulatus* (Golubev & Scorzetti) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, psychrophilic, plant material, Europe, cultures and sequence data available, see Wang et al. 2015e (taxonomy and phylogeny).

Yelsemia J. Walker 2001, Melanotaeniaceae, Ustilaginales, Ustilaginomycetes, four species, type species *Y. arthropodii* J. Walker, plant parasites (various plant parts) on Anthericaceae, Byblidaceae, Campanulaceae, Droseraceae, North America, Southeast Asia, Australasia, cultures unavailable, sequence data unavailable, see Begerow et al. 2014 (taxonomy).

Ypsilospora Cummins 1941, Raveneliaceae, Pucciniales, Pucciniomycetes, asexual morph *Uraecium* Arthur 1933, *Uredo* Pers. 1801, three species, type species *Y. baphiae* Cummins, biotrophic on Fabaceae, terrestrial, Africa (Ghana, Ivory Coast, Nigeria, Sierra Leone), Central and South America (Argentina, Brazil, Costa Rica, El Salvador, Guatemala), sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Yuchengia B.K. Cui & K.T. Steffen 2013, Polyporaceae, Polyporales, Agaricomycetes, asexual morph unknown, one species, type species *Y. narymica* (Pilát) B.K. Cui, C.L. Zhao & K.T. Steffen, poroid hymenophore, wood-rotting, white rot, widespread (Asia, Europe, North America), sequence data available, see Zhao et al. 2013b (taxonomy, phylogeny).

Yunchangia L. Guo & B. Xu 2013, Ustilaginaceae, Ustilaginales, Ustilaginomycetes, one species, type species *Y.*

puccinelliae L. Guo & B. Xu, plant parasite (leaves) on *Puccinellia* spp. (Poaceae), China, cultures unavailable, sequence data available, see Guo and Xu 2013 (taxonomy).
Yunzhangia Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout 2015, *incertae sedis*, *incertae sedis*, Microbotryomycetes, sexual morph unknown, two species, type species *Y. auriculariae* (Nakase) Q.M. Wang, F.Y. Bai, M. Groenew. & Boekhout, yeast, worldwide, cultures and sequence data available, see Wang et al. 2015e, Kachalkin et al. 2019 (taxonomy, phylogeny).
Yurkovia Mašínová, A. Pontes, J.P. Samp. & Baldrian 2016, *incertae sedis*, *incertae sedis*, Microbotryomycetes, sexual morph unknown, one species, type species *Y. mendeliana* Mašínová, A. Pontes, J.P. Samp. & Baldrian, yeast, temperate forest soil, Eruope, cultures and sequence data available, see Mašínová et al. 2017 (taxonomy), Kachalkin et al. 2019 (new spp.).
Zaghouania Pat. 1901 (= *Cystospora* E.J. Butler), Pucciniaceae, Pucciniales, Pucciniomycetes, two species, type species *Z. phillyreae* Pat., biotrophic on Oleaceae, terrestrial, Tunisia, India, sequence data unavailable, see Kirk et al. 2013 (genus accepted).
Zangia Y.C. Li & Zhu L. Yang 2011, Boletaceae, Boletales, Agaricomycetes, asexual morph unknown, six species, type species *Z. roseola* (W.F. Chiu) Y.C. Li & Zhu L. Yang, stipitate-pileate, southern China, sequence data available, see Li et al. 2011b (taxonomy).
Zhuliangomyces Redhead 2019, Amanitaceae, Agaricales, Agaricomycetes, asexual morph unknown, five species, type species *Z. olivaceus* (Zhu L. Yang, Y.Y. Cui & Q. Cai) Redhead, worldwide, sequence data available, see Cui et al. 2018 (taxonomy, phylogeny, Amanitaceae, China), Redhead 2019 (taxonomy).
Zundeliomyces Vánky 1987, Microbotryaceae, Microbotryales, Microbotryomycetes, one species, type species *Z. polygoni* Vánky, sequence data unavailable, see Kirk et al. 2013 (genus accepted).
Zygogloea P. Roberts 1994, *incertae sedis*, *incertae sedis*, Pucciniomycotina, asexual morph unknown, one species, type species *Z. gemellipara* P. Roberts, British Isles, Belgium, Netherlands, sequence data unavailable, see Kirk et al. 2013 (genus accepted).

Discussion

Notes and outline of the Basidiomycota

It is a significant challenge to keep track of names, name changes and synonyms across the whole Basidiomycota. Our work provides an overview of valid, currently used genera of Basidiomycota published so far in a single document. This work would greatly promote the establishment of a robust Basidiomycota taxonomic system by latter updates.

The outline includes 1928 genera with 1263 synonyms. For the 1928 accepted genera, we provided a short note for each genus including information on several sources such as distribution, life mode, important species and sequence data. Sequence data is one of the key aspects in our notes which was supported by citing the most recently (published after 2008) molecular studies or the important past molecular studies (published before 2008). We found that 599 genera in Basidiomycota to lack sequence data in public sequence repositories, which means nearly one third of the genera in Basidiomycota are not included in the molecular systematic study.

According to the latest version of Ainsworth & Bisby's Dictionary of the Fungi (Kirk et al. 2008), there were three subphyla, 16 classes, 52 orders, 177 families, 1589 genera and 31,515 species in Basidiomycota. In this study, the outline updates these numbers to four subphyla, 18 classes, 68 orders, 241 families, 1928 genera and 41,270 species in Basidiomycota. Agaricomycotina (30,788 species) embrace most of the species in Basidiomycota and include three classes, 29 orders, 150 families and 1514 genera. *Russula, Cortinarius* and *Entoloma* are the top three genera in species diversity in Agaricomycotina, and they were estimated to have 3000, 2250 and 1800 species, respectively. Although the high species diversity of Agaricomycotina has largely been discovered in recent years, systematic studies still need to be carried out for very many groups. For example, in Agaricales, nearly one quarter (129/508) of the genera remained with an uncertain familial placement ('*incertae sedis*') whereas in Auriculariales, more than half (26/41) of the genera remain *incertae sedis*. In Russulales, a total of 17 new genera were introduced after 2008, although six are *incertae sedis*. Furthermore, 44 genera are *incertae sedis* in Agaricomycetes. Pucciniomycotina was estimated to comprise 8653 species including 10 classes, 22 orders, 49 families and 270 genera. Pucciniomycetes with 8168 species is the largest group in Pucciniomycotina. Compared with the other three subphyla, Pucciniomycotina has a high diversity especially with respect to higher-level taxa which embraces more than half the classes in Basidiomycota (10 out of 18). The top three genera in species diversity are *Puccinia*, *Uromyces* and *Aecidium* with the estimated species numbers of 3300, 1500 and 800 respectively. Ustilaginomycotina is estimated to have 1805 species which includes four classes, 15 orders, 42 families and 128 genera. Ustilaginomycetes with 1185 species is the largest group in Ustilaginomycotina. Malasseziomycetes and Moniliellomycetes, the only two new classes recognized in the Basidiomycota since 2008, include an estimated 32 species. The top three genera in terms of species numbers

are *Sporisorium, Tilletia* and *Ustilago* with 195, 179 and 170 species, respectively. Wallemiomycotina is a recently recognized subphylum (Zhao et al. 2017c) with 12 species estimated in a single class, two orders and two families.

The phylogeny and divergence times within Agaricomycotina

The phylogenetic relationships between classes in this study (Fig. 1) agree with Hibbett (2006) and Zhao et al. (2017c). The subphylum Agaricomycotina originated at 406 Mya, three classes diverged between 298 to 341 Mya and 25 orders originated between 108 to 259 Mya; these data generally agree with those given by Zhao et al. (2017c—406 Mya for Aagricomycotina, 358–393 Mya for classes and 124–350 Mya for orders). Orders in Agaricomycetes diverged between 108–259 Mya which a relatively older time range when compared to Varga et al. (2019) having divergence times of 71–181 Mya. Hysterangiales and Phallales has more recent divergence times at 108 Mya in this study, while their divergence times were estimated 133 Mya and 159 Mya respectively in Zhao et al. (2017c).

There are 45 monophyletic families, dated with divergence times in a range of 27–178 Mya (Table 1). Noteworthly, in the Agaricales, two familes Hymenogastraceae and Tubariaceae having divergence time of 27 Mya and 54 Mya which are much younger than the other families (70–125 Mya).

The phylogeny and divergence times within Pucciniomycotina

Phylogenetic relationships at class level within subphylum Pucciniomycotina were in general agreement with the seven-gene phylogeny in Wang et al. (2015e) except that two more classes (Atractiellomycetes and Classiculomycetes) were included in this study, and there were different phylogenetic positions for Spiculogloeomycetes, Cystobasidiomycetes and Mixiomycetes between this study and Wang et al. (2015e). Tritirachiomycetes was located in a basal position without statistic support in Pucciniomycotina in Zhao et al. (2017c), while in this study, it was found sister to Agaricostilbomycetes with 0.9 PP support.

The subphylum Pucciniomycotina originated 406 Mya, and the classes originated between 211–383 Mya which generally agrees with Zhao et al. (2017c—406 for Pucciniomycotina and 245–356 Mya for classes). Orders originated between 128 to 244 Mya which also agrees with Zhao et al. (2017c—120–290 Mya). However, the divergence time of Pucciniales (275 Mya) is older than estimated by Zhao et al. (2017c—162 Mya), but it is closer to Aime et al. (2018a—215 Mya). In this study, we dated 16 families from four orders that originated between 42 to 222 Mya (Table 1). The youngest families are Ustilentylomataceae and Microbotryaceae, which originated 42 Mya, while the other families in Pucciniomycotina originated between 71 to 222 Mya. The justification for the separation of Ustilentylomataceae and Microbotryaceae needs further study. Thus, the families in Pucciniomycotina originated 85–222 Mya, and most of the families originated 91–196 Mya.

Some genera in Pucciniomycotina were retained as *incertae sedis*, and the divergence times may provide a clue to resolve those taxonomic problems. For example, *Jianyunia* was sister to Chionosphaeraceae in Agaricostilbales and with the divergence time of 162 Mya, which was similar to the divergence time of most families in this subphylum. Thus, our study suggests that *Jianyunia* is likely to represent a monotypic family, which is similar to the conclusions of Wang et al. (2015e). Similar situations are *Hasegawazyma*, which might be placed in Erythrobasidiaceae (in Erythrobasidiales) with divergence time of 102 Mya; the genera *Cyphobasidium* and *Cyrenella* (in Erythrobasidiales) should be classified in a new family which has the divergence time of 102 Mya; *Sampaiozyma* and *Curvibasidium* (in the Microbotryales) should be included in Leucosporidiaceae with the divergence time of 91 Mya; *Gymnosporangium* (from the Pucciniales), which the telial stage only occurrs on gymnosperms, is in a distinct phylogenetic position with a divergence time of 129 Mya, which might indicate that it should be raised to family level. However, the genera *Melampsora, Hyalopsora* and *Pucciniastrum*, which were included in the families Melampsoraceae and Pucciniastraceae, in this study, the results indicated they might belong to Coleosporiaceae with a divergence time of 133 Mya.

The phylogeny and divergence times within Ustilaginomycotina and Wallemiomycotina

The phylogenetic topology at the class level of Ustilaginomycotina and Wallemiomycotina in this study was almost the same as previous studies (Wang et al. 2015c; Zhao et al. 2017c), especially the relationship within the orders of Ustilaginomycetes which agreed with the four-gene phylogeny of Begerow et al. (2006), the seven-gene phylogeny of Wang et al. (2015c) and the five-gene phylogeny of Riess et al. (2016). The exception is Ceraceosorales, which was at the base of Ustilaginomycetes in this study, but it was in Exobasidiomycetes in the other studies (Wang et al. 2015c; Riess et al. 2016). As in the previous studies (Begerow et al. 2006; Wang et al. 2015c; Zhao et al. 2017c), the class Exobasidiomycetes was polypheletic in this study, but orders Microstromatales,

Tilletiales, Golubeviales, Robbauerales, Georgefischeriales, Doassansiales and Exobasidiales were resolved as monophyletic with high statistical support within Exobasidiomycetes. For Malasseziomycetes and Moniliellomycetes, only one taxon from each class was used in this study. In this study, they were in a weakly-supported sister group relationship. However, their sister group relationship was well-supported in the previous studies (Wang et al. 2014a; Zhao et al. 2017c), or they were not in a sister group relationship (Wang et al. 2015c; Riess et al. 2016). Better taxon sampling and more sequence data are needed in the future studies to verify the phylogenetic position of these two classes in Ustilaginomycotina and to infer their divergence times. At the ordinal level, all the orders were monophyletic with high supports. The family Entylomataceae was not supported in this study, unlike in Wang et al. 2015c.

The subphylum Ustilaginomycotina originated 430 Mya. Ustilaginomycetes orginated at 248 Mya in this study, which generally agrees with data from Zhao et al. (2017c—Ustilaginomycetes originated at 265 Mya) and Kijpornyongpan et al. (2018—Ustilaginomycetes originated at 239 Mya). Orders in Ustilaginomycotina originated between 172–319 Mya with the exception of Doassansiales and Georgefischeriales, which were not dated due to their uncertain phylogenetic position. Doassansiales is sister to Georgefischeriales with a divergence time of 187 Mya in Zhao et al. (2017c), in contrast their sister group relationship was not supported in other studies (Begerow et al. 2006; Wang et al. 2015c; Riess et al. 2016). Exobasidiales was the oldest order of Exobasidiomycetes in this study and Zhao et al. (2017c). With three more families (Brachybasidiaceae, Graphiolaceae and Cryptobasidiaceae) included in this study, Exobasidiales has an older divergence time (319 Mya) than given by Zhao et al. (2017c—265 Mya).

Except for the families in monotypic orders (such as Golubeviaceae and Robbaueraceae), 18 families are well dated in this study, and these families originated between 61–211 Mya. The youngest families are Urocystidaceae and Floromycetaceae which originated at 61 Mya; and Cryptobasidiaceae is the oldest family in Ustilaginomycotina with a divergence time of 211 Mya. Thus, the presently range of divergence times at order and family levels are still large: 172–319 Mya and 79–177 Mya, respectively.

Divergence time and taxa ranking in Basidiomycota

Recognition of taxonomic groups has, to date, mainly been based on phenotype and phylogenetic reconstruction with different ranks being applied in a subjective manner (e.g. Ariyawansa et al. 2014; Phookamsak et al. 2014). Recently, the divergence time was used as an additional criterion and successfully applied in fungal systematics from genus to kingdom level (Zhao et al. 2016f, 2017c; Liu et al. 2017c; Hongsanan et al. 2017; Tedersoo et al. 2018). Thus, the divergence time estimates of certain groups would be useful in the reconstruction of a modern taxonomic systems, especially in complex groups. For Basidiomycota, the divergence time range of most higher taxa (order and above) have been assessed, and these were 406–490 Mya for subphyla, 245–393 Mya for classes and 120–290 Mya for orders (Zhao et al. 2017c). In this study we used a larger dataset, and the results showed that the divergence time range of subphyla were 406–430 Mya, classes were 211–383 Mya and orders were 99–323 Mya, which generally agreed to the previous study (Zhao et al. 2017c).

Furthermore, in this study we investigated the divergence time of families within Basidiomycota. The results indicated that families of Agaricomycotina diverged during 27–178 Mya, Pucciniomycotina diverged during 85–222 Mya and those from Ustilaginomycotina 79–177 Mya. Compared with the divergence time of most families, the Cryptobasidiaceae should be raised to that of order due to its older divergence time compared to most current families. While the families Urocystidaceae, Floromycetaceae, Ustilentylomataceae, Microbotryaceae and Leucosporidiaceae could be combined with other families as they have a quite younger divergence time.

As we had indicated before, this study will provide new clues to resolve the taxonomic problems in the present taxonomic system of Basidiomycota, but the final decision on any groups or problems requires more in-depth studies, which need to add more related samples to get a better phylogenetic topology, including phenotypic examination and other related studies. The divergence times would furthermore provide important information towards a better understanding of the phylogeny and the evolution events of the Basidiomycota.

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