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The 2018 classification and checklist of lichenicolous fungi, with 2000 non-lichenized, obligately lichenicolous taxa

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ABSTRACT. Lichenicolous fungi represent a highly specialized and successful group of organisms that live exclusively on lichens, most commonly as host-specific parasites, but also as broad-spectrum pathogens, saprotrophs or commensals. We present here the most recent update to the classification of lichenicolous fungi in the Ascomycota and Basidiomycota to genus level, arranged phylogenetically according to published classifications. For each genus, all known lichenicolous taxa (obligately lichenicolous taxa, lichenicolous lichens, and facultatively lichenicolous taxa) are listed, along with information about types, synonyms, pertinent literature and whether or not molecular data are available for any of the listed species. The number of accepted lichenicolous fungi is now 2319, with 2000 obligately lichenicolous species, subspecies or varieties, 257 lichenicolous lichens and 62 facultatively lichenicolous taxa. These species are found in 10 different classes of Fungi (Ascomycota and Basidiomycota), 55 orders, 115 families and 397 genera. The 2319 total taxa is an increase from the 1559 total species reported in the last published catalogue in 2003, and a larger number than the approximately 1800 reported in the most recent online checklist (www.lichenicolous.net) posted in January 2018. Of the total number of taxa, 2219 (96%) are ascomycetes and 100 (4%) are basidiomycetes. Of the 397 genera containing lichenicolous species, c. 50% (198) are entirely lichenicolous. In addition, six families (Abrothallaceae, Adelococcaceae, Cyphobasidiaceae, Obryzaceae, Polycoccaceae, Sarcopyreniaceae) and two orders (Abrothallales, Cyphobasidiales) are entirely lichenicolous. Sequence information is available for lichenicolous species in 128 (32%) of the 397 genera containing lichenicolous species, and in 56 (28%) of the 198 entirely lichenicolous genera. Many species are known from only one host lichen, but it is likely that broader host ecologies will be discovered as new sequence information is obtained from ongoing microbiome studies. *Phaeopyxis* Rambold & Triebel is considered as a new synonym of *Bachmanniomyces* D.Hawksw., resulting in five new combinations *B. australis* (Rambold & Triebel) Diederich & Pino-Bodas (\equiv *P. australis*), *B. carniolicus* (Arnold) Diederich & Pino-Bodas (\equiv *Biatora carniolica*), *B. muscigenae* (Alstrup & E.S.Hansen) Diederich & Pino-Bodas (\equiv *P. muscigenae*), *B. punctum* (A.Massal.) Diederich & Pino-Bodas (\equiv *Nesolechia punctum*) and *B. varius* (Coppins, Rambold & Triebel) Diederich & Pino-Bodas (\equiv *P. varia*). As a consequence of a phylogenetic analysis including new sequences, *Dactylospora* Körb. is regarded as a new synonym of *Sclerococcum* Fr. : Fr., resulting in one new name (*S. acarosporicola* Ertz & Diederich) and 46 new combinations. Sclerococcaceae Réblová, Unter. & W.Gams is considered as a new synonym of Dactylosporaceae Bellem. & Hafellner. The new *Sclerococcum ophthalmizae* Coppins is described. *Sclerophyton occidentale* Herre is lectotypified on the lichenicolous fungus present in the type specimen and becomes a younger synonym of *Sclerococcum parasiticum*. A replacement name is *Arthonia polydactylonis* Diederich & Ertz (\equiv *A. ceracea*). Further new combinations are *Abrothallus lobariae* (Diederich & Etayo) Diederich & Ertz (\equiv *Phoma lobariae*), *A. psoromatis* (Zhurb. & U. Braun) Diederich & Zhurb. (\equiv *P. psoromatis*), *Asteroglobulus pyramidalis* (Etayo) Diederich (\equiv *Cornutispora pyramidalis*), *Didymocortis grumantiana* (Zhurb. & Diederich) Zhurb. & Diederich (\equiv *Phoma grumantiana*),

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Epithamnolia atrolazulina (Etayo) Diederich (≡ *Hainesia atrolazulina*), *Gyalolechia epiplacynthium* (Etayo) Diederich (≡ *Fulgensia epiplacynthium*), *Nesolechia doerfeltii* (Alstrup & P.Scholz) Diederich (≡ *Phacopsis doerfeltii*), *N. falcispora* (Triebel & Rambold) Diederich (≡ *P. falcispora*), *N. oxyspora* var. *fusca* (Triebel & Rambold) Diederich (≡ *P. oxyspora* var. *fusca*), *Preussia peltigerae* (Brackel) Diederich (≡ *Sporormiella peltigerae*), *Scutula curvispora* (D.Hawksw. & Miądl.) Diederich (≡ *Libertiella curvispora*), *S. didymospora* (D.Hawksw. & Miądl.) Diederich (≡ *L. didymospora*), *Stigmatidium haesitans* (Nyl.) Diederich (≡ *Verrucaria haesitans*), and *S. parvum* (Henssen) Diederich (≡ *Pharcidia parvum*).

KEYWORDS. Endolichenic fungi, lichenicolous lichens, microbiome, mycoparasites, phylogeny.



Lichenicolous fungi represent a highly specialized and successful group of organisms that live exclusively on lichens, most commonly as host-specific parasites, but also as broad-spectrum pathogens, saprotrophs and commensals. Although they have been collected and described for centuries, little is known about the basic biology of most species, including modes of cellular contact, nutrient exchange, antibiosis, or virulence. Most are assumed to be restricted to a single host genus, but the degree of host-specificity is usually not known because of uncertainties about species boundaries and distributions. Very few lichenicolous fungi have been brought into culture, and little is known about their cultural requirements.

Lichenicolous fungi are assumed to represent an important source of new species in many groups of fungi (Hawksworth & Rossman 1997), but their overall diversity remains uncharted territory. This classification provides a snapshot of the phylogenetic diversity of lichenicolous fungi based on information updated continuously in the online website www.lichenicolous.net. It is being published here in the classification series in *The Bryologist* to provide a permanent baseline survey to which future classifications can be compared as new information accumulates.

LICHENICOLOUS FUNGI

Lichen parasites. All lichenicolous fungi are technically lichen parasites (they acquire fixed carbon from living lichen thalli), but many have no noticeable effects on the lichen host and some have the same nutrition as lichens. Most of the currently recognized lichenicolous species are weak parasites of either the lichen mycobiont (mycoparasites) or photobiont (phycoparasites) or sometimes both, recognizable by the presence of galls, lesions

and discolorations on the lichen thallus. Some species are broad-spectrum pathogens that cause extensive damage capable of killing the host, but this is very rare among lichenicolous species (Hawksworth 1982c). Contacts between the parasite and the lichen host have been observed microscopically (Grube & Hafellner 1990; Grube & de los Ríos 2001; de los Ríos & Grube 2000; Diederich 1996), but the actual nature of most associations is not known with certainty.

Lichenicolous lichens. In addition to lichen myco- and phycoparasites, some described lichenicolous fungi are known to be derived from lichens and have the same nutrition (Rambold & Triebel 1992). They are therefore lichen fungi in search of a photobiont, facultative lichens usually referred to in the literature, and in this classification, as “lichenicolous lichens.” They commonly begin growth as a free-living lichen mycobiont that becomes lichenized by associating with the photobiont of an unrelated lichenized thallus. Over time, the parasitic mycobiont becomes independent, either continuing to use the original host’s photobiont or obtaining another photobiont later. Other lichenicolous lichens have their own photobiont but are typically collected on the surfaces of other “host” lichens. In this case, they are not biologically parasites (they are nutritionally lichens), but routinely associate with other lichens, growing over the surface of the host and clearly affecting its health and fitness. In this classification, we include all of these fungi in a separate category (lichenicolous lichens) and mention in the species listing following each genus what hosts they are known to associate with.

Host specificity. In this classification, obligate parasites and pathogens will be the predominant category to which species are assigned, and the main known hosts will be listed. A few species are

commonly collected from lichens but are also known to be capable of living on non-lichen substrates of various sorts. These will be referred to in this classification as “facultatively lichenicolous” species. The host ecology of most species is assumed to be remarkably narrow for parasitic organisms. Most described species, perhaps as many as 95% (Lawrey & Diederich 2003), associate with a single lichen species or genus and are never found elsewhere. Similarly, some lichens harbor far more described lichenicolous fungi than others (Table 2 in Lawrey & Diederich 2003), indicating that suitability as hosts varies among lichen species probably for a wide variety of reasons (discussed by Hawksworth 1982d; Lawrey & Diederich 2003).

The close association of lichen parasites and lichen hosts would argue for a potential coevolutionary relationship among the associates. Until recently, lichen-parasite interactions have not been studied with regard to coevolution despite the fact that high levels of host-specificity are assumed to indicate cospeciation resulting from coevolution (Page 2003). In a very interesting first look at this, Millanes et al. (2014b) found that parasitism can be an important driver of speciation in lichen parasites and may help to explain the high numbers of both species and levels of host specificity in certain groups of lichenicolous fungi. The parasite studied was *Biatoropsis usnearum*, a basidiomycete known to infect a variety of *Usnea* lichens. The morphological variability in *B. usnearum* had been noted before and suggested to the authors that more than one parasite species might actually be involved in these interactions. The authors found that this was indeed the case—*Biatoropsis usnearum* is made up of seven lineages, some of which are more host specific than others. This diversity apparently arose by host switching, especially in the most host-specific lineages. This interesting first look at possible lichen-parasite coevolution suggests that host specificity and diversity in lichen parasites may therefore be a by-product of a number of ecological interactions that have rarely been studied in detail in these organisms.

Although lichenicolous fungi have been collected for centuries, our understanding of their actual distributions in nature, including the levels of host specificity and host ranges, will likely change over time as more information becomes available. This new information will include not only new collections, but also data from lichen microbiome studies

(discussed in the next section) that indicate the presence of these fungi in asymptomatic lichens. For example, Fernandez-Mendoza et al. (2017) discovered using 454 pyrosequencing approaches that sequences of lichenicolous fungi are found not only in lichens with symptoms, but also in the same lichen species without symptoms, and (most surprisingly) in other lichen species never known to harbor the parasites. It may therefore eventually be discovered that the apparent high levels of host specificity in these fungi are not as high as they appear now. However, far more high-throughput sequencing of lichens is needed to establish this with certainty.

Effects of lichenicolous fungi on lichen health and fitness. Very little is known about the effects lichen parasites have on lichen hosts, but it is assumed that in many cases the association is more or less commensalistic with little or no effects on the lichens. In other cases, there is obvious discoloration or thallus damage, sometimes extensive, but the extent to which this affects lichen growth and reproduction is still largely unknown. The broad-spectrum pathogen *Athelia arachnoidea* is known to cause damage in European lichen communities, especially those affected by air pollution (e.g., Arvidsson 1976, 1978), but it does not appear to alter lichen community composition (Hawksworth 1982c). Few studies have measured the direct effect of parasites on lichen fitness, but a recent study (Merinero & Gauslaa 2017) showed experimentally that the gall-forming parasites *Plectocarpon lichenum* and *P. scrobiculatae* reduced the growth and fitness of the *Lobaria* lichens on which they grow. Effects on lichens may also involve degradation of lichen compounds, something lichenicolous fungi are known to do (Lawrey 2000). This can result in exposure of lichens to damaging UV radiation (Edwards et al. 2017) or to increased competition and predation (Asplund et al. 2016, 2018), ultimately leading to reduced growth and fitness.

Lichenicolous fungi as members of lichen mycobiomes. Lichens have long been known to harbor a diverse but largely invisible mycobiota in addition to the lichen-forming mycobiont (see e.g., Girlanda et al. 1997; Petrini et al. 1990; Suryanarayanan et al. 2005; Li et al. 2007; Harutyunyan et al. 2008; Fleischhacker et al. 2015; Muggia et al. 2016; Muggia & Grube 2010; Spribille et al. 2016; Fernandez-Mendoza et al. 2017; Wang et al. 2016;

Zhang et al. 2015). Until recently, these fungi were assumed to be mainly opportunistic and facultative plant- and soil-inhabiting saprotrophs. Some are undoubtedly described lichenicolous forms that have not developed recognizable structures, but there are indications that additional groups of obligately lichen-associated fungi may occur in lichens. Detection techniques were originally culture-based, but recent uses of molecular methods have expanded our knowledge of the diversity, composition and specificity of these fungi, and it is now apparent that many are not generalized randomly-distributed contaminants but members of recognizable, more-or-less obligate, lichen-associated communities. Hofstetter et al. (2007) were first to suggest that nonlichen fungal sequences commonly amplified from lichens may represent a previously unrecognized source of lichen-specific fungal diversity. These were later referred to as “endolichenic” forms by Arnold et al. (2009), who viewed them as phylogenetically distinct from both lichen-forming mycobionts and lichenicolous fungi and an important evolutionary link to plant-associated endophytes (e.g., Chagnon et al. 2016; Fleischhacker et al. 2015; Muggia et al. 2016; U’Ren et al. 2010, 2012, 2014).

Arnold et al. (2009) originally considered endolichenic and lichenicolous fungi to be distinguishable by: (1) presence of symptoms—lichenicolous fungi show outward symptoms of infection and endolichenics lack any obvious outward symptoms; (2) phylogeny—endolichenic fungi were found to be most common among primarily non-lichenized lineages of euascomycetes (Sordariomycetes, Dothideomycetes, Leotiomycetes and Pezizomycetes) but absent among the lichen-dominated clades (Lecanoromycetes, Arthoniomycetes, Lichinomycetes), while lichenicolous fungi were thought to be closely related to lichens and found mainly in lichen-forming clades. As for the first difference (symptoms), it is now evident that lichens with and without obvious symptoms of infection harbor numerous described lichenicolous species in their mycobiomes (Fernandez-Mendoza et al. 2017). Since very few described lichenicolous species have been sequenced until very recently, the ability to identify endolichenics as lichenicolous species is limited at present. However, as more sequences of described species are published, it will be possible to identify those previously assigned to endolichenic fungi that actually belong to described lichenicolous

species. As for the second difference (phylogeny), Lawrey & Diederich (2003) showed earlier, and many studies done since (incorporated into this classification), continue to support the idea that lichenicolous fungi are well-represented in both lichen-forming and non-lichenized clades of fungi. Since phylogenetic placement helps to elucidate origins of these fungi, it is apparent that lichenicolous fungi have multiple origins from lichen-forming and non-lichenized ancestors while endolichenic fungi are most likely descended from non-lichenized ancestors (Arnold et al. 2009). Given what we know about these lichen-associated groups now, we would argue that they represent components of the same communities and the distinction between them is likely to become less clear-cut as more lichen mycobiomes are studied and the inhabitants identified.

DIVERSITY AND CLASSIFICATION HISTORY

Lichenicolous fungi have been studied and described since the mid-18th century, long before the symbiotic nature of lichens was recognized (Acharius 1795, 1810; Dillenius 1742). Illustrated and remarkably thorough treatments appeared in the 19th and early 20th centuries (Keissler 1930; Lindsay 1869; Olivier 1905–1907; Vouaux 1912–1914; Zopf 1896), drawing the attention of both lichenologists and other mycologists to these fungi. Modern compilations were produced by Clauzade & Roux (1976 – with 457 species) and Clauzade et al. (1989 – with 686 species) (**Fig. 1**). Hawksworth (1983) published keys to 218 lichenicolous species known from the British Isles and Ihlen & Wedin (2008) keys to 298 species known from Sweden. The most recent published compilation (Lawrey & Diederich 2003) listed 1559 total species worldwide and the most recent online worldwide checklist includes around 1800 described species, including in some cases infraspecific taxa (Lawrey & Diederich 2003; <http://www.lichenicolous.net>). However, taking into account Hawksworth’s (1991b, 2001) global estimates of fungal diversity and average levels of host specificity, and the total number of 19,409 lichen species in the most current classification (Lücking et al. 2016, 2017), the actual number of lichenicolous fungal species should be much higher. Estimates are that 3000–5000 species will eventually be described. In the present cata-

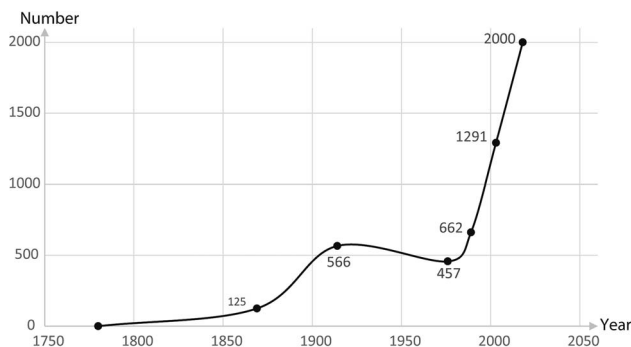


Figure 1. Number of obligate non-lichenized lichenicolous taxa (species, subspecies or varieties) accepted by Lindsay (1869), Vouaux (1912–14), Clauzade & Roux (1976), Clauzade et al. (1989), Lawrey & Diederich (2003) and the present classification (2018).

logue, we list a total of 2319 lichenicolous species or infraspecific taxa.

MATERIALS AND METHODS

We produced a hierarchical listing of genera based on the most recent data available in www.lichenicolous.net [posted January 3, 2018]. For all genera, the latest phylogenetic and taxonomic papers have been consulted, and the resulting classification compared with other recent classifications of fungi (e.g., Jaklitsch et al. 2016, Lücking et al. 2016, Lumbsch & Huhndorf 2007; Wijayawardene et al. 2017, Zhao et al. 2017) to detect errors or omissions.

As is the case for the online checklist, we list for each genus all lichenicolous species or infraspecific taxa (obligately lichenicolous taxa, lichenicolous lichens and facultatively lichenicolous taxa), along with information about types, synonyms, numbers of each category of lichenicolous species or infraspecific taxa, pertinent literature and whether or not molecular data are available.

Molecular techniques and phylogenetic analyses. For the phylogenetic tree of the Sclerococcales (Fig. 4), a total of five nuLSU rDNA and four mtSSU sequences were newly amplified and sequenced for three specimens of *Dactylospora lobariella* and two specimens of *D. parasitica*, using the techniques described in Ertz et al. (2018a,b). Members of Sclerococcales for which the nuLSU and/or the mtSSU sequences were available were selected from Diederich et al. (2013), Muggia et al. (2016, 2017), Réblová et al. (2017) and Pino-Bodas et al. (2017), and their sequences

retrieved from GenBank (Table 6). *Penicillium javanicum*, *Pyrgillus javanicus* and *Sphinctrina turbinata* were chosen as outgroup. The sequences were aligned using MAFFT v6.814b (Kato et al. 2002) on the CIPRES Web Portal (Miller et al. 2010) and improved manually using Mesquite 3.04 (Maddison & Maddison 2015). Terminal ends of sequences and ambiguously aligned regions were delimited manually and excluded from the datasets.

Best-fit evolutionary models were estimated using Akaike Information Criterion (AIC; Akaike 1973) as implemented in jModelTest2 2.1.6 (Darriba et al. 2012). The TIM1+H+G and the GTR+G models were selected respectively for the nuLSU and the mtSSU datasets. The combined nuLSU+mtSSU dataset consisted of 29 specimens and 1610 unambiguously aligned sites. A bayesian analysis was carried out on the nuLSU+mtSSU dataset using the Metropolis-coupled Markov chain Monte Carlo (MCMCMC) method in MrBayes v. 3.2.6 (Ronquist & Huelsenbeck 2003) on the CIPRES Web Portal (Miller et al. 2010). Two parallel MCMCMC runs were performed, each using four independent chains and 40 million generations, sampling trees every 1000th generation. Posterior probabilities (PP) were determined by calculating a majority-rule consensus tree generated from 60002 post-burnin trees of the 80002 trees sampled by the two MCMCMC runs using the sumt option of MrBayes. PP \geq 0.95 were considered to be significant. The phylogenetic tree was visualized using FigTree v. 1.4.2 (Rambaut 2012). The dataset and tree were deposited in Treebase as submission 23081.

RESULTS AND DISCUSSION

At the time of this publication, the total number of lichenicolous fungi, including in certain cases subspecific taxa (Table 1, Supplementary Table S1) is 2319, with 2000 obligately lichenicolous species, 257 lichenicolous lichens and 62 facultatively lichenicolous species. This is a significant increase from the 1559 total species reported in the last published checklist (Lawrey & Diederich 2003), and a larger number even than the approximately 1800 reported in the most recent online checklist posted in January earlier this year. Of the total number of species, 2219 (96%) are ascomycetes (Fig. 2) and 100 (4%) are

Table 1. Current total numbers of lichenicolous fungi (obligate lichenicolous, lichenicolous lichens and facultative lichenicolous) represented in various taxonomic ranks.

Taxonomic rank	Category	Numbers
Species	obligate lichenicolous	2000
	lichenicolous lichens	257
	facultative lichenicolous	62
	Total	2319
Genera	obligate lichenicolous	341
	lichenicolous lichens	63
	facultative lichenicolous	34
	Total	397
Families	obligate lichenicolous	98
	lichenicolous lichens	28
	facultative lichenicolous	21
	Total	115
Orders	obligate lichenicolous	45
	lichenicolous lichens	16
	facultative lichenicolous	17
	Total	55
Classes	obligate lichenicolous	8
	lichenicolous lichens	4
	facultative lichenicolous	6
	Total	10
		Number of species
Basidiomycota	obligate lichenicolous	93
	lichenicolous lichens	0
	facultative lichenicolous	7
	Total	100
Ascomycota	obligate lichenicolous	1907
	lichenicolous lichens	257
	facultative lichenicolous	55
	Total	2219

basidiomycetes (**Fig. 3**), and this ratio did not change from 2003.

Of the 397 genera in the list, 198 (c. 50%) are entirely lichenicolous (**Table 2**); there are also six families and two orders, some with large numbers of species, that are entirely lichenicolous (**Table 3**).

Table 2. Number of genera containing varying levels of lichenicolous species.

Level of representation	Ratio of	
	lichenicolous species to all species in the genus	Number of genera
All lichenicolous species	100%	198
	≥ 80%	210
Some lichenicolous species	≥ 50%	227
	≥ 20%	270
At least one lichenicolous species	> 0%	397

Table 3. Families and orders of fungi containing only lichenicolous species.

Taxonomic category	Number of species
Families with only lichenicolous species	
Abrothallaceae	57
Polycoccaceae	72
Adelococcaceae	14
Sarcopyreniaceae	11
Obryzaceae	3
Cyphobasidiaceae	2
Orders with only lichenicolous species	
Abrothallales	57
Cyphobasidiales	2

Table 4. Genera with the largest number of described lichenicolous fungi (all three categories, obligate, facultative and lichenicolous fungi). For genera indicated in bold, all known species are lichenicolous.

Genus	Order	Number of described species
Arthonia	Arthoniales (Asco)	140
Stigmidium	Verrucariales (Asco)	94
Opegrapha	Arthoniales (Asco)	72
Sclerococcum	Sclerococcales (Asco)	64
Polycoccum	Trypetheliales (Asco)	60
Tremella	Tremellales (Basidio)	60
Lichenochora	Phyllachorales (Asco)	44
Endococcus	Verrucariales (Asco)	44
Pronectria	Hypocreales (Asco)	44
Abrothallus	Abrothallales (Asco)	42
Cercidospora	Dothideomycetes inc. sed. (Asco)	40
Plectocarpon	Arthoniales (Asco)	40
Lichenopeltella	Dothideomycetes inc. sed. (Asco)	39
Rhizocarpon	Rhizocarpales (Asco)	39
Sphaerellothecium	Dothideomycetes inc. sed. (Asco)	35
Zwackhiomyces	Collemopsidiales (Asco)	35
Chaenothecopsis	Mycocaliciales (Asco)	33
Skyttea	Helotiales (Asco)	30
Taeniolella	Asterotexiales (Asco)	30

Table 5. Genera of lichenicolous fungi with published sequences. In some cases the type species of the genus has been sequenced, but the lichenicolous members of the genus have not been sequenced.

Category	Numbers
Number of genera with lichenicolous sequences	128
Number of genera with type sequenced	171
Number of genera with type and lichenicolous sequenced	102

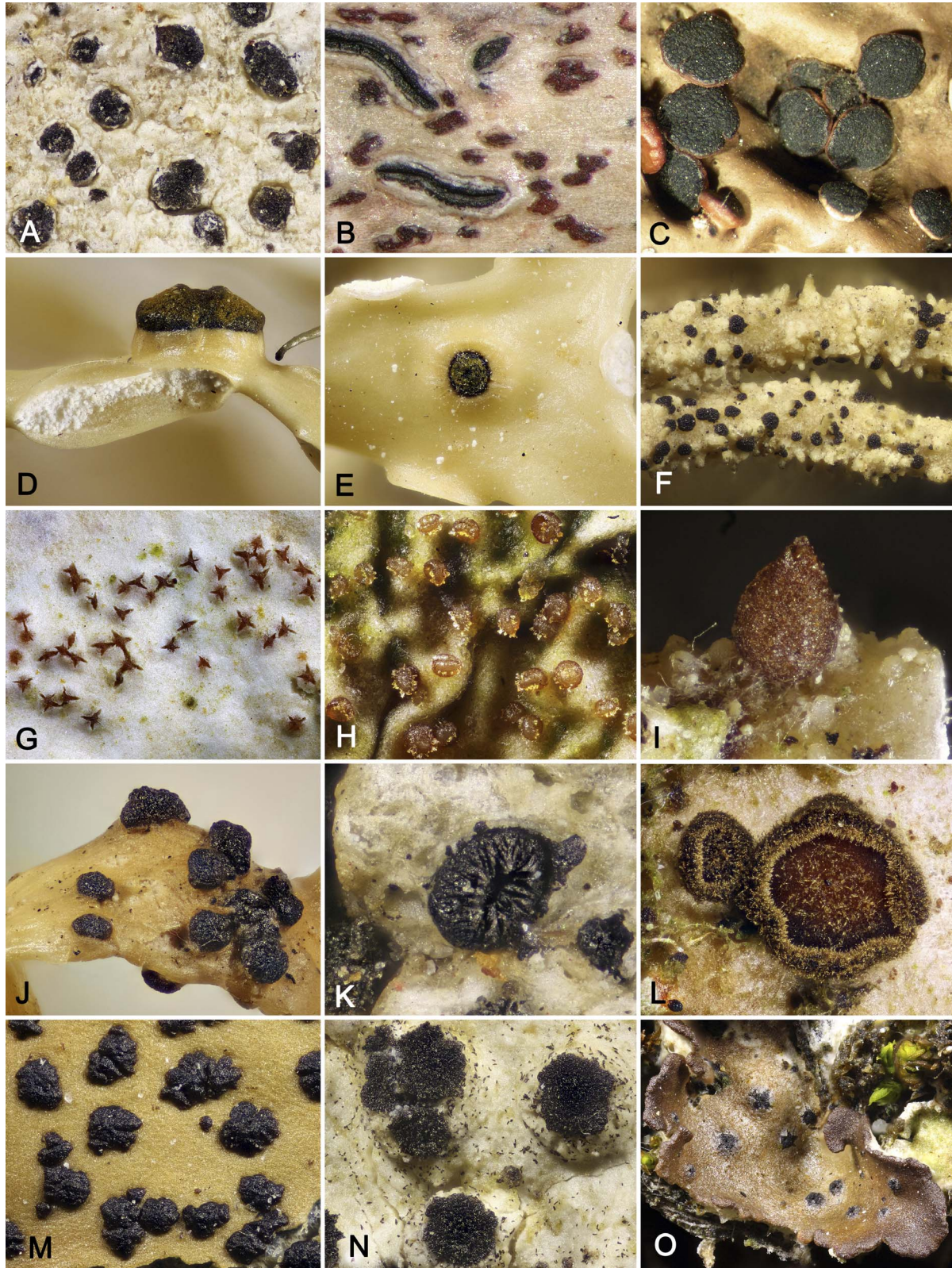


Figure 2. Morphological diversity of lichenicolous ascomycetes. **A.** *Arthonia diorygma* on Graphidaceae (Arthoniales, Arthoniaceae). **B.** *A. graphidicola* on *Graphis* (id.). **C.** *Plectocarpon lichenum* on *Lobaria* (id., Lecanographaceae). **D.** *Mixtoconidium insidiens* (sexual stage) on *Ramalina* (id., gen. inc. sed.). **E.** id. (pycnidial stage). **F.** *Lichenostigma maureri* on *Usnea* (Lichenostigmatales, Phaeococcomycetaceae). **G.** *Pronectria robergei* on *Peltigera* (Hypocreales, Bionectriaceae). **H.** *Trichonectria rubefaciens* on *Pleurosticta* (id.). **I.** *Lichenobarya usneae* on *Usnea* (id., Hypocreaceae). **J.** *Llimoniella ramalinae* on *Ramalina* (Helotiales, Corderitidaceae). **K.** *Skyttea pertusariicola* on *Pertusaria* (id.). **L.** *Unguiculariopsis manriquei* on *Lobaria* (id.). **M.** *Hemigrapha asteriscus* on *Peltigera* (Asterotexiales, gen. inc. sed.). **N.** *Nigromacula uniseptata* on *Hypotrachyna* (gen. inc. sed.). **O.** *Neolamya peltigerae* on *Peltigera* (id.). All photographs by Paul Diederich.



Figure 3. Morphological diversity of lichenicolous basidiomycetes. **A.** *Chionosphaera lichenicola* on *Fellhanera* (Agaricostilbales, Chionosphaeraceae). **B.** *Cyphobasidium hypogymniicola* on *Hypogymnia* (Cyphobasidiales, Cyphobasidiaceae). **C.** *C. usneicola* on *Usnea* (id.). **D.** *Heterocephalacria physciacearum* on *Physcia* (Filobasidiales, Filobasidiaceae). **E.** *Biatoropsis minuta* on *Usnea* (Tremellales, Tremellaceae). **F.** *Tremella caloplacae* s.l. on *Xanthoria* (id.). **G.** *Arrhenia peltigerina* on *Peltigera* (Agaricales, Hygrophoraceae). **H.** *Athelia arachnoidea* (sexual stage) on *Xanthoria* (Atheliales, Atheliaceae). **I.** id. (sclerotial stage). **J.** *Leucogyrophana lichenicola* on *Cladonia* (Boletales, Coniophoraceae). **K.** *Erythrimum aurantiacum* on *Physcia* (Corticiales, Corticiaceae). **L.** *Marchandiomyces corallinus* on *Xanthoparmelia* (id.). **M.** *Burgellopsis nivea* on a sterile crustose lichen (Cantharellales, gen. inc. sed.). **N.** *Burgella lutea* on *Sticta* (id.). **O.** *Minimedusa pubescens* on *Scoliciosporum chlorococcum* (id.). All photographs by Paul Diederich.

Many genera that are entirely lichenicolous contain only one species, but some contain over 30 species (Table 4). Sequence information is available for lichenicolous species in 128 (32%) of the 397 genera containing lichenicolous species, in 56 (28%) of the 198 entirely lichenicolous genera (Table 5), and the generic type has been sequenced in 171 genera (some of which include lichenicolous species that have not yet been sequenced). Many species have also been brought into culture (listed in www.lichenicolous.net).

THE 2018 CLASSIFICATION AND CHECKLIST OF LICHENICOLOUS FUNGI IN THE ASCOMYCOTA AND BASIDIOMYCOTA

In the following compilation, the 391 fungal genera containing lichenicolous species in all three categories (obligately lichenicolous, lichenicolous lichens, facultatively or doubtfully lichenicolous) are listed hierarchically by subfamily (where applicable), family, order, subclass (where applicable), class, subphylum and phylum. Following the style of the lichen classification (Lücking et al. 2016 [2017]), all categories are listed in strict alphabetical order. For each genus entry, the following information is given: type, synonyms (only when the type species is lichenicolous), data on the existence of sequences [e.g., in “Mol.: yes (T, L)”, “yes” means that sequences exist, “T” that the generic type has been sequenced and “L” that at least one lichenicolous species has been sequenced], nomenclatural or taxonomic notes, and number of taxa in each category [e.g., “23-1-2 (80)” means that 23 species, subspecies or varieties are obligately lichenicolous (non-lichenized), 1 taxon is a lichenicolous lichen, 2 taxa are facultatively (or doubtfully) lichenicolous, while the genus includes a total of c. 80 species (estimation based on recent literature and online databases); the latter number is omitted when all species are lichenicolous]. Species isolated from lichens in culture are included and are treated as doubtfully lichenicolous. Endolichenic species have sometimes been cultured but often are known only from DNA sequences. When they have not been named, they are excluded from the classification. Species names are given in bold regular font when **obligately lichenicolous**, in bold italic font for *lichenicolous lichens*, and in bold regular font underlined when facultatively (or doubtfully) lichenicolous. An alphabetical listing

of all species follows, along with the most common known lichen hosts. In some instances, poorly known species are included within the genus where they most likely belong, without formally combining them there. References cited after each genus mainly refer to taxonomic treatments. In author citations of genera and species, “ex” citations are omitted.

Phylum ASCOMYCOTA Caval.-Sm.

Subphylum PEZIZOMYCOTINA O.E.Erikss. & Winka

Class ARTHONIOMYCETES O.E.Erikss. & Winka

Order **Arthoniales** D.Hawksw. & O.E.Erikss.

Family **Arthoniaceae** Rchb.

Arthonia Ach. s.l.; type: *A. radiata* (Pers.) Ach. (lichenized) [= *Asterotrema* Müll.Arg.; type: *A. parasiticum*; = *Celidiopsis* A.Massal.; type: *C. gyrolophii*; = *Celidium* Tul.; type: *C. fuscopurpureum*; = *Charcotia* Hue; type: *C. rufidula*; = *Conida* A.Massal.; type: *C. clemens*; = *Conida* subgen. *Conidella* Elenkin; type: *C. urceolata*; = *Helicobolomyces* Matzer; type: *H. lichenicola* (asexual), i.e. *A. cinnabarinula*; = *Spilodinium* A.Massal.; type: *S. fuscopurpureum*; = *Subhysteropycnis* Wedin & Hafellner; type: *S. maculiformans* (asexual), i.e. *A. maculiformis*]. Mol.: yes (T, L). Currently polyphyletic.

Species: 139-1-0 (500). **abrothallina** Nyl.: on *Pseudocyphellaria*; **agelastica** R.C.Harris & Lendemer: on *Lecanora louisiana*; **albotrachynae** Etayo: on *Hypotrachyna endochlora*; **almquistii** Vain.: on *Amygdalaria*, *Koerberiella*, *Porpidia* and *Trapelia*; **amandineicola** van den Boom & Ertz: on *Amandinea efflorescens*; **amylospora** Almq.: on *Porpidia* and *Farnoldia*; **anatolica** Halıcı & Candan: on *Aspicilia contorta*; **anjutae** S.Y.Kondr. & Alstrup [as ‘anjuti’]: on *Teloschistes*; **apotheciorum** (A.Massal.) Almq. [=? *A. galactinaria* Leight.; =? *A. subvarians* Nyl.]: on *Myriolecis*; **arthoniicola** Diederich & Aptroot: on *Arthonia catenulata*; **aspiciliae** Alstrup & E.S.Hansen: on *Aspicilia*; **atropunctata** Vain.: on sterile foliicolous cf. *Echinoplaca*; **ayseniae** Halıcı & Candan [as ‘aysenae’]: on *Acarospora*; **Celidium bacidiosporum** Steiner: on *Parmotrema andinum* [a poorly known species possibly belonging to *Arthonia* s.l.]; **badia** Wedin & Hafellner: on *Pseudocyphellaria granulata*; **biatoricola** Ihlen & Owe-Larss.: on *Biatora efflorescens*; **brussei** Egea & Torrente [= *A. capensis* Egea & Torrente, nom. illeg., non *A. capensis* Stizenb.]: on *Lecanographa*; **caeruleascens** (Almq.) R.Sant.: on *Lecanora varia*; **calicii** Kantvilas & Wedin [as ‘caliciae’]: on *Calicium tricolor*; **catillarioides** Etayo: on *Sticta*; **cinnabarinula** Müll.Arg. [= *Helicobolomyces lichenicola* Matzer]: on foliicolous *Porina* and *Trichothelium*; **circinata** Th.Fr.: on *Umbilicaria*; **clemens** (Tul.) Th.Fr. [= *Conida clemens* (Tul.) A.Massal.]: on *Rhizoplaca*; **cohabitans** Coppins: on *Arthothelium reagens*; **colombiana** Etayo: on *Cladonia*; **coniocraeae** Brackel: on *Cladonia coniocraea*; **coriifoliae**

Wedin & Hafellner: on *Pseudocyphellaria coriifolia*; **coronata** Etayo: on *Flavoparmelia caperata*; **cryptotheciae** Matzer & R.Sant.: on foliicolous *Myriostigma candida*; **darbishirei** Follmann & Werner: on *Rocella nigerrima*; **destruens** Rabenh. var. **destruens**: on *Physcia*; **destruens** var. **nana** Grube & Hafellner: on *Xanthomendoza fallax*; **digitatae** Hafellner: on *Cladonia* [often co-occurring with *Milospium lacoizquetae*]; **digitispora** Etayo [as 'digitospora']: on *Sticta*; **diorygmae** S.Joshi, D.K.Upreti & S.Nayaka: on *Diorygma*; **diploiciae** Calat. & Diederich: on *Diploicia canescens*; **epicladonia** (Nyl.) Alstrup & Zhurb. [= *Scutula epicladonia* (Nyl.) Sacc.]: on *Cladonia*; **epifarinosae** Etayo: on *Pannaria*; **epimela** (Almq.) I.M.Lamb: on *Amandinea punctata*; **epiphyscia** Nyl.: on *Physcia*; **epitoninia** Halıcı & Candan: on *Toninia*; **excentrica** Th.Fr.: on *Lepraria*; **farinacea** (H.Olivier) R.Sant.: on *Ramalina*, especially *R. farinacea*; **flavicantis** Wedin & Hafellner: on *Pseudocyphellaria flavicans*; **follmaniana** Diederich: on *Rocella*; **fuscopurpurea** (Tul.) R.Sant. [= *Celidium fuscopurpureum* Tul.; = *Spilodium fuscopurpureum* (Tul.) A.Massal.]: on *Peltigera*; **garajonayi** Etayo: on *Porina*; **gelidae** R.Sant.: on *Placopsis gelida*; **glacialis** Alstrup & E.S.Hansen: on *Rhizoplaca melanophthalma*; **glaucomaria** (Nyl.) Nyl.: on *Lecanora rupicola*; **graphidicola** Coppins: on *Graphis scripta*; **griseopruinosa** F.Berger & E.Zimm.: on *Pertusaria pseudocorallina*; **Celidiopsis gyrolophii** A.Massal.: on *Cora* [a poorly known species pertaining to *Arthonia* s.l.]; **haematommatum** Kalb & Hafellner: on *Haematomma*; **haematostigma** Grube & Hafellner: on *Ramalina*; **hawksworthii** Halıcı: on *Dimelaena*; **hertelii** (Calat., Barreno & V.J.Rico) Hafellner & V.John: on *Aspicilia*; **heterodermiae** Etayo: on *Heterodermia*; **hodgesii** Lendemer & R.C.Harris: on *Graphis lineola*; **infectans** Egea & Torrente: lichen, juvenile lichenicolous on *Lecanographa hypothallina* and *Sparria cerebriforme*; **ingaderiae** Follmann: on *Ingaderia*; **insularis** Kantvilas & Wedin: on *Sirenophila eos*; **intermedia** Matzer: on foliicolous *Porina*; **intexta** Almq.: on *Lecidella*; **invadens** Coppins: on *Schismatomma quercicola*; **japewiae** Grube & Holien: on *Japewia*; **lecaniicola** van den Boom & M.Haji Moniri: on *Lecania triseptata*; **lecanoricola** Alstrup & Olech [as 'lecanoriicola']: on *Lecanora populicola*; **lecanorina** (Almq.) R.Sant.: on *Lecanora albella*; **lepidiota** (H.Olivier) R.Sant.: on *Fuscopannaria praetermissa*; **Abrothallus lepidophilus** Anzi: on *Cladonia* [a poorly known species possibly belonging to *Arthonia* s.l.]; **lethariicola** Alstrup & M.S.Cole: on *Letharia*; **leucomelodis** F.Berger & E.Zimm.: on *Leucodermia leucomelos*; **lobariellae** Etayo: on *Lobariella*; **lobothalliae** Etayo: on *Lobothallia alphoplaca*; **maculiformis** Wedin & Hafellner [= *Subhysteropycnis maculiformans* Wedin & Hafellner]: on *Pseudocyphellaria glabra* and *P. homoeophylla*; **marginalis** Etayo: on *Pseudocyphellaria*; **mazosiicola** Matzer & R.Sant. [= *A. mazosiae* R. Sant., nom. inval., nom. illeg., non *A. mazosia* (A.Massal.) Willey]: on foliicolous *Mazosia*; **microsticta** Vain.: on foliicolous cf. *Fellhanera bouteillei* [a species of doubtful application]; **minuta** Wedin & Hafellner: on *Pseudocyphellaria coriifolia*; **molendoi** (Frauenf.) R.Sant.: on *Calogaya* and *Rusavskia*; **navasiana** Etayo: on *Lepraria*; **neglectula** Nyl.: on a sterile, sorediate crust (*Lepraria neglecta?*); **nephromiaria** Nyl.: on *Nephroma*; **nideri** (J.Steiner) Clauzade, Diederich & Cl.Roux, comb. inval.: on *Pyrenodesmia*; **obscurior** Triebel: on *Pilophorus dovrensis*; **oligo-spora** Vězda: on *Myriolecis crenulata*; **pannariae** Zhurb. & Grube: on *Protopannaria pezizoides* and *Psoroma hypnorum*; **pantherina** Etayo: on *Pertusaria pustulata*; **Asterotrema**

parasiticum Müll.Arg.: on *Athallia pyracea* [probably belongs to *Arthonia*, fide Aptroot 1991; incorrectly cited as *Arthonia parasitica* (Müll.Arg.) Aptroot by Sundin et al. 2012 and Frisch et al. 2014b]; **parietinaria** Hafellner & A.Fleischhacker: on *Xanthoria parietina*; **parmeliae** (C.W.Dodge & G.E.Baker) D.Hawksw. & Iturr.: on *Physcia caesia*; **peltigerea** Th.Fr.: on *Peltigera* and *Solorina*; **peltigerina** (Almq.) H.Olivier: on *Peltigera* and *Solorina*; **pelvetii** (Hepp) H.Olivier: on *Crocodia aurata*; **pepei** Etayo & Pérez-Ortega: on *Parmelina*; **phaeophysciae** Grube & Matzer: on *Phaeophyscia*; **physcidiicola** Frisch & G. Thor: on *Physcidia wrightii*; **plectocarpoides** (S.Y.Kondr. & D.J.Galloway) Wedin & S.Y.Kondr.: on *Pseudocyphellaria scabrosa*; **polia** Etayo & R.Sant.: on *Diploicia canescens*; **polydactylonis** Diederich & Ertz, nom. nov. [= *A. ceracea* Etayo & Breuss nom. illeg.]: on *Peltigera polydactylon* [a younger homonym of *Arthonia ceracea* Fée]; **pragensis** Horáková: on *Caloplaca teicholyta*; **prominens** Follmann: on *Pentagenella gracillima*; **protoparmeliae** Etayo: on *Protoparmelia badia*; **protoparmeliopseos** Etayo & Diederich: on *Protoparmeliopsis muralis*; **pseudocyphellariae** Wedin: on *Pseudocyphellaria multifida*; **pseudopegraphina** Matzer: on foliicolous *Mazosia*; **punctella** Nyl.: on *Diplotomma*; **rangiformicola** Brackel & Etayo: on *Cladonia rangiformis*; **rimeliicola** Diederich: on *Parmotrema*; **rinodinicola** Candan & Halıcı: on *Rinodina oleae*; **rubescens** (Arnold) Clauzade, Diederich & Cl.Roux: on *Buellia epipolia*; **rufidula** (Hue) D.Hawksw., R.Sant. & Øvstedal [= *Charcotia rufidula* Hue]: on *Umbilicaria*; **sagenidii** Vězda & Kantvilas: on *Lecanactis mollis*; **sampaianae** (Diederich & Etayo) Ertz & Diederich [= *Plectocarpus sampaianae* Diederich & Etayo]: on *Nevesia sampaiana*; **santessoniana** Wedin & Hafellner: on *Pseudocyphellaria scabrosa*; **santessonii** Matzer: on foliicolous *Porina*; **semiimmersa** Wedin & Hafellner: on *Pseudocyphellaria*; **sherpam** Grube & Matzer: on *Lecanora sherparum*; **squamarinae** Etayo: on *Squamarina*; **stereocaulina** (Ohlert) R.Sant.: on *Stereocaulon*; **stevensoniana** R.C.Harris & Lendemer: on *Haematomma accolens*; **stictaria** Nyl.: on *Pseudocyphellaria*; **stipitata** M.M.E.Alves, Aptroot & M.Cáceres: on unidentified sterile, sorediate, corticolous lichen (?*Bacidina*, *Fellhanera*); **subaggregata** Wedin & Hafellner: on *Pseudocyphellaria hirsuta*; **subconveniens** Nyl. [= *A. ricasoliae* Müll.Arg.]: on *Lobaria*; **subfuscicola** (Linds.) Triebel: on *Lecanora albella* and *L. carpinea*; **subvelutinae** (Vain.) R.Sant.: on foliicolous *Sporopodium*; **sytnikii** S.Y.Kondr.: on *Dufourea*; **tabescens** (Anzi) Jatta: on *Parmelia saxatilis*; **tavaresii** Grube & Hafellner: on *Anthracotheceum* and *Pyrenula*; **tetraspora** S.Y.Kondr. & Kärnefelt: on *Caloplaca chilensis*; **thelotrematis** Coppins: on *Thelotrema*; **toensbergii** Holien & Frisch: on *Mycoblastus affinis*; **tremelloides** Etayo: on *Heterodermia*; **triebeliae** Zhurb.: on *Dactylina*; **urceolata** (Elenkin) Calat., Barreno & V.J.Rico [= *Conida urceolata* Elenkin]: on *Aspicilia*; **varians** (Davies) Nyl.: on *Lecanora bicincta*, *L. helicopsis*, *L. rupicola* and *L. swartzii*; **versoensis** Alstrup [= *A. aggregata* Alstrup, M.S.Christ. & Hafellner]: on *Amandinea punctata*; **xanthoparmeliarum** Etayo: on *Xanthoparmelia*.

Lit.: Alstrup 1993a; Alstrup & Cole 1998; Alstrup & Hansen 2001; Alstrup & Olech 1996; Alves et al. 2014; Aptroot et al. 1995, 1997; Berger & Zimmermann 2016; Brackel 2010a, 2015; Calatayud et al. 1995, 2004a; Candan & Halıcı 2009; Diederich 1995; Ertz et al. 2005; Etayo 1993, 1996, 2002a, 2008, 2010b, 2010c, 2017, 2018b; Etayo & Breuss 1998; Etayo & Diederich 2009; Etayo & Pérez-Ortega 2016; Etayo & Sancho 2008; Fleischhacker et al. 2016; Follmann & Werner 2003; Frisch & Holien 2018; Frisch et al. 2014a; Grube & Matzer 1997; Grube et

al. 1995; Hafellner 2009; Halıcı 2008; Halıcı & Candan 2009, 2011; Hawksworth 1991a; Hawksworth & Iturriaga 2006; Hertel 1969; Horáková 1994; Ihlen et al. 2004b; Joshi et al. 2013; Kalb et al. 1995; Kantvilas & Vězda 1992; Kantvilas & Wedin 2015; Kärnefelt et al. 2002; Kocourková et al. 2012; Kondratyuk 1996a; Kondratyuk & Zelenko 2002; Lendemer et al. 2016; Matzer 1996; Santesson 1993a; Santesson et al. 2004; Triebel et al. 1991; van den Boom & Haji Moniri 2018; van den Boom et al. 2017; Wedin & Hafellner 1998; Wedin & Kondratyuk 1997; Zhurbenko 2002; Zhurbenko & Grube 2010.

Briancoppinsia Diederich, Ertz, Lawrey & van den Boom; type: *B. cytospora*. Mol.: yes (T, L). Asexual, pycnidial. Species: 1-0-0. **cytospora** (Vouaux) Diederich, Ertz, Lawrey & van den Boom [= *Phoma cytospora* (Vouaux) D.Hawksw.]; on parmelioid lichens, *Cladonia*, *Lecanora conizaeoides*, *Lepra*, etc.. Lit.: Diederich et al. 2011b.

Family **Lecanographaceae** Ertz, Tehler, G.Thor & Frisch

Lecanographa Egea & Torrente; type: *L. lyncea* (Sm.) Egea & Torrente (lichenized). Mol.: yes (T). Species: 3-1-0 (38). **dialeuca** (Cromb.) Egea & Torrente: lichen, facultatively lichenicolous on *Roccella*; **imitans** Werner & Follmann: on *Roccella humboldtiana*; **occidentalis** Egea & Torrente: on *Roccellina*; **rinodinae** (Vězda) R.Sant.: on *Phaeorrhiza nimbosa*. Lit.: Egea & Torrente 1994; Follmann & Werner 2003; Gonnet et al. 2017; Hafellner 2009; van den Boom & Etayo 2006; Vězda 1969.

Phacographa Hafellner; type: *P. glaucomaria*. Mol.: yes (T, L). Species: 3-0-0. **glaucomaria** (Nyl.) Hafellner [= *Opegrapha maculans* (Arnold) Poelt & Türk]; on *Lecanora rupicola* s.l. (incl. *L. bicincta*); **protoparmeliae** Hafellner: on *Protoparmelia badia*; **zwackhii** (Zwackh) Hafellner [= *Opegrapha zwackhii* (Zwackh) Hafellner]; on *Phlyctis*. Lit.: Hafellner 2009.

Plectocarpon Fée; type: *P. pseudosticta* [= *Delisea* Fée, nom. illeg.; = *Epiphora* Nyl.; type: *E. encaustica*; = *Lichenomyces Trevis.*; type: *L. parasiticus* Trevis., nom. illeg., i.e. *P. lichenum*]. Mol.: yes (L). Species: 40-0-0 (41). **aequatoriale** Etayo: on *Sticta*; **arthonioides** Diederich: on *Lobaria isidiophora*; **bunodophori** Wedin, Ertz & Diederich: on *Bunodophoron patagonicum*; **cladoniae** R.Sant.: on *Cladonia*; **concentricum** Ertz, Diederich & Wedin: on *Pseudocyphellaria homeophylla*; **coppinsii** Ertz & Diederich: *Pseudocyphellaria crocata*; **crystalliferum** Christnach, Ertz & Diederich: on *Sticta*; **diedertianum** Y.Joshi, Upadhyay & Chandra: on *Myelochroa*; **dimorphosporum** Etayo, Flakus & Kukwa: on *Ricasolia patinifera*; **dirinariiae** Ertz & van den Boom: on *Dirinaria*; **encausticum** (Nyl.) R.Sant. [= *Epiphora encaustica* Nyl.]; on *Brodiaea intestiniformis*; **gallowayi** (S.Y.Kondr.) Ertz & Diederich: on *Pseudocyphellaria dissimilis*; **gayanum** Etayo: on *Siphula*; **hypogymniae** Zhurb. & Diederich: on *Hypogymnia bitteri*; **lambinonii** Diederich & Etayo: on *Lobaria*; **latisporum** Ertz, Diederich & Wedin: on *Pseudocyphellaria coriifolia*; **leuckertii** (S.Y.Kondr. & D. J.Galloway) Ertz & Diederich: on *Pseudocyphellaria intricata* and *P. norvegica*; **lichenum** (Sommerf.) D.Hawksw.: on *Lobaria anomala*, *L. anthraspis* and *L. pulmonaria*; **linitae** (R.Sant.) Wedin & Hafellner: on *Lobaria linita*; **macaronesia**

Diederich, Etayo & Sérus.: on *Lobaria immixta* and *L. macaronesia*; **melanohaleae** Christnach, Ertz & Diederich: on *Melanohalea ushuaiensis*; **nephromeum** (Norman) R.Sant.: on *Nephroma bellum*; **obtectum** Ertz & Diederich: on *Pseudocyphellaria encoensis*; **opegraphoideum** Christnach, Ertz, Diederich & Wedin: on *Pseudocyphellaria homeophylla* and *P. multifida*; **parmotrematis** Etayo, Flakus & Kukwa: on *Parmotrema reticulatum*; **peltigerae** Zhurb., Ertz, Diederich & Miądl.: on *Peltigera leucophlebia*; **pseudocyphellariae** Diederich: on *Pseudocyphellaria gilva*; **pseudoleuckertii** Diederich, Ertz & Wedin: on *Pseudocyphellaria coriifolia*; **pseudosticta** (Fée) Fée: on *Pseudocyphellaria freycinetii* and *P. glabra*; **ramalinae** Etayo & Flakus: on *Ramalina celastri*; **scrobiculatae** Diederich & Etayo: on *Lobarina scrobiculata*; **serusiauxii** Ertz & Diederich: on *Sticta*; **stereocaulicola** Kukwa, Etayo & Flakus: on *Stereocaulon*; **sticticola** Ertz, Wedin & Diederich: on *Sticta*; **tibellii** Ertz & Diederich: on *Pseudocyphellaria rubella*; **triebeliae** Diederich & Ertz: on *Ricasolia quercizans*; **usneae** Diederich & Etayo: on *Usnea exasperata*; **usneustralis** Etayo: on *Usnea*; **venustum** Ertz, Coppins & Diederich: on *Nephroma papillosum*; **violaceum** Ertz, R.Sant., Diederich & Wedin: on *Nephroma antarcticum*. Lit.: Aptroot et al. 1997; Diederich & Ertz 2018; Diederich & Etayo 1994; Ertz & Diederich 2007; Ertz & van den Boom 2012; Ertz et al. 2003, 2005; Etayo 2007, 2017; Etayo & Sancho 2008; Etayo et al. 2018; Hawksworth & Galloway 1984; Joshi et al. 2016b; Kukwa et al. 2012; Santesson 1993a, 1994a; Scholz 1998; Wedin & Hafellner 1998; Zhurbenko et al. 2008.

Family **Opegraphaceae** Stizenb.

Opegrapha Ach. s.l.; type: *O. vulgata* (Ach.) Ach. (lichenized) [= *Kalaallia* Alstrup & D.Hawksw.; type: *K. reactiva*; = *Leciographa* A.Massal.; type: *L. parasitica*; = *Lecoglyphis* Clem.; type: *L. centrifuga* (see under *O. rupestris*); = *Mycopographa* Vain.; type: *M. hymeniicola*; = *Opegraphoidea* Fink; type: *O. staurotheliicola*]. Mol.: yes (T, L). Currently polyphyletic. Species: 72-0-0 (300). **agelaeae** Fée: on pyrenocarpous lichen; **anomea** Nyl. [= *Leciographa pertusariae* Vouaux; = *O. wetmorei* M.S.Cole & D.Hawksw.]; on *Lepra*, *Ochrolechia*, *Pertusaria* and *Varicellaria*; **bacidiarum** R.Sant.: on *Brasiliella brasiliensis*; **blakii** Ertz & Diederich: on cf. *Ochrolechia*; **brevis** Coppins: on *Thelotrema petraeoides*; **brevissima** Kalb & Hafellner: on *Haematomma*; **briancoppinsii** S.Y.Kondr., L.Lökös & J.-S.Hur: on *Porpidia albocaularescens*; **brigantina** Hafellner: on *Brigantiaea*; **bryoriae** Zhurb.: on *Bryoria*; **buelliae** Zhurb.: on *Buellia insignis*; **chapsae** Etayo: on *Chapsa*; **cladoniicola** Ertz & Diederich: on *Cladonia*; **cryptotheciae** Matzer: on foliicolous *Myriostigma candidum*; **diffRACTICOLA** R.C.Harris & Ladd: on *Bacidia diffracta*; **ectolechiacearum** Matzer & R.Sant.: on foliicolous *Calopadia*, *Loflamnia* and *Sporopodium*; **encephalographoidea** Diederich & Aptroot: on *Pyrenula*; **enterographae** Etayo & R.Sant.: on *Enterographa*; **epiporina** Matzer: on foliicolous *Porina*; **foreau** (Moreau) Hafellner & R.Sant. [= *O. trassii* S.Y.Kondr. & Coppins]; on *Heterodermia*; **Leciographa furfuracea** (Anzi) Rehm: on *Lecanora rupicola* and *Rhizocarpon* [a poorly known species pertaining to *Opegrapha* s.l.]; **geographicola** (Arnold) Hafellner [= *Weddellomyces geographicola* (Arnold) Alstrup & D.Hawksw.]; on *Rhizocarpon*; **gregalis** Vain.: on pyrenocarpous lichen; **grossulina** Müll.Arg.: on Pyrenulaceae; **Leciographa gyrolophii**

(A.Massal.) Vouaux: on *Cora* [a poorly known species pertaining to *Opegrapha* s.l.]; **hafellneri** E.Zimm., Etayo & F.Berger: on *Placopsis gelida*; **hellespontica** Vondrák & Kocourk.: on *Variospora aurantia*; **Mycopogon hyme-niicola** Vain.: on *Lecanora* [a poorly known species pertaining to *Opegrapha* s.l.]; **insidens** (J.Steiner) S.Y.Kondr.: on *Athallia pyrcea*, *Pyrenodesmia variabilis* and *Verrucaria buschirensis*; **invadens** Etayo: on *Pannaria farinosa*; **kalbii** Matzer: on foliicolous *Byssoloma*; **lamyi** (Nyl.) Triebel: on corticolous *Lecanora*; **lepidella** Nyl.: on cf. *Pertusaria*; **lichenicola** Thor, Lücking & Tat.Matsumoto: on *Porina*; **lopezariae** Etayo & Sipman: on *Lopezaria*; **maligna** Triebel: on *Lecidea fuscoatra*; **matzeri** Lücking: on foliicolous *Amazonomyces sprucei*; **mazosiae** Matzer: on foliicolous *Mazosia*; **melanospila** Müll.Arg.: on *Parmotrema*; **Leciographa nephromatis** Stein: on *Nephroma* [a poorly known species pertaining to *Opegrapha* s.l.]; **nigeriensis** C.W.Dodge: on *Cryptothecia*; **parasitica** (A.Massal.) H.Olivier [= *Leciographa parasitica* A.Massal.]; on *Aspicilia calcarea*; **perturbans** Follmann: on *Ingaderia pulcherrima*; **pertusariicola** Coppins & P.James: on *Pertusaria leioplaca*; **phaeophysciae** R.Sant., Diederich, Ertz & Christnach: on *Phaeophyscia hispidula*; **phlyctidicola** (Vouaux) Etayo: on *Phlyctis*; **phyllobathelii** Matzer & R.Sant.: on foliicolous *Phyllobathelium*; **phylloporinae** Müll.Arg.: on foliicolous *Porina*; **physcidiae** Kalb & Elix: on *Physcidia australasica*; **pigozziana** Etayo & Aptroot: on *Thelotrema*; **plectocarpoidea** Diederich: on *Phaeographis*; **porinicola** Matzer: on foliicolous *Porina*; **pulvinata** Rehm var. **pulvinata** [=? *Homostegia dermatocarponis* Alstrup & M.Cole (as 'dermatocarpae'); =? *Phaeospora dermatocarponis* (R.G.Werner) S.Y.Kondr.]; on *Dermatocarpon*, possibly also *Catapyrenium* and *Endocarpon*; **pulvinata** var. **placidiicola** Zhurb.: on *Placidium*; **reactiva** (Alstrup & D.Hawksw.) Etayo & Diederich [= *Kalaallia reactiva* Alstrup & D.Hawksw.]; on *Hymenelia lacustris*; **reinkellae** Follmann: on *Rocella lirellina*; **rotunda** Hafellner: on *Physconia distorta*; **rouxiana** Nav.-Ros. & Hladun: on *Polyblastia nidulans*; **rupestris** Pers. [=? *O. centrifuga* A.Massal.; = *Lecoglyphis centrifuga* (A.Massal.) Clem.]; on *Verrucaria*; **sipmanii** Matzer: on foliicolous *Porina*; **sphaerophorica** Isbrand & Alstrup: on *Sphaerophorus globosus*; **Opegraphoidea staurotheliicola** Fink [=? *Opegrapha romsiae* S.Y.Kondr. & Kudratov (as 'romsae')]; on *Staurothele* [a poorly known species pertaining to *Opegrapha* s.l.]; **stellanigra** Etayo: on *Sticta*; **stereocaulicola** Alstrup & D.Hawksw.: on *Stereocaulon*; **stigmodes** Nyl.: on *Porina*; **strigulae** Matzer & R.Sant.: on foliicolous *Strigula*; **submaritima** Hafellner: on *Tephromela atra*; **tenuior** Stirt.: on *Thelotrema*; **thelotrematis** Coppins: on *Thelotrema lepadinum* and *T. macrosporium*; **uniseptata** Matzer: on foliicolous *Strigula*; **velata** (Müll.Arg.) Vain.: on foliicolous *Actinoplaca*, *Calenia*, ?*Echinoplaca* and *Gyalectidium*; **verseghyklarae** S.Y.Kondr., L.Lökös & J.-S.Hur: on *Ochrolechia pallezensis*; **vulpina** Vondrák, Kocourk. & Tretiach: on *Caloplaca* s.l., incl. *Leproplaca cirrochroa*, *Pyrenodesmia erodens* and *Variospora flavescens*.
Lit.: Alstrup & Cole 1998; Alstrup & Hawksworth 1990; Aptroot et al. 1997; Awasthi 1991; Berger & Zimmermann 2016; Clauzade et al. 1989; Coppins & Kondratyuk 1998; Ertz 2009; Ertz & Diederich 2003; Ertz et al. 2004, 2005; Etayo 1996, 2007, 2010b, 2017; Etayo & Aptroot 2006; Etayo & Sancho 2008; Follmann & Werner 2003; Hafellner 1985b, 1994a, 2007, 2009; Harris & Ladd 2007; Isbrand & Alstrup 1992; Kalb & Elix 1995; Kalb et al. 1995; Kondratyuk & Galloway 1995c; Kondratyuk & Kudratov 2002; Kondratyuk & Zelenko 2002; Kondratyuk et al. 2015, 2016b; Lücking 1998; Matzer 1996; Navarro-Rosinés & Hladun 1995; Orange 2002; Triebel 1989;

Vondrák & Kocourková 2008; Zhurbenko 2009b, 2013a; Zhurbenko & Vershinina 2014.

Paralecanoglyphis Ertz & Tehler; type: *P. grumulosa*. Mol.: yes (T, L).
Species: 1-1-0. *grumulosa* (Dufour) Ertz & Tehler [= *Opegrapha grumulosa* Dufour; incl. *Lecanoglyphis hemisphaerica* (Laundon) Egea & Torrente]: initially lichenicolous on *Rocella*, rarely on *Dirina*, *Gorgadesia* or *Opegrapha*, eventually developing an own thallus; **thelopsisocia** (B. de Lesd.) Cl.Roux, comb. provis. [= *Opegrapha grumulosa* var. *thelopsisocia* B. de Lesd.; = *O. thelopsisocia* (B. de Lesd.) B. de Lesd.]; on *Thelopsis isiaci*.
Lit.: Egea & Torrente 1994, Roux 2014.

Family Roccellaceae Chevall.

Cresponea Egea & Torrente; type: *C. premnea* (Ach.) Egea & Torrente (lichenized). Mol.: yes.
Species: 1-0-0 (21). **lichenicola** Aptroot & M.Cáceres: on *Pyrenula*.
Lit.: Cáceres et al. 2014.

Enteroglyphis Fée; type: *E. crassa* (DC.) Fée (lichenized). Mol.: yes (T).
Species: 9-0-1 (55). **bagliettoae** F.Seavey & J.Seavey: on *Bagliettoa*; **brezhonega** Sparrius & Aptroot: on *Porina rosei* and possibly other lichens with *Trentepohlia*; **confusa** Ertz & Van den Broeck: on *Arthonia ochracea*; **epigraphis** Etayo & Sipman: on *Graphis*; **epiphylia** (Sérus.) Ertz, Diederich & Sparrius: on foliicolous *Coenogonium geralense* [= *C. flavicans*]; **fellhaneroides** Yeshitela, Eb.Fisch., Killmann & Sérus.: on *Coenogonium*; **mazosiae** Matzer & R.Sant.: on foliicolous *Mazosia*; **meklitiae** Yeshitela, Eb.Fisch., Killmann & Sérus.: probably lichenicolous over *Coenogonium*; **osagensis** C.A.Morse: on *Bacidina*; **punctata** Ertz & Diederich: on *Lobaria*.
Lit.: Cáceres et al. 2001; Ertz et al. 2005; Etayo 2017; Matzer 1996; Morse 2013; Seavey et al. 2017; Sparrius & Aptroot 2007; Van den Broeck & Ertz (2018).

Mazosia A.Massal.; type: *M. rotula* (Mont.) A.Massal. (lichenized). Mol.: yes.
Species: 1-0-0 (27). **adelphoparasitica** Matzer: on foliicolous *Mazosia rotula*.
Lit.: Matzer 1996.

Schismatomma A.Massal. s.l.; type: *S. pericleum* (Ach.) Branth & Rostr. (lichenized). Mol.: yes (T).
Species: 1-0-0 (10). **physconiicola** Ertz & Diederich: on *Physconia*.
Lit.: Ertz & Diederich 2006.

Sigridea Tehler; type: *S. californica* (Tuck.) Tehler (lichenized). Mol.: yes (T).
Species: 1-0-0 (6). **labyrinthica** (Follmann) Ertz & Diederich [= *Plectocarpon labyrinthicum* Follmann]: on *Rocella portentosa*.
Lit.: Ertz et al. 2005.

Order Arthoniales genera incertae sedis

Arthophacopsis Hafellner; type: *A. parmiliarum*. Mol.: no.
Species: 1-0-0. **parmiliarum** Hafellner: on *Parmelia* s.str.
Lit.: Hafellner 1998a.

Arthothelium A.Massal.; type: *A. spectabile* A.Massal. (lichenized). Mol.: yes (T). Currently polyphyletic. Species: 1-0-0 (140). **hymeniicola** Ertz & Fryday: on *Bacidia* (hymenium). Lit.: Ertz & Fryday 2017.

Mixtoconidium Etayo; type: *M. canariense*. Mol.: no. Species: 2-0-0. **insidiens** (Vouaux) Etayo & van den Boom [= *M. canariense* Etayo]: on *Ramalina*; **nashii** (Hafellner) Etayo & van den Boom [= *Plectocarpon nashii* Hafellner]: on *Niebla robusta*. Lit.: Ertz & Diederich 2007; Etayo 1995a; van den Boom & Etayo 2017.

Paradoxomyces Matzer; type: *P. nymanii*. Mol.: no. Species: 1-0-0. **nymanii** Matzer: on foliicolous *Strigula*. Lit.: Matzer 1996.

Perigrapha Hafellner [a hemihomonym of *Perigrapha* Lederer (Lepidoptera)]; type: *P. superveniens*. Mol.: no. Species: 5-0-0. **ctrariae** Zhurb.: on *Cetraria laevigata*; **lobariae** Zhurb.: on *Lobaria japonica* agg.; **nitida** Ertz, Diederich, Christnach & Wedin: on *Pseudocyphellaria glabra*; **phaeophysciae** Etayo & Pérez-Vargas: on *Phaeophyscia* cf. *orbicularis*; **superveniens** (Nyl.) Hafellner: on *Parmelia* s.str. Lit.: Ertz et al. 2005; Hafellner 1996a; Pérez-Vargas et al. 2013; Zhurbenko & Ohmura 2018; Zhurbenko et al. 2015a.

Phacothecium Trevis.; type: *P. varium*. Mol.: no. Species: 1-0-0. **varium** (Tul.) Trevis. [= *Arthonia varia* (Tul.) Jatta; = *Opegrapha physciaria* (Nyl.) D.Hawksw. & Coppins]: on *Xanthoria*. Lit.: Hafellner 2009.

Trichophyma Rehm; type: *T. bunchosiae*. Mol.: no. Species: 2-0-0. **bunchosiae** Rehm: on foliicolous *Strigula*; **similis** Matzer: on foliicolous *Strigula*. Lit.: Matzer 1996.

Order Lichenostigmatales Ertz, Diederich & Lawrey

Family Phaeococcomycetaceae McGinnis & Schell

Etayo Diederich & Ertz; type: *E. tryptethelii*. Mol.: yes (T, L). Species: 1-0-0. **tryptethelii** (Flakus & Kukwa) Diederich & Ertz [= *Phaeosporobolus tryptethelii*. Flakus & Kukwa]: on Graphidaceae, *Lecanora*, *Pertusaria*, *Tryptetheliaceae* and other crustose lichens. Lit.: Ertz et al. 2014b; Flakus & Kukwa 2012.

Lichenostigma Hafellner; type: *L. maureri* [= *Diederimyces* Etayo (not validly published)]; type: *D. fuscideae* Etayo; = *Phaeosporobolus* D.Hawksw. & Hafellner; type: *P. usneae* D.Hawksw. & Hafellner]. Mol.: yes (T, L). Many lichenicolous *Lichenostigma* species do not belong to *Lichenostigma* s.str., but obviously pertain to Lichenotheliaceae; they are treated under that family within *Lichenostigma* s.l. Species: 5-0-0. **alpinum** (R.Sant., Alstrup & D.Hawksw.) Ertz & Diederich [= *Phaeosporobolus alpinus* R.Sant., Alstrup & D.Hawksw.; incl. *Diederimyces fuscideae* Etayo, *D. microsporus* Etayo, *P. minutus* Etayo]: on *Lepra*, *Ochrolechia*, *Varicellaria* and other lichens; **chlaroterae** (F.Berger & Brackel) Ertz & Diederich [= *P. chlaroterae* F.Berger & Brackel]: on *Lecanora* and other lichens;

fellhanerae (R.C.Harris & Lendemer) Ertz & Diederich [= *P. fellhanerae* R.C.Harris & Lendemer]: on *Fellhanera*; **hyalosporum** Kalb & Hafellner [as '*hyalospora*']: on *Haematomma eremaeum*; **maureri** Hafellner [= *P. usneae* D.Hawksw. & Hafellner]: mainly on fruticose lichens. Lit.: Ertz et al. 2014b; Etayo 1995b; Etayo & Sancho 2008; Hawksworth & Hafellner 1986; Kalb et al. 1995.

Class DOTHIDEOMYCETES O.E.Erikss. & Winka

Order Abrothallales Pérez-Ort. & Suija [= Lichenoconiales Diederich, Lawrey & K.D.Hyde]

Family Abrothallaceae Pérez-Ort. & Suija [= Lichenoconiaceae Diederich & Lawrey]

Abrothallus De Not.; type: *A. bertianus* [= *Epinephroma* Zhurb.; type: *E. kamchatica*; = *Pseudolecidea* Marchand; type: *P. parmeliarum*, i.e. *A. parmeliarum*; = *Vouauxiomyces* Dyko & D.Hawksw.; type: *V. truncatus*, i.e. *A. microsporus*]. Mol.: yes (L). Species: 42-0-0. **acetabuli** Diederich: on *Pleurosticta acetabulum*; **bertianus** De Not. [= *A. glabratulae* I.Kotte]: on *Melanelixia*, also reported from *Melanohalea* and other parmelioid lichens; **boomii** Pérez-Ortega & Suija: on *Nephroma*; **brattii** (S.Y.Kondr.) Suija & Pérez-Ortega: on *Pseudocyphellaria faveolata*; **bryoriarum** Hafellner: on *Bryoria*; **buellianus** De Not.: on *Parmelia*; **caerulescens** I.Kotte [= *A. tulasnei* M.S.Cole & D.Hawksw.]: on *Xanthoparmelia*; **canariensis** Pérez-Ortega, van den Boom & Suija: on *Crocodia aurata*; **chrysanthus** Stein: on *Usnea*; **cladoniae** R.Sant. & D.Hawksw.: on *Cladonia*; **doliiformis** Pérez-Ortega & Suija: on *Sticta*; **eriodermiae** Suija, Etayo & Pérez-Ortega: on *Erioderma*; **ertzii** Suija & Pérez-Ortega: on *Lobaria pulmonaria*; **etayoi** Pérez-Ortega & Suija: on *Sticta*; **granulatae** Wedin: on *Pseudocyphellaria*; **halei** Pérez-Ortega, Suija, D.Hawksw. & R.Sant.: on *Lobaria*; **heterodermicola** Etayo & F.Berger: on *Leucodermia leucomelos*; **hypotrachynae** Etayo & Diederich: on *Hypotrachyna*; **kamchatica** (Zhurb. & Stepanchikova) Pérez-Ortega & Suija [= *Epinephroma kamchatica* Zhurb. & Stepanchikova]: on *Nephroma*; **lobariae** (Diederich & Etayo) Diederich & Ertz, comb. nov. [= *Phoma lobariae* Diederich & Etayo]: on *Lobaria*; **macrosporus** Etayo & R.Sant.: on *Lobariella*; **microsporus** Tul. [= *Vouauxiomyces truncatus* (B. de Lesd.) Dyko & D.Hawksw.]: on *Flavoparmelia caperata*; **nephromatis** Suija & Pérez-Ortega: on *Nephroma*; **niger** Etayo: on *Hypotrachyna*, and possibly *Parmotrema* and *Usnea*; **parmeliarum** (Sommerf.) Arnold [= *Pseudolecidea parmeliarum* (Sommerf.) Marchand; = *Abrothallus cetrariae* I.Kotte]: on *Nesolechia* (mainly *N. oxyspora*, rarely *N. oxyspora* var. *fusca* or *N. thallicola*, with or without visible galls) over *Parmelia*, *Parmotrema*, *Platismatia*, *Xanthoparmelia*, etc.; **parmotrematis** Diederich: on *Parmotrema*; **peyritschii** (Stein) I.Kotte: on *Cetraria*; **pezizicola** Diederich & R.C.Harris: on *Cladonia peziziformis*; **prodiens** (Harm.) Diederich & Hafellner: on *Hypogymnia*; **psoromatis** (Zhurb. & U.Braun) Diederich & Zhurb., comb. nov. [= *Phoma psoromatis* Zhurb. & U.Braun]: on *Psoroma*; **puntilloii** Brackel: on *Lobaria pulmonaria*; **ramalinae** Diederich: on *Ramalina*; **Vouaux-**

iomycetes santessonii D.Hawksw.: on *Platismatia glauca*; **secedens** Wedin & R.Sant.: on *Pseudocyphellaria*; **stereocaulorum** Etayo & Diederich: on *Stereocaulon*; **stictarum** Etayo: on *Sticta*; **strobltii** Hafellner: on *Menegazzia terebrata*; **suecicus** (Kirschst.) Nordin [= *Vouauxiomyces ramalinae* (Nordin) D.Hawksw.; \equiv *Phoma ramalinae* Nordin]: on *Ramalina*; **teloschistis** Brackel, Pérez-Ortega & Suija: on *Seirophora* and *Teloschistes*; **usneae** Rabenh. var. **usneae**: on *Usnea*; **usneae** var. **tetraspora** Etayo & Osorio: on *Usnea*; **welwitschii** Mont.: on *Sticta*.
Lit.: Brackel 2015; Brackel & Puntillo 2016; Diederich 1990, 2003, 2004a, 2011; Diederich et al. 2017; Etayo 2002, 2010b, 2017; Etayo & Diederich 1995; Etayo & Osorio 2004; Etayo & van den Boom 2006; Hafellner 1994a; Hafellner et al. 2008; Hawksworth 1990a; Ihlen & Wedin 2008; Kondratyuk 1996b; Nordin 1964; Pérez-Ortega et al. 2014; Suija 2006; Suija et al. 2011, 2015a; Wedin 1994; Zhurbenko & Braun 2013; Zhurbenko et al. 2012.

Lichenocodium Petr. & Syd.; type: *L. lichenicola*. Mol.: yes (L). Species: 15-0-0. **aeruginosum** Diederich, M.Brand, van den Boom & Lawrey: on *Cladonia*; **cargillianum** (Linds.) D.Hawksw.: on *Letharia*, *Parmotrema*, *Platismatia*, *Ramalina* and *Usnea*; **christiansenii** M.S.Cole & D.Hawksw.: on *Nodobryoria abbreviata*; **echinosporum** D.Hawksw.: on *Cladia muelleri*; **edgewoodensis** Alstrup & M.S.Cole: on *Parmelia sulcata*; **erodens** M.S.Christ. & D.Hawksw.: on various lichens; **folmannii** S.Y.Kondr. & D.J.Galloway: on *Lobaria pulmonaria*; **laevisporum** Kalb & Hafellner: on *Haematomma*; **lecanorae** (Jaap) D.Hawksw.: on various lichens; **lichenicola** (P.Karst.) Petr. & Syd.: on *Physcia*; **plectocarpoides** S.Y.Kondr. & D.J.Galloway: on *Pseudocyphellaria*; **pyxidatae** (Oudem.) Petr. & Syd.: on *Cladonia*; **reichlingii** Diederich: on *Ramalina fraxinea*; **usneae** (Anzi) D.Hawksw.: on various lichens; **xanthoriae** M.S.Christ.: on various lichens.
Lit.: Alstrup & Cole 1998; Christiansen 1956, 1980; Cole & Hawksworth 2004; Diederich 1986; Hawksworth 1977b, 1981; Kalb et al. 1995; Kondratyuk & Galloway 1995b; Kondratyuk et al. 1994; Lawrey et al. 2011.

Order Acrospermales Minter, Peredo & A.T.Watson

Family Acrospermaceae Fückel

Gonatophragmium Deighton; type: *G. mori* (Sawada) Deighton. Mol.: yes. Asexual, hyphomycetous. Species: 1-0-0 (8). **lichenophilum** F.Berger & U.Braun: on *Xanthoria parietina*.
Lit.: Berger et al. 2015.

Order Asterotexiales Firmino, O.L.Pereira & Crous

Liu et al. (2017) considered Asterotexiales to be a younger synonym of Asterinales D.Hawksw. & O.E.Erikss. However, the genus *Asterina* appeared to be polyphyletic in a phylogenetic analysis (Hyde et al. 2016). While most *Asterina* species clustered with Asterotexiales, sequences of two species, including the generic type, belonged to a distinct, non-related lineage. Hyde et al. (2016) concluded that sequences of the generic type may be from a contaminant and that Asterotexiales should consequently be synonymized

under Asterinales, a view followed by Liu et al. (2017). However, this synonymy can only be established after proving that those type sequences represent a contaminant, and obtaining new, reliable sequences of the type of *Asterina*.

Order Asterotexiales genera incertae sedis

Buelliella Fink; type: *B. minimula* (lectotypified by Hafellner 1979). Mol.: yes (T). Currently polyphyletic. Species: 12-0-0. **colombiana** Etayo: on *Phlyctis andensis*; **dirinariae** Diederich: on *Dirinaria picta*; **eximia** Kalb & Hafellner: on *Pyxine cocoes*; **heppiae** van den Boom: on *Heppia arenacea*; **inops** (Triebel & Rambold) Hafellner: on *Caloplaca* s.l.; **lecanorae** Suija & Alstrup: on *Lecanora*; **minimula** (Tuck.) Fink: on *Pertusaria*; **physciicola** Poelt & Hafellner: on *Phaeophyscia* and *Physcia*; **poetschii** Hafellner: on *Endocarpon*; **protoparmeliopseos** Etayo & Pérez-Ortega: on *Protoparmeliopsis*; **pusilla** Hafellner: on *Brigantiaea leucoanthera*; **trypethelii** (Tuck.) Hafellner: on *Trypethelium*.
Lit.: Aptroot et al. 1997; Ertz & Diederich 2015; Etayo 2002a; Hafellner 1979, 1985b; Hafellner et al. 2008; Kalb 1990; Pérez-Ortega & Etayo 2010; Suija & Alstrup 2004; van den Boom 2010.

Hemigrapha (Müll.Arg.) D.Hawksw.; type: *H. asteriscus* (lectotypified by Ertz & Diederich 2015). Mol.: yes (T). Species: 8-0-0. **asteriscus** (Müll.Arg.) D.Hawksw.: on *Peltigera*; **atlantica** Diederich & Wedin: on *Sticta canariensis*; **nephromatis** Wedin & Diederich: on *Nephroma australe*; **phaeospora** Matzer & Lücking: on foliicolous *Strigula phyllogena*; **pilocarpacearum** M.Cáceres & Lücking: on *Byssoloma* and *Fellhanera*; **pseudocyphellariae** Diederich & Wedin: on *Pseudocyphellaria argyraceae*; **strigulae** Matzer: on foliicolous *Strigula*; **tenellula** (Müll.Arg.) Matzer: on foliicolous *Porina*.
Lit.: Cáceres & Lücking 2000; Diederich & Wedin 2000; Eriksson et al. 2001; Ertz & Diederich 2015; Hawksworth 1975; Matzer 1996.

Karschia Körb.; type: *K. talcophila* (lectotypified by Hafellner 1979). Mol.: yes (T). Species: 3-0-0 (4). **alpicolae** D.Hawksw. & Alstrup: on *Allantoparmelia alpicola*; **santessonii** Hafellner: on *Porpidia*; **talcophila** (Ach.) Körb.: on *Diploschistes*.
Lit.: Alstrup & Hawksworth 1990; Ertz & Diederich 2015; Hafellner 1979; Santesson 1994a.

Labrocarpon Etayo & Pérez-Ortega; type: *L. canariense*. Mol.: yes (T, L). Species: 1-0-0. **canariense** (D.Hawksw.) Etayo & Pérez-Ortega: on *Pertusaria*.
Lit.: Ertz & Diederich 2015; Hawksworth 1982b; Pérez-Ortega & Etayo 2010.

Melanographa Müll.Arg.; type: *M. tribuloides* (lectotypified by Ertz & Diederich 2015). Mol.: no. Species: 1-0-0. **tribuloides** (Tuck.) Müll.Arg.: on *Anthracotheicum* and *Pyrenula*.
Lit.: Ertz & Diederich 2015.

Melaspilea Nyl. s.l.; type: *M. arthonioides* Nyl. (lichenized). Mol.: yes (T, L). The type belongs to Melaspileaceae

(Eremithallales). All lichenicolous species need transfer to other genera, probably within Asterotexiales.

Species: 10-0-0 (150). **amarkantakensis** S.Joseph & G.P.Sinha: on *Pertusaria amarkantakana*; **cupularis** Müll.Arg.: on *Pyrenula*; **epigena** Müll.Arg.: on *Reimnitzia santensis*; **epigraphella** (Nyl.) Müll.Arg.: on *Acanthothecis consocians*; **galligena** Zhurb. & I.Zhdanov.: on *Pertusaria*; **insitiva** Stirt.: on *Pertusaria leioplaca*; **leciographoides** Vouaux: on *Verrucaria*; **lekae** Brackel & Kalb: on *Sarcographa*; **nitidochapsae** Pushpi Singh, Y.Joshi & Kr.P.Singh: on *Nitidochapsa leprieurii*; **tucumana** Flakus, Etayo & Kukwa: on *Pertusaria*.

Lit.: Clauzade et al. 1989; Ertz & Diederich 2015; Flakus et al. 2014; Joseph & Sinha 2015; Kalb et al. 2012; Singh et al. 2017; Zhurbenko & Zhdanov 2013.

Melaspileopsis (Müll.Arg.) Ertz & Diederich; type: *M. diplasio-spora* (Nyl.) Ertz & Diederich (saprotrophic). Mol.: yes (T, L). Species: 1-0-0. cf. **diplasio-spora** (Nyl.) Ertz & Diederich: on *Graphis elegans*.

Lit.: Ertz & Diederich 2015.

Stictographa Mudd; type: *S. lentiginosa*. Mol.: yes (T). Species: 2-0-0. **dirinariicola** Diederich & Ertz: on *Dirinaria picta*; **lentiginosa** (Leight.) Müll.Arg.: on *Phaeographis dendritica*.

Lit.: Ertz & Diederich 2015; Diederich et al. 2017.

Taeniolella S.Hughes s.l.; type: *T. exilis* (P.Karst.) S.Hughes (saprotrophic). Mol.: yes (T, L). The type belongs to Kirschsteinioteliaceae (Dothideomycetes). Most lichenicolous species need transfer to other genera within Asterotexiales.

Species: 29-0-1 (45). **arctoparmeliae** Heuchert & Zhurb.: on *Arctoparmelia separata*; **arthoniae** (M.S.Christ. & D.Hawksw.) Heuchert & U.Braun [= *Cladosporium arthoniae* M.S.Christ. & D.Hawksw.]: on *Dendrographa decolorans*, *Lecanactis abietina*, *Lecanographa lyncea* and *Pachnolepia pruinata*; **atricerebrina** Hafellner: on *Tephromela atra*; **breviuscula** (Berk. & M.A.Curtis) S.Hughes: facultatively lichenicolous; **caespitosa** M.S.Cole & D.Hawksw.: on *Pertusaria*; **christiansenii** Alstrup & D.Hawksw.: on *Stereocaulon* (incl. on *Arthonia* lichenicolous on *Stereocaulon*); **chrysothricis** Diederich: on *Chrysothrix candellaris*; **cladinicola** Alstrup: on *Cladonia* subgen. *Cladina* and on the *C. uncialis* group; **delicata** M.S.Christ. & D.Hawksw.: on various lichens; **diederichiana** Etayo & Calat.: on *Placopsis*; **friesii** (Hepp) Hafellner: on *Strigula stigmatella*; **hawksworthiana** Heuchert, Ertz & Common: on *Phaeographis*; **ionaspisicola** Alstrup & E.S.Hansen: on *Ionaspis odora*; **lecanoricola** Heuchert & Diederich: on *Lecanora rupicola*; **pertusariicola** D.Hawksw. & H.Mayrhofer: on *Lecanora*, *Lepra*, *Ochrolechia*, *Ophioparma*, *Pertusaria* and *Varicellaria*; **phaeophysciae** D.Hawksw.: mainly on *Phaeophyscia*, also on *Hyperphyscia*, *Pectenia*, *Pertusaria*, *Physcia* and *Physconia*; **pseudocyphellariae** Etayo: on *Nephroma antarcticum* and *Pseudocyphellaria hillii*; **punctata** M.S.Christ. & D.Hawksw.: on *Graphis*, more rarely on *Arthonia*, *Fissurina*, *Pertusaria* and *Phaeographis*; **pyrenulae** Heuchert & Diederich: on *Pyrenula*; **rolfi** Diederich & Zhurb.: on *Cetraria*; **santessonii** Etayo & Heuchert: on *Roccellina cerebriformis*; **serusiauxii** Diederich: on *Dendrographa decolorans*, *Tylophoron* and other sterile crustose lichens with *Trentepohlia*; **strictae** Alstrup: on *Cladonia stricta*; **thelotrematis** Heuchert & Brackel: on *Thelotrema*; **toruloides** Heuchert & Diederich: on *Thelotrema*; **trapeliopses** Diederich: on *Trapeliopsis*; **umbilicariae** Heuchert &

Etayo: on *Umbilicaria*; **umbilicariicola** Heuchert & Etayo: on *Umbilicaria*; **verrucosa** M.S.Christ. & D.Hawksw.: on *Aspicilia*, *Micarea*, *Pachnolepia* and *Rhizocarpon*; **weberi** Heuchert & Sparrius: on *Thelotrema weberi*.

Lit.: Alstrup 1993b; Alstrup & Hansen 2001; Alstrup & Hawksworth 1990; Cole & Hawksworth 2001; Diederich 1989, 1990, 1992b; Diederich & Zhurbenko 1997, 2001; Ertz et al. 2016; Etayo 2010b; Etayo & Calatayud 2005; Etayo & Sancho 2008; Hafellner 1998b, 2007; Hawksworth 1979a; Heuchert et al. 2018; Zhurbenko & Alstrup 2004.

Order Botryosphaeriales C.L.Schoch, Crous & Shoemaker

Family Phyllostictaceae Fr.

Phyllosticta Pers.; type: *P. convallariae* Pers. Mol.: yes. Asexual, pycnidial.

Species: 1-0-0 (100). **galligena** F.Moreau: on *Parmotrema* [a poorly known species that might not belong here].

Lit.: Moreau 1951.

Order Capnodiales Woron.

Family Cladosporiaceae Nann.

Cladosporium Link; type: *C. herbarum* (Pers.) Link. Mol.: yes (T, L).

Species: 1-0-2 (300). **antarcticum** K.Schub., Crous & U.Braun: isolated from *Gondwania regalis*, probably lichenicolous; **licheniphilum** Heuchert & U.Braun: on macrolichens; **macrocarpum** Preuss: facultatively lichenicolous on *Cetraria islandica* and *Xanthoria parietina*.

Lit.: Bensch et al. 2012; Brackel 2014; Heuchert & Braun 2006; Zhurbenko 2012.

Verrucocladosporium K.Schub., Aptroot & Crous; type: *V. dirinae*. Mol.: yes (T).

Species: 1-0-1. **dirinae** K.Schub., Aptroot & Crous: isolated from *Dirina massiliensis*, probably lichenicolous; **rocellae** U.Braun, Diederich & Heuchert: on *Roccella*.

Lit.: Braun et al. 2009; Crous et al. 2007.

Family Dissoconiaceae Crous & de Hoog

Ramichloridium de Hoog; type: *R. apiculatum* (J.H.Mill., Giddens & A.A.Foster) de Hoog. Mol.: yes (T).

Species: 2-0-0 (35). **cladoniicola** U.Braun & Heuchert: on *Cladonia portentosa*; **tropicum** U.Braun & Diederich: on crustose lichen with *Trentepohlia*.

Lit.: Braun et al. 2009; Diederich et al. 2017.

Family Mycosphaerellaceae Lindau

Pseudocercospora Speg.; type: *P. vitis* (Lév.) Speg. Mol.: yes (T). Species: 1-0-0 (1500). **lichenum** (Keissl.) D.Hawksw.: on various lichens.

Lit.: Etayo 2002; Hawksworth 1979a.

Sphaerulina Sacc. s.l.; type: *S. myriadea* (DC.) Sacc. Mol.: yes (T). The two lichenicolous species are poorly known and might not belong here.
Species: 2-0-0 (65). **dubiella** (Nyl.) W.Wats.: on a crustose lichen; **lepidiotae** (Anzi) Vain.: on *Fuscopannaria praetermissa*.
Lit.: Clauzade et al. 1989.

Wernerella Nav.-Ros., Cl.Roux & Giralt; type: *W. maheui*. Mol.: no.
Species: 2-0-0. **acarosporae** Etayo: on *Acarospora nodulosa*; **maheui** (Werner) Nav.-Ros., Cl.Roux & Giralt: on *Rinodina*.
Lit.: Etayo 2010c; Navarro-Rosinés et al. 1996a, 1998d.

Family Teratosphaeriaceae Crous & U.Braun

Austrostigmidium Pérez-Ortega & Garrido-Benavent; type: *A. mastodiae*. Mol.: yes (T, L).
Species: 1-0-0. **mastodiae** Pérez-Ortega & Garrido-Benavent: on *Mastodia tessellata*.
Lit.: Pérez-Ortega et al. 2015.

Hobsoniopsis D.Hawksw.; type: *H. santessonii*. Mol.: yes (T, L).
Species: 1-0-0. **santessonii** (Lowen & D.Hawksw.) D.Hawksw.: on *Peltigera*, mainly *P. scabrosa*.
Lit.: Lowen et al. 1986; Sikaroodi et al. 2001.

Xanthoriicola D.Hawksw.; type: *X. physciae*. Mol.: yes (T, L).
Species: 1-0-0. **physciae** (Kalchbr.) D.Hawksw.: on *Xanthoria parietina*.
Lit.: Hawksworth 1979a; Hawksworth & Punithalingam 1973; Ruibal et al. 2011.

Order Collemopsidiales Pérez-Ort., Garrido-Ben. & Grube

Family Xanthopyreniaceae Zahlbr.

Collemopsidium Nyl.; type: *C. iocarpum* (Nyl.) Nyl. (lichenized). Mol.: yes.
Species: 1-0-0 (27). **cephalodiorum** (Triebel & Grube) Grube [\equiv *Cercidospora cephalodiorum* Triebel & Grube]: on *Pilophorus cephalodiorum*.
Lit.: Grube 2005.

Didymellopsis (Sacc.) Clem. & Shear; type: *D. latitans*. Mol.: no.
Species: 8-0-0. **Pharcidia collematis** Dughi: on *Lempholemma chalazanum* [a poorly known taxon placed provisionally here]; **collematum** (J.Steiner) Grube & Hafellner: on *Collema*; **latitans** (Nyl.) Clem. & Shear: on *Lichinella* and *Lempholemma*; **nephromatis** Zhurb. & Etayo: on *Nephroma cellulorum*; **perigena** (Nyl.) Grube & Hafellner: on *Placidium squamulosum*; **pulposi** (Zopf) Grube & Hafellner: on *Collema*, *Enchylium*, *Lathagrium*, *Lempholemma* and *Scytinium*; **Verrucaria symbiotica** Nyl. [=? *Didymella pulposi* var. *garovaglii* Vouaux; =? *Lichenochora hypanica* S.Y.Kondr., L.Lökös & J.-S.Hur.: on *Endocarpon* [poorly known taxa in need of a revision, placed provisionally here]; **viridireagens** Etayo: on *Leptogium*.
Lit.: Etayo 2017; Grube & Hafellner 1990; Roux 2014; Zhurbenko et al. 2015b.

Zwackhiomyces Grube & Hafellner; type: *Z. coepulonus*. Mol.: yes (T, L).

Species: 35-0-0. **arenicola** R.C.Harris: on unidentified areolate, saxicolous thallus; **argentinae** (Räsänen) D.Hawksw. & V.Atienna: on *Acarospora*; **aspiciliae** Halıcı & Candan: on *Aspicilia*; **berengerianus** (Arnold) Grube & Triebel: on *Lecidea berengeriana*; **calcariae** (Flagey) Hafellner & Nik.Hoffm.: on *Aspicilia*; **calcisedus** Cl.Roux: on *Verrucariaceae*; **cervinae** Calat., Triebel & Pérez-Ortega: on *Acarospora*; **cladoniae** (C.W.Dodge) Diederich: on *Cladonia*; **coepulonus** (Norman) Grube & R.Sant.: on *Calogaya*, *Caloplaca* s.str. and *Rusavskia elegans*; **diederichii** D.Hawksw. & Iturr.: on *Cladonia*; **dispersus** (Körb.) Triebel & Grube: on *Protoblastenia rupestris*; **echinulatus** Brackel: on *Physconia*; **euplocinus** Hafellner, Grube & Egan: on *Speerschneidera euploca*; **heppiae** van den Boom: on *Heppia arenacea*; **inconspicuus** Grube & Hafellner: on *Myriolecis dispersa*; **kantvilasii** S.Y.Kondr.: on *Parmotrema*; **kizskianus** D.Hawksw. & Miädl.: on *Peltigera*; **lacustris** (Arnold) Orange: on *Ionaspis lacustris*; **lecanorae** (Stein) Nik.Hoffm. & Hafellner: on *Myriolecis*; **lithoicaceae** (B. de Lesd.) Hafellner & V.John: on *Verrucaria*; **macrosporus** Alstrup & Olech: on *Protopannaria*; **martinianus** (Arnold) Triebel & Grube: on *Porpidia*; **melanohaleae** Etayo & van den Boom: on *Melanohalea exasperata*; **namibiensis** Diederich & M.Schultz: on *Psorotichia*; **peltigerae** Miädl. & Alstrup: on *Peltigera*; **physciicola** Alstrup: on *Physcia caesia*; **polischukii** Darmostuk & Khodos.: on *Bacidia*; **rolfii** (Etayo) Etayo: on *Candelina*; **sipmanii** Diederich & Zhurb.: on *Phaeorrhiza sareptana*; **socialis** (Körb.) Cl.Roux [= *Z. immersae* (Arnold) Grube & Triebel]: on *Clauzadea*, perhaps also on *Bacidia bagliettoana*; **solenosporae** van den Boom: on *Solenospora holophaea*; **sphinctriniformis** Grube & Hafellner: on *Romjularia lurida*; **sphinctrinoides** (Zwackh) Grube & Hafellner: on *Lecanora campestris*; **sulcatus** Pérez-Ortega & Etayo: on *Austroparmelina macrospora*; **turcicus** Kocakaya, Halıcı & Aksoy: on *Physcia magnussonii*.
Lit.: Alstrup 1993a; Alstrup & Olech 1993; Aptroot et al. 1997; Diederich & Zhurbenko 2009; Etayo 2010b; Grube & Hafellner 1990; Halıcı & Candan 2009; Harris 1995; Hawksworth & Atienza 1994; Hawksworth & Iturriaga 2006; Hawksworth & Miädlkowska 1997a; Hoffmann & Hafellner 2000; Kocakaya et al. 2011; Khodosovtsev & Darmostuk 2017; Kondratyuk 1996b; Miädlkowska & Alstrup 1995; Orange 2002; Pérez-Ortega et al. 2011a; Roux 2014; van den Boom 2010; van den Boom & Etayo 2014.

Order Dothideales Lindau

Family Dothideaceae Chevall.

Plowrightia Sacc.; type: *P. ribesia* (Pers.) Sacc. Mol.: yes.
Species: 1-0-0 (50). **mereschowskyi** Vouaux: on *Aspicilia hispida* [a poorly known species].
Lit.: Clauzade et al. 1989.

Family Saccotheciaceae Bonord.

Pseudoseptoria Spæg.; type: *P. donacicola* Spæg. Mol.: yes.
Species: 1-0-0 (8). **usneae** (Vouaux) D.Hawksw.: on *Usnea*.
Lit.: Hawksworth 1981.

Order **Lichenotheliales** K.Knudsen, Muggia & K.D.Hyde

Family **Lichenotheliaceae** Henssen

Lichenothelia D.Hawksw.; type: *L. scopularia* (Nyl.) D.Hawksw. (saxicolous, non-lichenized). Mol.: yes (L).
Species: 3-0-3 (30). **convexa** Henssen: over siliceous rocks, facultatively lichenicolous; **renobalesiana** D.Hawksw. & V.Atiensa: on endolithic Verrucariaceae (*Bagliettoa*, *Thelidium*, *Verrucaria*) over calcareous rocks; **rugosa** (G.Thor) Ertz & Diederich [= *Lichenostigma rugosum* G.Thor, as 'rugosa']: on *Diploschistes*; **scopularia** (Nyl.) D.Hawksw.: over siliceous rocks, facultatively lichenicolous; **spiralispóra** Etayo [as 'spiratispora']: on *Acarospora sphaerospora*; **umbrophila** Muggia, Kocourk. & K.Knudsen: over rocks, facultatively lichenicolous.
Lit.: Atienza & Hawksworth 2008; Etayo 2010c; Ertz et al. 2014b; Kocourková & Knudsen 2011b; Muggia et al. 2015b.

Lichenostigma Hafellner s.l. [incl. *Lichenostigma* subgen. *Lichenogramma* Nav.-Ros. & Hafellner; type: *L. elongatum*; see under *Lichenostigmatales* for *Lichenostigma* s.str.]. Mol.: yes (L). All species treated here have been described in *Lichenostigma*, but certainly do not belong there. They obviously belong to Lichenotheliaceae (*L.* cf. *elongatum* and several unidentified specimens have been sequenced by Ertz et al. 2014), but the generic affinities are yet unknown.

Species: 25-0-1. **amplum** Calat. & Hafellner: on *Buellia*; **anatolicum** Halıcı & Kocakaya: on brown *Acarospora*; **bolacinae** Nav.-Ros., Calat. & Hafellner: on *Polycauliona bolacina*; **canariense** Etayo & van den Boom: on *Aspicilia calcarea*; **cosmopolites** Hafellner & Calat.: on *Xanthoparmelia*; **dimelaenae** Calat. & Hafellner: on *Dimelaena oreina*; **diploiciae** Calat., Nav.-Ros. & Hafellner: on *Diploicia subcanescens*; **elongatum** Nav.-Ros. & Hafellner [as 'elongata']: on *Aspicilia* and *Lobothallia*; **epipolinum** Nav.-Ros., Calat. & Hafellner [as 'epipolina']: on *Diploleptotomma epipolinum*; **epiorpidiae** S.Y.Kondr., L.Lökös & J.-S.Hur: on *Porpidia*; **epirupestre** Pérez-Ortega & Calat.: on *Pertusaria pertusa*; **episulphurella** Etayo & van den Boom: on *Lecanora sulphurella*; **gracile** Calat., Nav.-Ros. & Hafellner: on *Acarospora fuscata*; **heterodermiae** S.Y.Kondr., L.Lökös et J.-S.Hur: on *Heterodermia*; **iranicum** Brackel & Valadbeigi: on *Lobothallia praeradiosa*; **lecanorae** Calat. & Nav.-Ros.: on *Lecanora farinacea*; **radicans** Calat. & Barreno: on *Aspicilia*; **rouxii** Nav.-Ros., Calat. & Hafellner: on *Squamarina*; **rupicolae** Fern.-Brime & Nav.-Ros.: on *Pertusaria rupicola*; **saxicola** K.Knudsen & Kocourk.: saxicolous, facultatively lichenicolous on *Polysporina simplex*; **semi-immersum** Hafellner: on *Buellia*; **subradians** Hafellner, Calat. & Nav.-Ros.: on *Acarospora*; **supertegentis** Ihlen & R.Sant.: on *Aspicilia supertegens*; **svandae** Vondrák & Šoun: on *Acarospora cervina*; **triseptatum** Halıcı & D.Hawksw.: on *Aspicilia*; **verrucosum** Brackel & Valadbeigi: on *Pleopsidium gobiense*.

Lit.: Alstrup & Hawksworth 1990; Calatayud & Barreno 2003; Calatayud & Navarro-Rosinés 2000; Calatayud et al. 2002, 2004b; Etayo & Sancho 2008; Fernández-Brime et al. 2010; Hafellner 1982a, 1999, Hafellner & Calatayud 1999; Halıcı & Hawksworth 2007; Halıcı et al. 2009d; Harris & Lendemer 2009; Ihlen 2004; Kondratyuk et al. 2013, 2017; Knudsen & Kocourková 2010b; Navarro-Rosinés & Hafellner 1996; Pérez-

Ortega & Calatayud 2009; Thor 1985; van den Boom & Etayo 2006; Valadbeigi & Brackel 2011; Vondrák & Šoun 2007.

Order **Patellariales** D.Hawksw. & O.E.Erikss.

Family **Patellariaceae** Corda

Stratisporella Hafellner; type: *S. episemoides*. Mol.: no.
Species: 1-0-0. **episemoides** (Nyl.) Hafellner: on *Enterographa*.
Lit.: Aptroot et al. 1997; Hafellner 1979; Kutorga & Hawksworth 1997.

Tryblidaria (Sacc.) Rehm; type: *T. fenestrata* (Cooke & Peck) M.E.Barr. Mol.: no. The lichenicolous species is poorly known.
Species: 1-0-0 (9). **capensis** (Stizenb.) Vouaux: on *Buellia callaina*.
Lit.: Clauzade et al. 1989.

Order **Pleosporales** M.E.Barr.

Family **Dacampiaceae** Körb.

Dacampia A.Massal.; type: *D. hookeri*. Mol.: yes (T).
Species: 14-1-0. **caloplacicola** Halıcı, Candan & Etayo: on *Blastenia crenularia*; **cladoniicola** Halıcı & A.Ö.Türk: on *Cladonia*; **cyrtellae** Brackel: on *Lecania cyrtella*; **engeliana** (Saut.) A.Massal.: on *Solorina*; **hookeri** (Borrer) A.Massal.: lichenicolous lichen on *Solorina*; **lecaniae** Kocourk. & K.Knudsen: on *Lecania fuscella*; **leptogiicola** (D.Hawksw.) D.Hawksw.: on *Leptogium*; **muralicola** Halıcı & D.Hawksw.: on *Protoparmeliopsis muralis*; **peltigericola** D.Hawksw. & C.J.B.Hitch: on *Peltigera*; **pentaseptata** Etayo: on *Parmotrema*; **rhizocarpicola** D.Hawksw.: on *Rhizocarpon*; **rubra** Halıcı, Candan & Calat.: on *Aspicilia*; **rufescentis** (Vouaux) D.Hawksw.: on *Peltigera*; **thamnoliicola** Zhurb. *ad int.*: on *Thamnolia*; **xanthomendozae** Etayo & Halıcı: on *Xanthomendoza*.
Lit.: Brackel 2010a, 2010b; Earland-Bennett et al. 2006; Ertz et al. 2015; Etayo 2017; Halıcı & Hawksworth 2008; Halıcı et al. 2008, 2009a, 2009b; Hawksworth 1980b, 1986; Henssen 1995; Khodosovtsev & Darmostuk 2016; Kocourková & Knudsen 2010b; Zhurbenko 2012.

Family **Didymellaceae** Gruyter

Ascochyta Lib.; type: *A. pisi* Lib. Mol.: yes (T).
Species: 2-0-0 (400). **candelariellicola** D.Hawksw. & Kalb: on *Candelariella aurella*; **santessonii** Alstrup & D.Hawksw.: on *Phaeophyscia sciastra*.
Lit.: Alstrup & Hawksworth 1990; Hawksworth & Kalb 1992.

Epicoccum Link; type: *E. nigrum*. Mol.: yes (T, L).
Species: 0-0-1 (10). **nigrum** Link: facultatively lichenicolous over various lichens.
Lit.: David & Hawksworth 1995; Diederich 2004b.

Leptosphaerulina McAlpine; type: *L. australis* McAlpine. Mol.: yes (T).

Species: 1-0-0 (30). **peltigerae** (Fuckel) Riedl: on *Peltigera*. Lit.: Hawksworth 1980b.

Phoma Sacc. s.l.; type: *P. herbarum* Westend. Mol.: yes (T). Asexual, pycnidial. Most lichenicolous *Phoma* species from which molecular data are available belong to *Didymocyrtis* (Phaeosphaeriaceae, Pleosporales), and some more pertain to that genus on the basis of morphological characters. The remaining species, of unknown phylogenetic affinities, are enumerated here.

Species: 10-0-0 (100). **aggregata** Calat. & Etayo: on *Diploschistes ocellatus*; **biformis** Vouaux: on *Anisomeridium biforme* [a poorly known taxon]; **dubia** (Linds.) Sacc. & A.Trotter: on *Usnea*; **everniae** D.Hawksw.: on *Evernia prunastri*; **fistulata** Etayo & Osorio: on *Parmotrema fistulatum* [does not belong to *Didymocyrtis*]; **lecanorina** Diederich: on *Lecanora*; **maculiformans** Ihlen: on *Dibaeis baeomyces*; **melanohaleicola** D.Hawksw. & Earl.-Benn.: on *Melanohalea exasperata*; **pisutii** S.Y.Kondr., A.Lackovičová, E.Lisická & A.Gutková: on *Xanthomendoza ulophylloides*; **receptii** Halıcı & Candan: on *Caloplaca* s.str.

Lit.: Brackel 2011a; Calatayud & Etayo 2001; Diederich 1986; Earland-Bennett et al. 2006; Etayo & Osorio (2004); Hafellner & Wieser 2000; Halıcı et al. 2014; Hawksworth 1980b, 1981, 1994; Ihlen 1998; Martínez & Hafellner 1998; Oksner 2010.

Family Didymosphaeriaceae Munk

Sporidesmiella P.M.Kirk; type: *S. claviformis* P.M.Kirk. Mol.: yes. Asexual, hyphomycetous.

Species: 2-0-0 (32). **lichenophila** U.Braun & Heuchert: on *Ramalina stenospora*; **physconiicola** Zhurb., U.Braun & Kobzeva: on *Physconia distorta*.

Lit.: Braun & Heuchert 2010; Zhurbenko et al. 2015d.

Family Leptosphaeriaceae M.E.Barr

Leptosphaeria Ces. & De Not.; *L. doliolum* (Pers.) Ces. & De Not. Mol.: yes (T).

Species: 3-0-0 (150). **clarkii** D.Hawksw.: on *Peltigera*; **oxneriae** Cl.Roux & S.Y.Kondr.: on *Xanthomendoza ulophylloides*; **pycnostigma** (Nyl.) Sacc. & D.Sacc.: on *Baeomyces*. Lit.: Clauzade et al. 1989; Hawksworth 1980b; Kondratyuk et al. 2017.

Family Massarinaceae Munk

Stagonospora (Sacc.) Sacc.; type: *S. paludosa* (Sacc. & Speg.) Sacc. Mol.: yes (T). Asexual, pycnidial.

Species: 1-0-0 (220). **exasperatulae** Brackel: on *Melanohalea exasperatula*.

Lit.: Brackel 2009.

Family Microsphaeropsidaceae Q.Chen, L.Cai & Crous

Microsphaeropsis Höhn.; type: *M. olivacea* (Bonord.) Höhn. Mol.: yes (T).

Species: 3-0-0 (37). **caloplacae** Etayo & Yazici: on *Calogaya*; **lichenicola** Etayo: on *Pannaria*; **physciae** Brackel: on *Physcia*.

Lit.: Brackel 2014; Etayo & Sancho 2008; Etayo & Yazici 2009.

Family Periconiaceae Nann.

Periconia Tode; type: *P. lichenoides* Tode. Mol.: yes (L). Asexual, hyphomycetous.

Species: 0-0-1 (45). **digitata** (Cooke) Sacc.: facultatively lichenicolous on *Cladonia*, *Peltigera* and *Xanthoria parietina*.

Lit.: Brackel 2014.

Family Phaeosphaeriaceae M.E.Barr

Didymocyrtis Vain.; type: *D. consimilis* (lectotypification by Ertz et al. 2015) [= *Diederichia* D.Hawksw.; type: *D. pseudeverniae*; = *Diederichomyces* Crous & Trakunyingcharoen; type: *D. xanthomendozae*]. Mol.: yes (T). Several *Phoma* and one *Leptosphaeria* species obviously belong here, but no new combinations are proposed for some, as they might represent synonyms of other species.

Species: 25-0-0 (26). **bryonthae** (Arnold) Hafellner [= *Phoma denigricans* Hafellner]: on *Lecanora epibryon*; **canariensis** van den Boom & Etayo: on *Ramalina subgeniculata*; **Phoma candelariellae** Z.Kocakaya & Halıcı: on *Candelariella aurella* [similar to *D. consimilis*]; **cladonicicola** (Diederich, Kocourk. & Etayo) Ertz & Diederich [= *Ph. cladonicicola* Diederich, Kocourk. & Etayo]: on *Cladonia*, *Flavoparmelia*, *Parmelina*, *Ramalina* and *Squamarina*; **consimilis** Vain. [= *Ph. caloplacae* D.Hawksw.]: on *Caloplaca* s.str., possibly also on *Cladonia*, *Heterodermia* and *Melanohalea*; **epiphyscia** Ertz & Diederich [= *Ph. physciicola* Keissler; =? *Ph. epiphyscia* Vouaux, described from *Xanthoria* and *Phaeophyscia*, neotype on *Phaeophyscia sciastra*]: on *Physcia aipolia*, probably also on *Physcia adscendens*, *P. stellaris*, *P. tenella* and *Xanthoria parietina*; **foliaceiphila** (Diederich, Kocourk. & Etayo) Ertz & Diederich [= *Ph. foliaceiphila* Diederich, Kocourk. & Etayo]: on *Cladonia*, *Parmelia* and *Pseudevernia*; **Phoma fuliginosa** M.S.Cole & D.Hawksw.: on *Xanthomendoza trachyphylla* [similar to *D. consimilis*]; **graphidacearum** van den Boom & Ertz: on *Pallidogramme*; **grumantiana** (Zhurb. & Diederich) Zhurb. & Diederich, comb. nov. [= *Ph. grumantiana* Zhurb. & Diederich]: on *Cladonia*; **Phoma heterodermiae** S.Y.Kondr., L.Lókös & J.-S.Hur: on *Heterodermia* [similar to *D. consimilis*]; **infestans** (Speg.) Hafellner: on *Teloschistes chrysophthalmus* and *T. flavicans*; **kaernefeltii** (S.Y.Kondr.) Hafellner [= *Polycoccum kaernefeltii* S.Y.Kondr.]: on *Teloschistes chrysophthalmus*; **melanelixiae** (Brackel) Diederich, Harris & Etayo [= *Ph. melanelixiae* Brackel]: on *Canoparmelia*, *Cetraria*, *Parmelia*, *Evernia*, *Hypotrachyna*, *Melanelixia*, *Parmelia*, *Parmotrema*, *Platismatia*, *Pseudevernia*, *Punctelia* and *Usnea*; **micropunctum** Etayo: on *Parmotrema*; **Phoma peltigerae** (P.Karst.) D.Hawksw.: on *Peltigera*; **Leptosphaeria protousneae** Etayo: on *Protousnea* [similar to *D. ramalinae*]; **physciae** (Brackel) Hafellner [= *Merismatium physciae* Brackel; = *Pleospora physciae* (Brackel) Hafellner & E.Zimm.]: on *Physcia*; **pseudeverniae** (Etayo & Diederich) Ertz & Diederich [= *Diederichia pseudeverniae* (Etayo & Diederich) D.Hawksw.; = *Macrophomina pseudeverniae* Etayo & Diederich]: on *Pseudevernia*; **ramalinae** (Desm.) Ertz, Diederich & Hafellner

[= *Ph. ficuzzae* Brackel; =? *Pyrenidium ucrainicum* S.Y.Kondr., L.Lökös & J.-S.Hur]: on *Ramalina*; **Phoma rozziana** Etayo: on *Pseudocyphellaria* [similar to *D. cladoniicola*]; **slaptioniensis** (D.Hawksw.) Hafellner & Ertz [= *Polycoccum slaptioniense* D.Hawksw.]: on *Xanthoria parietina*; **trassii** Suija, Darmostuk & Khodos.: on *Cetraria aculeata*; **xanthomendozae** (Diederich & Freebury) Diederich & Freebury [= *Diederichomyces xanthomendozae* (Diederich & Freebury) Crous & Trakunyingcharoen; = *Ph. xanthomendozae* Diederich & Freebury]: on *Xanthomendoza*; **Phoma thammoliae** Zhurb. ad int.: on *Thammolia*.

Lit.: Brackel 2008, 2010a; Diederich et al. 2007; Etayo 1996, 2017; Etayo & Diederich 1996a; Etayo & Sancho 2008; Hafellner 1994a, 2015; Hafellner & Zimmermann 2012; Hawksworth 1981, 1994, 2003; Hawksworth & Cole 2004; Khodosovtsev et al. 2018; Kocakaya et al. 2015; Kondratyuk 2008; Kondratyuk et al. 2012, 2013; Lawrey et al. 2012; van den Boom et al. 2017; Zhurbenko 2012.

Ophiobolus Riess; type: *O. disseminans* Riess. Mol.: yes (T).

Both lichenicolous species probably do not belong here. Species: 2-0-0 (350). **aspiciliae** (H.Olivier) Vouaux: on *Aspicilia*; **thallicola** (Ces. & De Not.) Sacc.: on *Peltigera* [often considered a synonym of *Neolamya peltigerae*, but following Brackel 2014 possibly a distinct species].

Lit.: Brackel 2014; Clauzade et al. 1989.

Phaeoseptoria Speg.; type: *P. papayae* Speg. [= *Phaeosphaeria* I.Miyake; type: *P. orizae* I.Miyake]. Mol.: yes (T).

Species: 1-0-0 (90). **peltigerae** Punith. & Spooner: on *Peltigera*.

Lit.: Punithalingam & Spooner 1997.

Xenophoma Crous & Trakunyingcharoen; type: *X. puncteliae*. Mol.: yes (T, L).

Species: 1-0-0. **puncteliae** (Diederich & Lawrey) Crous & Trakunyingcharoen [= *Phoma puncteliae* Diederich & Lawrey]: on *Punctelia*.

Lit.: Lawrey et al. 2012; Trakunyingcharoen et al. 2014.

Family Pleomassariaceae M.E.Barr

Lichenopyrenis Calat., Sanz & Aptroot; type *L. galligena*. Mol.: no.

Species: 1-0-0. **galligena** Calat., Sanz & Aptroot: on *Leptochidium albociliatum*.

Lit.: Calatayud et al. 2001b.

Family Pleosporaceae Nitschke

Pleospora Ces. & De Not.; type: *P. herbarum* (Pers.) Ces. & De Not. Mol.: yes (T).

Species: 6-0-0 (65). **bernadetiae** van den Boom [as *Plaeospora bernadetae*]: on *Protoparmeliopsis muralis*; **collematum** Zukul: on Collemataceae; **Verrucaria congestula** Cromb.: on *Aspiciliopsis macrophthalma* [a taxon of uncertain position, provisionally placed here]; **crozalsii** Vouaux: on *Sticta sylvatica*; **treiachii** Hafellner [= *P. aquatica* Treiach & Nimis, non Griffiths]: on *Aspicilia*; **xanthoriae** Khodos. & Darmostuk: on *Xanthoria parietina*. Lit.: Clauzade et al. 1989; Khodosovtsev & Darmostuk 2016; Treiach & Nimis 1999; van den Boom 2015.

Family Pyrenochaetopsidaceae Valenzuela-López, Crous, Cano, Guarro & Stchigel

Pyrenochaetopsis Gruyter; type: *P. leptospora* (Sacc. & Briard) Gruyter. Mol.: yes (T, L).

Species: 0-0-1 (7). **microspora** (Gruyter & Boerema) Gruyter, Aveskamp & Verkley: facultatively lichenicolous on *Buellia*.

Lit.: de Gruyter et al. 2010.

Family Sporormiaceae Munk

Preussia Fuckel [a hemihomonym of *Preussia* Karsch, Orthoptera]; type: *P. funiculata* (Preuss) Fuckel [= *Sporormiella* Ellis & Everh.; type: *S. nigropurpurea* Ellis & Everh.]. Mol.: yes (T).

Species: 1-0-0 (50). **peltigerae** (Brackel) Diederich, comb. nov. [= *Sporormiella peltigerae* Brackel]: on *Peltigera rufescens*.

Lit.: Brackel 2009.

Family Trematosphaeriaceae K.D.Hyde, Y.Zhang, Suetrong & E.B.G.Jones

Trematosphaeria Fuckel; type: *T. pertusa* (Pers.) Fuckel. Mol.: yes (T).

Species: 1-0-0 (20). **lophiostoma** M.Choisy & Werner: on *Staurothele* [a poorly known species].

Lit.: Clauzade et al. 1989.

Order Pleosporales genera incertae sedis

Berkleasmium Zobel; type: *B. cordeanum* Zobel. Mol.: yes.

Species: 1-0-0 (36). **parmeliellae** Etayo & Diederich: on *Parmeliella testacea*.

Lit.: Etayo & Diederich 1995.

Ellisemia Subram.; type: *E. coronata* (Fuckel) Subram. Mol.: yes.

Species: 1-0-0 (60). **lichenicola** Heuchert & U.Braun: on various lichens.

Lit.: Heuchert & Braun 2006.

Pseudopyrenidium Nav.-Ros., Zhurb. & Cl.Roux; type: *P. tartaricola*. Mol.: no.

Species: 1-0-0. **tartaricola** (Linds.) Nav.-Ros., Zhurb. & Cl.Roux [= *Weddellomyces tartaricola* (Linds.) Alstrup & D.Hawksw.]: on *Ochrolechia*.

Lit.: Alstrup & Hawksworth 1990; Navarro-Rosinés et al. 2010.

Pyrenochaeta De Not.; type: *P. nobilis* De Not. Mol.: yes (T).

Species: 2-0-0 (5). **collematis** Vouaux: on *Enchylium tenax* [not a *Pyrenochaeta*, fide Roux 2014]; **xanthoriae** Diederich: on *Xanthoria*.

Lit.: Clauzade et al. 1989; Diederich 1990; Hafellner 1982a.

Order Strigulales Lücking, M.P.Nelsen & K.D.Hyde

Family Strigulaceae Zahlbr.

Strigula Fr.; type: *S. smaragdula* Fr. (lichenized). Mol.: yes (T).

Species: 1-0-0 (70). **dichosporidii** Etayo: on *Dichosporidium nigrocinctum*.

Lit.: Etayo 2002.

Order **Trypetheliales** Lücking, Aptroot & SipmanFamily **Polycoccaceae** Ertz, Hafellner & Diederich

Clypeococcum D.Hawksw.; type: *C. cladonema*. Mol.: yes (L).

Species: 12-0-0. **amylaceum** Etayo: on *Parmotrema*; **bisporum** Zhurb.: on *Cetraria* and *Nephromopsis*; **cajasense** Etayo: on *Hypotrachyna*; **cetrariae** Hafellner: on *Cetraria* and *Nephromopsis*; **cladonema** (Wedd.) D.Hawksw.: on *Cetrelia* and *Xanthoparmelia*; **epimelanostolum** (D.Hawksw. & Øvstedal) Grube & Hafellner: on *Buellia melanostola*; **galloides** Etayo: on *Lecidea* s.l.; **grossum** (Körb.) D.Hawksw.: on *Umbilicaria*; **hypocenomyces** D.Hawksw.: on *Hypocenomyce*; **placopsiophilum** Øvstedal & D.Hawksw.: on *Placopsis*; **psoromatis** (A.Massal.) Etayo [= *C. epicrassum* (H.Olivier) Hafellner & Nav.-Ros.]: on *Squamarina*; **rugosporum** Etayo & Zhurb.: on *Parmotrema*.

Lit.: Ertz et al. 2015; Etayo 2010b, 2017; Etayo & Triebel 2010; Grube & Hafellner 1990; Hafellner 1994a, 1995a; Hawksworth 1977a, 1980a, 1982a; Navarro-Rosinés et al. 1994; Øvstedal & Hawksworth 1986; Zhurbenko 2009a; Zhurbenko et al. 2016.

Polycoccum Körb.; type: *P. sauteri*, i.e. *P. trypethelioides*. Mol.: yes (T, L).

Species: 60-0-0. **acarosporicola** Halıcı & D.Hawksw.: on *Acarospora cervina*; **aksoyi** Halıcı & V.Atiienza: on *Aspicilia*; **alboatrae** (Vouaux) Etayo: on *Diplotomma venustum*; **amygdalariae** F.Berger & Triebel: on *Amygdalaria*; **anatolicum** Halıcı & E.Akgül: on *Lepraria incana*; **arnoldii** (Hepp) D.Hawksw.: on *Diploschistes* and *Rhizocarpon*; **atrostriatae** van den Boom: on *Physcia atrostriata*; **cartilagosum** (Arnold) D.Hawksw.: on an unidentified saxicolous lichen?; **cladoniae** Diederich & D.Hawksw.: on *Cladonia*; **clauderouxii** S.Y.Kondr., L.Lökös & J.-S.Hur: on *Zeroviella laxa*; **clauzadei** Nav.-Ros. & Cl.Roux: on *Rusavskia elegans*; **crassum** Vězda: on *Peltigera*; **crespoae** Váczi & D.Hawksw.: on *Xanthoparmelia*; **decolorans** Calat. & Triebel: on *Immersaria*; **deformans** R.Sant. & Brackel: on *Placopsis*; **dictyonematis** Etayo & R.Sant.: on *Cora*; **diederichianum** Nav.-Ros., nom. inval. (Art. 30.8): on *Placynthium*; **dzieduszyckii** (Boberski) D.Hawksw.: on *Bagliettoa*; **epiphyllum** Matzer: on foliicolous *Trichothelium*; **epizoharyi** Calat. & V.Atiienza: on *Buellia zoharyi*; **evae** Calat. & V.J.Rico: on *Dimelaena*; **follmannii** (C.W.Dodge) Alstrup: on *Lecidea cremoricolor*; **heterodermiae** Calat.: on *Heterodermia*; **hymeniicola** (Berk. & Broome) Zhurb. [= *Endococcus hymeniicola* (Berk. & Broome) D.Hawksw.]: on *Lobaria* [generic position uncertain]; **ibericum** Etayo & van den Boom: on *Rinodina*; **innatum** (Müll.Arg.) D.Hawksw.: on an unidentified corticolous lichen; **islandicum** Brackel & F.Berger: on *Placopsis gelida*; **jamesii** D.Hawksw.: on *Psoromidium*; **kernerii** J.Steiner: on *Lecidea fuscoatra*; **laursenii** Zhurb.: on *Cladonia*; **longisporum** Etayo: on *Pseudocyphellaria*; **marmoratum** (Kremp.) D.Hawksw.: on crustose lichens on calcareous rocks (*Clauzadea*, *Polyblastia*, *Thelidium*, *Verrucaria*); **microcarpum** Diederich & Etayo: on *Cladonia*; **microstictum** (Leight.) Arnold: on *Acarospora*, also reported from *Buellia*, *Ionaspis* and *Rhizocarpon*; **minutulum** Kocourk. & F.Berger: on *Trapelia placodioides*; **montis-wilhelmii** Diederich: on *Hypotrachyna*; **nigrosporum** Etayo: on *Buellia aethalea*; **ochvarianum** Y.Joshi: on *Ochrolechia*,

Pertusaria and *Varicellaria*; **opulentum** (Th.Fr. & Almq.) Arnold: on *Polyblastia*; **peltigerae** (Fuckel) Vězda: on *Peltigera*; **perrugosae** Brackel: on *Placopsis perrugosa*; **psorae** Zhurb. & Triebel: on *Anamylopsora pulcherrima*; **pulvinatum** (Eitner) R.Sant.: on *Physcia*; **rinodinae** van den Boom: on *Rinodina*; **rubellianae** Calat. & V.Atiienza: on *Caloplaca rubelliana*; **rugulosarium** (Linds.) D.Hawksw.: on *Austroplaca cirrochrooides* and *Gondwania*; **serusiauxii** Matzer: on foliicolous *Byssolecania*; **sporastatae** Arnold: on *Sporastatia*; **squamarioides** (Mudd) Arnold: on *Placopsis*; **stellulatae** (Vouaux) Hafellner: on *Buellia stellulata*; **stictaria** (Linds.) D.J.Galloway: on *Pseudocyphellaria*; **superficiale** D.Hawksw. & Miądl.: on *Peltigera*; **teresum** Halıcı & K.Knudsen: on *Xanthoria*; **thallicola** Arnold: on cf. *Aspicilia candida*; **tinantii** Diederich: on *Blastenia ferruginea*; **trypethelioides** (Th.Fr.) R.Sant. [= *P. sauteri* Körb., fide Santesson 1960]: on *Stereocaulon*; **umbilicariae** (Linds.) D.Hawksw.: on *Lasallia*; **ventosicola** Zhurb.: on *Ophioparma ventosa*; **vermicularium** (Linds.) D.Hawksw.: on *Thamnomlia*; **versisporum** (Bagl. & Carestia) D.Hawksw.: on *Rhizocarpon geographicum* and an unidentified saxicolous lichen.

Lit.: Alstrup 2002; Aptroot et al. 1997; Atienza & Hawksworth 2008; Atienza et al. 2003; Berger 2000; Brackel & Berger 2010; Calatayud 2004; Calatayud & Atienza 2000; Calatayud & Rambold 1998; Calatayud & Rico 1995; Clauzade et al. 1989; Diederich 1990; Ertz et al. 2015; Etayo 2010b, 2010c; Etayo & Diederich 1998; Etayo & Sancho 2008; Galloway 2004; Gaya & Navarro-Rosinés 2008; Hafellner 2015; Halıcı et al. 2007a, 2009c, 2013; Hawksworth 1985b; Hawksworth & Diederich 1988; Hawksworth & Miądlkowska 1997a; Joshi et al. 2017a; Kocourková & Berger 1999; Kondratyuk et al. 2016b; Lord et al. 2013; Matzer 1996; Navarro-Rosinés 1992; Navarro-Rosinés & Roux 1990, 1998; Triebel 1989; Váczi & Hawksworth 2001; van den Boom 2010, 2012; van den Boom & Etayo 2014; Zhurbenko 2007b, 2010b; Zhurbenko & Dillman 2010.

Order **Tubeufiales** Boonmee & K.D.HydeFamily **Tubeufiaceae** M.E.Barr

Lichenotubeufia Etayo; type: *L. eriodermiae*. Mol.: no.

Species: 5-0-0. **boomiana** Etayo: on *Sticta*; **eriodermiae** (Etayo) Etayo: on *Erioderma*; **heterodermiae** (Etayo) Etayo: on *Heterodermia* and *Physcia*; **pannariae** (Etayo) Etayo: on *Pannaria rubiginosa*; **tafallae** Etayo: on *Leptogium*.

Lit.: Etayo 2002a, 2002b, 2017.

Order **Venturiales** Yin.Zhang & K.D.HydeFamily **Venturiaceae** M.E.Barr.

Spilodochium Syd.; type: *S. vernoniae* Syd. Mol.: no. Asexual, sporodochial.

Species: 1-0-0 (4). **parmotrematis** Diederich & Etayo: on *Parmotrema*.

Lit.: Etayo & Diederich 1995.

Order **Venturiales** genus incertae sedis

Fusicladium Bonord.; type: *F. virescens* Bonord. (saprotrophic). Mol.: yes (L).

Species: 0-0-1 (75). **peltigericola** Crous & Diederich: isolated from *Peltigera*, probably lichenicolous.
Lit.: Crous et al. 2011.

Class Dothideomycetes familiae incertae sedis

Family Corynesporascaceae Sivan.

Corynespora Güssow; type: *C. mazei* Güssow. Mol.: yes. Asexual, hyphomycetous.
Species: 2-0-0 (130). **laevistipitata** (M.S.Cole & D.Hawksw.) Heuchert & U.Braun [= *Taeniolella laevistipitata* M.S.Cole & D.Hawksw.]: on *Graphis*, *Lecanora*, *Lepra*, *Pertusaria*, *Phaeophyscia* and *Xanthoria*; **thorii** U.Braun, Zhurb. & Frisch: on *Lecanora*.
Lit.: Heuchert & Braun 2006; Zhurbenko et al. 2015d.

Family Naetrocymbaceae R.C.Harris

Leptorhaphis Körb.; type: *L. oxyspora* (Nyl.) Körb. Mol.: no.
Species: 1-0-0 (15). **haematommata** Hafellner & Kalb: on *Haematomma*.
Lit.: Kalb et al. 1995.

Family Pseudoperisporiaceae Toro

Keratosphaera H.P.B.Upadhyay; type: *K. batistae* [= *Sporhaplus* H.B.P.Upadhyay; type: *S. rondoniensis*, i.e. *K. batistae*; = *Sphaeromma* H.B.P.Upadhyay; type: *S. mazosiae*, i.e. *K. batistae*]. Mol.: no.
Species: 5-0-0 (6). **antoniana** Flakus, Farkas & Lücking: on foliicolous *Trichothelium*; **batistae** H.B.P.Upadhyay [= *Sphaeromma mazosiae* H.B.P.Upadhyay; = *Sporhaplus rondoniensis* H.B.P.Upadhyay]: on foliicolous *Mazosia*; **dimerellae** Matzer: on foliicolous *Coenogonium*; **furcatisetata** Matzer [= *Sphaeromma furcatisetata* Matzer]: on foliicolous *Porina*; **porinae** Matzer [= *Sphaeromma porinae* Matzer]: on foliicolous *Porina*.
Lit.: Farkas 2010; Matzer 1996.

Myxophora Döbbeler & Poelt; type: *M. amerospora* Döbbeler & Poelt. Mol.: no.
Species: 5-0-0 (7). **apotheciicola** Nik.Hoffm. & Hafellner: on *Leptogium azureum*; **leptogiophila** (G.Winter) Nik.Hoffm. & Hafellner: on *Collema* and *Scytinium plicatile*; **ovalispora** Nik.Hoffm. & Hafellner: on *Collema*; **placynthii** Nik.Hoffm. & Hafellner: on *Placynthium caesium*; **tetraspora** Nik.Hoffm. & Hafellner: on *Collema flaccidum*.
Lit.: Hoffmann & Hafellner 2000.

Neocoleroa Petr.; type: *N. sibirica* Petr. Mol.: no.
Species: 3-0-0 (6). **inundata** (Vain.) Diederich: on *Bacidina*; **lichenicola** (Hansf.) M.E.Barr. subsp. **lichenicola** [= *Wentomyces lichenicola* (Hansf.) D.Hawksw.]: on foliicolous lichens; **lichenicola** subsp. **bouteillei** (Bricaud, Cl.Roux & Sérus.) Barr: on *Fellhanera bouteillei*, *Byssoloma* and possibly *Bacidina*.
Lit.: Barr 1997; Hawksworth 1980b; Matzer 1996; Roux et al. 1994; Sérusiaux et al. 1999.

Family Trichothyriaceae Theiss.

Lichenopeltella Höhn.; type: *L. maculans* [= *Micropeltopsis* Vain.; type: *M. cetrariicola*; = *Microthyris* Clem.; type: *M. maculans*; = *Trichothyrina* (Petr.) Petr.; type: *T. alpestris* (Sacc.) Petr.]. Mol.: no.
Species: 39-0-0 (48). **arctomiae** Pérez-Ortega & T.Sprib.: on *Arctomia delicatula*; **biatorae** Pérez-Ortega & T.Sprib.: on *Biatora flavopunctata*; **bunodophoronis** Diederich: on *Bunodophoron*; **cetrariae** (Bres.) Höhn.: on *Cetraria*; **cetrariicola** (Nyl.) R.Sant. [= *Micropeltopsis cetrariicola* (Nyl.) Vain.]: on *Cetraria*; **cladoniarum** E.S.Hansen & Alstrup: on *Cladonia* subgen. *Cladina*; **communis** Etayo: on *Hypotrachyna*; **coppinsii** Earl.-Benn. & D.Hawksw.: on *Verrucaria*; **epiphylla** R.Sant.: on foliicolous *Mazosia* and *Porina*; **heppiae** van den Boom: on *Heppia*; **heterodermae** Diederich: on *Heteroderma*; **heterodermiicola** M.S.Cole & D.Hawksw. subsp. **heterodermiicola**: on *Heteroderma*; **heterodermiicola** subsp. **endothallina** Etayo: on *Heteroderma*; **hydrophila** R.Sant.: on *Verrucaria*; **hypogymniae** Diederich: on *Hypogymnia zeylanica*; **hypotrachynae** Diederich: on *Hypotrachyna*; **leprosulae** Pérez-Ortega & T.Sprib.: on *Myochroidea leprosula*; **leptogii** Diederich: on *Leptogium*; **lobariae** Etayo & Diederich: on *Lobaria*; **maculans** (Zopf) Höhn. [= *Microthyris maculans* (Zopf) Clem.]: on *Umbilicaria*; **megalosporae** Diederich: on *Megalospora*; **microspora** Diederich: on *Parmeliella*; **minuta** R.Sant.: on *Agonimia foliacea*; **pannariacearum** Diederich: on Pannariaceae; **peltigericola** (D.Hawksw.) R.Sant.: on *Peltigera*; **physciae** Diederich: on *Physcia*; **pseudocyphellariae** Diederich: on *Pseudocyphellaria*; **ramalinae** Etayo & Diederich: on *Ramalina*; **rangiferinae** Brackel: on *Cladonia*; **santessonii** (P.M.Kirk & Spooner) R.Sant.: on *Peltigera*; **sclerenchymatica** Etayo: on *Pseudocyphellaria*; **setifera** Matzer: on foliicolous *Bacidia*; **soiliae** Zhurb. & Pino-Bodas: on *Cladia*; **stereocaulorum** Zhurb.: on *Stereocaulon*; **swaminathaniana** Harih., Mibey & D.Hawksw.: on *Porina*; **thalamica** Etayo, Flakus & Kukwa: on *Pseudocyphellaria*; **thamnoliae** R.Sant.: on *Thamnolia*; **thelidii** Diederich: on *Thelidium*; **uncialicola** Brackel: on *Cladonia uncialis*.
Lit.: Aptroot et al. 1997; Brackel 2010c, 2011b; Cole & Hawksworth 2002; Earland-Bennett & Hawksworth 1999b; Etayo 2010b, 2017; Etayo & Diederich 1996b; Etayo & Sancho 2008; Hansen & Alstrup 1995; Hariharan et al. 1996; Matzer 1996; Molitor & Diederich 1997; Pérez-Ortega & Spribile 2009; Santesson 1988, 1989, 1998, 2001; van den Boom & Giral 2012; Zhurbenko 2010a; Zhurbenko & Pino-Bodas 2015.

Macrographa Etayo; type: *M. antarctica*. Mol.: no.
Species: 1-0-0. **antarctica** Etayo: on *Nephroma antarcticum*.
Lit.: Etayo & Sancho 2008.

Class Dothideomycetes genera incertae sedis

Ampullifera Deighton; type: *A. foliicola* [= *Ampulliferella* Bat. & Cavalc.; type: *A. amoeboides*; = *Ampulliferopsis* Bat. & Cavalc.; type: *A. myriapoda*, i.e. *A. amoeboides*; = *Teratoschaeta* Bat. & O.M.Fonseca; type: *T. rondoniensis*, i.e. *A. amoeboides*]. Mol.: no.
Species: 6-0-0. **amoeboides** (Bat. & Cavalc.) D.Hawksw. [= *Ampulliferella amoeboides* Bat. & Cavalc.; = *Ampulliferopsis myriapoda* Bat. & Cavalc.; = *Teratoschaeta rondoniensis* Bat. & O.M.Fonseca;]: on foliicolous *Mazosia* and other

Roccellaceae; **foliicola** Deight.: on foliicolous lichens; **hippocrateacearum** (Bat. & Caval.) D.Hawksw. [= *A. brasiliensis* Deight.]: on foliicolous *Mazosia* and other lichens; **leonensis** Deight.: on foliicolous lichens; **pirozynskii** D.Hawksw.: on foliicolous lichens; **ugandensis** Deight.: on foliicolous lichens.
Lit.: Hawksworth 1979; Matzer 1996.

Cercidospora Körb.; type: *C. ulothii*, i.e. *C. macrospora*. Mol.: no.

Species: 40-0-0 (100). **alpina** Ihlen & Wedin: on *Stereocaulon cumulatum*; **anomala** Etayo: on *Pertusaria pertusa*; **apiosporoides** (Vouaux) Nav.-Ros., Hafellner & Calat. ad int. [= *Didymella epipolytropica* var. *apiosporoides* Vouaux]; on *Aspicilia*; **barrenoana** Calat. & Nav.-Ros.: on *Rhizoplaca peltata*; **caudata** Kernst.: on *Xanthocarpia lactea* and other Teloschistaceae; **cecidiformans** Grube & Hafellner: on *Rhizocarpon*; **cladoniicola** Alstrup: on *Cladonia*; **crozalsiana** (H.Olivier) Nav.-Ros., Cl.Roux & Casares: on *Squamarina*; **declorella** (Nyl.) O.Eriksson & Yue: on terricolous algae, mosses and lichens; **epicallopisma** Arnold: on *Variospora aurantia*; **epicarphinea** (Nyl.) Grube & Hafellner: on *Usnochroma*; **epidesertorum** Nav.-Ros. & Calat. ad int.: on *Gyalolechia desertorum*; **epipolytropica** (Mudd) Arnold: on *Lecanora*; **epithamnolia** Zhurb.: on *Thamnolia*; **etayoana** Nav.-Ros. & Calat. ad int.: on *Physcia caesia*; **exiguella** (Nyl.) Arnold: on *Rinodina mniaraea*; **galligena** Hafellner & Nav.-Ros.: on *Aspicilia*; **hypotrachynicola** Etayo: on *Hypotrachyna*; **javallambrensis** Calat. & Nav.-Ros. ad int.: on *Aspicilia desertorum*; **lecidomae** Zhurb. & Triebel: on *Lecidoma demissum*; **lobothalliae** Nav.-Ros. & Calat.: on *Lobothallia*; **macrospora** (Uloth) Hafellner & Nav.-Ros. [= *C. ulothii* Körb.]: on *Protoparmeliopsis*; **melanophthalmae** Nav.-Ros., Calat. & Hafellner: on *Rhizoplaca melanophthalma*; **mutabilicola** Calat. et al. ad int.: on *Megaspora verrucosa* var. *mutabilis*; **ochrolechia** Zhurb.: on *Ochrolechia* and *Pertusaria coriacea*; **parva** Hafellner & Ihlen: on *Baeomyces*; **pluriseptata** (Nyl.) Arnold: on crustose saxicolous lichens; **punctillata** (Nyl.) R.Sant. [= *C. lichenicola* (Zopf) Hafellner]: on *Solorina* and *Peltigera*, reported from many other hosts; **rinodinae** Etayo & van den Boom: on *Rinodina conradii*; **solearispora** Calat., Nav.-Ros. & Hafellner: on *Aspicilia*; **soror** Obermayer & Triebel: on *Arthrorhaphis citrinella*; **stenotropae** Nav.-Ros. & Hafellner ad int.: on *Lecanora* gr. *polytropica*; **stereocaulorum** (Arnold) Hafellner: on *Stereocaulon*; **thamnogalloides** Zhurb.: on *Thamnolia*; **thamnoliae** Zhurb.: on *Thamnolia*; **thamnoliicola** Ihlen: on *Thamnolia*; **trypteliza** (Nyl.) Hafellner & Obermayer [= *C. arthrorhaphidicola* Alstrup]: on *Arthrorhaphis alpina*; **verrucosaria** (Linds.) Arnold: on *Megaspora verrucosa*; **wernerii** Nav.-Ros., Calat. & Hafellner: on *Aspicilia*; **xanthoriae** (Wedd.) R.Sant.: on *Xanthoria*.

Lit.: Alstrup 1997; Alstrup et al. 1994; Calatayud et al. 2013; Clauzade et al. 1989; Etayo 2010a, 2017; Etayo & van den Boom 2005; Hafellner 1987b, 1993; Hafellner & Obermayer 1995; Ihlen 1995, 1998; Ihlen & Wedin 2007; Navarro-Rosinés et al. 1995, 1996b, 2004, 2009a; Triebel 1989; Triebel & Scholz 2001; Zhurbenko 2010b, 2012; Zhurbenko & Triebel 2003; Zhurbenko et al. 1995.

Echinothecium Zopf; type: *E. reticulatum*. Mol.: no.

Species: 2-0-0. **aerophilum** Alstrup & M.S.Cole: on *Alectoria*; **reticulatum** Zopf [= *Sphaerellothecium reticulatum* (Zopf) Etayo]: on *Parmelia*, doubtfully reported from other parmelioid hosts.

Lit.: Alstrup & Cole 1998; Clauzade et al. 1989; Roux & Triebel 1994; Zhurbenko & Pino-Bodas 2015.

Homostegia Fuckel; type: *H. adusta*, i.e. *H. piggottii*. Mol.: no. A synonym of *Pyrenidium* (fide Navarro-Rosinés et al. in prep.). Species: 2-0-0. **hertelii** D.Hawksw., V.Atienza & M.S.Cole: on *Flavoparmelia caperata*; **piggottii** (Berk. & Broome) P.Karst. [= *H. adusta* Fuckel; = *Phaeospora fritzei* Stein]: on *Parmelia* s.str.

Lit.: Hawksworth et al. 2004.

Koordersiella Höhn.; type: *K. javanica* Höhn. [= *Ascohansfordiellopsis* D.Hawksw.; type: *A. deightonii*; = *Hansfordiellopsis* Deight.; type: *H. aburiensis* Deight.]. Mol.: no.

Species: 6-0-0. **deightonii** (D.Hawksw.) D.Hawksw. & O.E.Erikss. [= *Ascohansfordiellopsis deightonii* D.Hawksw.; = *Hansfordiellopsis elongata* D.Hawksw.]: on foliicolous *Porina* and ?Gomphillaceae; **insectivora** (Hansf.) D.Hawksw. & O.E.Erikss. [= *A. insectivora* (Hansf.) D.Hawksw.; = *H. aburiensis* Deight.; = *H. lichenicola* (Bat. & Maya) Deight.; = *H. deightonii* Bat. & Herr.]: on foliicolous *Asterothyrium*, *Calenia*, *Gyalectidium* and *Trichosaria*; **javanica** Höhn.: on Gomphillaceae; **Hansfordiellopsis minuta** D.Hawksw.: on foliicolous lichens; **tenuissima** (D.Hawksw.) D.Hawksw. [= *H. tenuissima* D.Hawksw.]: on foliicolous lichens; **variegata** (D.Hawksw.) D.Hawksw. [= *H. variegata* D.Hawksw.]: on foliicolous lichens, incl. *Bullatina aspidota*.

Lit.: Eriksson & Hawksworth 1987; Hawksworth 1979a; Matzer 1996.

Lanatosphaera Matzer; type: *L. porinicola*. Mol.: no.

Species: 2-0-0. **dimerellae** Matzer: on foliicolous *Coenogonium subluteum*; **porinicola** Matzer: on foliicolous *Porina epiphylla*.

Lit.: Matzer 1996.

Monodictys S.Hughes; type: *M. putredinis* (Wallr.) S.Hughes. Mol.: yes.

Species: 5-0-0 (50). **anaptychia** (Lindau) D.D.Hawksw.: on *Anaptychia*; **cellulosa** S.Hughes [*M. lepraria* (Berk.) M.B.Ellis]: on various crustose, corticolous lichens; **epilepraria** Kukwa & Diederich: on *Lepraria*; **fuliginosa** Etayo: on *Lobaria* and *Ricasolia*; **phlyctidis** R.C.Harris: on *Phlyctis speirea*.

Lit.: Etayo & Diederich 1996b; Hawksworth 1975, 1979a; Kukwa & Diederich 2005; Muscavitch et al. 2017.

Pseudonitschkia Coppins & S.Y.Kondr.; type: *P. parmotrematis*. Mol.: no.

Species: 1-0-0. **parmotrematis** Coppins & S.Y.Kondr.: on *Parmotrema*.

Lit.: Coppins & Kondratyuk 1995.

Pseudorobillarda M.Morelet; type: *P. phragmitis* (Cunnell) Nag Raj, Morgan-Jones & W.B.Kendr. Mol.: yes (T).

Species: 1-0-0 (12). **peltigerae** Diederich: on *Peltigera*, rarely on *Cladonia*.

Lit.: van den Boom et al. 1998.

Pyrenidium Nyl.; type: *P. actinellum* [= *Dacampiosphaeria* D.Hawksw.; type: *D. rivana*]. Mol.: no. Several species are provisionally placed here, without being formally combined, awaiting the taxonomic revision of the genus.

Species: 13-0-0. **actinellum** Nyl.: on *Scytinium teretiusculum*; **aggregatum** Knudsen & Kocourk.: on *Phaeophyscia*

and *Physcia*; **coccineum** Aptroot: on *Siphula decumbens*; **crozalsii** (Vouaux) Nav.-Ros., comb. inval. (Art. 30.8) [= *Leptosphaeria crozalsii* Vouaux]; on *Aspicilia* gr. *calcarea*; **cryptotheciae** Matzer: on foliicolous *Myriostigma candida*; **Phaeospora granulosae** Arnold: on *Trapeliopsis granulosa*; **hetairizans** (Leight.) D.Hawksw.: on *Staurothele*; **Leptosphaeria leucomelaria** (Mudd) Vouaux: on *Leucodermia leucomelos*; **octosporum** Looman: on an unidentified lichen; **Dacampiosphaeria rivana** (De Not.) D.Hawksw.: on *Peltigera*; **santessonii** Lücking: on *Bacidia psychotriae* and *Bapalmuia*; **sporopodiorum** Matzer: on foliicolous *Sporopodium*; **zamia** (Müll.Arg.) Matzer: on foliicolous *Porina*.

Lit.: Aptroot 2014; Looman 1962; Lücking 1998; Matzer 1996; Navarro-Rosinés 1992; Roux 2014.

Rhabdospora (Sacc.) Sacc.; type: *Septoria oleandri* Durieu & Mont. Mol.: no. A poorly known genus.
Species: 1-0-0 (**150**). **haematommatus** Kalb & Hafellner: on *Haematomma*.
Lit.: Kalb et al. 1995.

Rosellinula R.Sant.; type: *R. haplospora*. Mol.: no.
Species: 4-0-0. **frustulosae** (Vouaux) R.Sant.: on *Lecanora frustulosa* and *L. argopholis*; **haplospora** (Th.Fr.) R.Sant.: on *Aspicilia* and *Bellemerea*; **kalbii** (Hafellner) Hafellner & R.W.Rogers: on *Haematomma puniceum*; **lopadii** (Vouaux) D.J.Galloway: on *Brigantiaea*.
Lit.: Galloway 2004; Hafellner 1985a, 2004.

Sphaerellothecium Zopf; type: *S. araneosum*. Mol.: no.
Species: 35-0-0. **abditum** Triebel: on *Immersaria* and *Lecidea aculeata*; **araneosum** (Arnold) Zopf [= *Echinothecium glabrum* M.S.Christ., Alstrup & D.Hawksw.]; on *Ochrolechia*, *Lepora* and *Varicellaria*; **atryneae** (Arnold) Cl.Roux & Triebel: on *Lecanora bicincta*, *L. cenisia*, *L. rupicola* and *L. swartzii*; **breussii** K.Knudsen, Kocourk. & Etayo: on *Placidium lacinulatum*; **buelliae** (C.W.Dodge) D.Hawksw. & Iturr.: on *Buellia*; **cinerascens** Etayo & Diederich: on *Cladonia parasitica*; **cladoniae** (Alstrup & Zhurb.) Hafellner [= *S. araneosum* var. *cladoniae* Alstrup & Zhurb.]; on *Cladonia* subgen. *Cladonia* and *Stereocaulon*; **cladoniicola** E.S.Hansen & Alstrup: on *Cladonia* subgen. *Cladina*; **conioides** (Nyl.) Cl.Roux & Diederich: on *Baeomyces*; **contextum** Triebel: on *Calvitimela*, *Protoparmelia*, *Rhizocarpon*, *Rhizoplaca* and *Sporastatia*; **epilecanora** Zhurb.: on *Lecanora epibryon*; **episoralium** Etayo: on soralia of *Heterodermia*; **episquamarinae** Etayo: on *Squamarina lentigera*; **gallowayi** Diederich: on *Heterodermia*; **girtaltiae** van den Boom: on *Rinodina*; **gowardii** Alstrup & M.S.Cole: on *Acarospora schleicheri*; **heterodermiae** van den Boom: on *Heterodermia*; **icmadophilae** (R.Sant.) Zhurb.: on *Icmadophila ericetorum*; **leratiannum** Gardiennet & Cl.Roux: on *Brodoa*; **minutum** Hafellner: on *Sphaerophorus*; **pannariacearum** Etayo: on *Pannaria*; **parietinarium** (Linds.) Hafellner & V.John: on *Xanthoria*; **parmeliae** Diederich & Etayo: on *Parmelia*; **parmotrematis** van den Boom [as '*parmotremae*']: on *Parmotrema*; **phaeorrhizae** Diederich & Zhurb.: on *Phaeorrhiza sareptana*; **propinquellum** (Nyl.) Cl.Roux & Triebel: on *Lecanora carpinea* group; **pumilum** (Lettau) Nav.-Ros., Cl.Roux & Hafellner [= *Stigmidium pumilum* (Lettau) Matzer & Hafellner; = *Sphaerellothecium aipolium* Nav.-Ros. & Cl.Roux; =? *Thelidium parvum* C.W.Dodge & G.E.Baker]; on *Physcia*; **siphulae** Zhurb.: on *Siphula ceratites*; **soechtingii**

Zhurb. & Alstrup: on *Arthrorhaphis alpina*; **stereocaulorum** Zhurb.: on *Stereocaulon*; **subtile** Triebel & Rambold: on *Teloschistes*; **thamnoliae** Zhurb. var. **thamnoliae**: on *Thamnolia*; **thamnoliae** Zhurb. var. **taimyricum** Zhurb.: on *Thamnolia*; **usnicola** Etayo: on *Usnea*.

Lit.: Alstrup & Cole 1998; Diederich 2007b; Diederich & Zhurbenko 2009; Etayo 2008, 2017; Etayo & Diederich 1998; Etayo & Sancho 2008; Gardiennet & Roux 2013; Hafellner 1993; Hansen & Alstrup 1995; Hawksworth & Iturriaga 2006; Khodosovtsev et al. 2016; Knudsen et al. 2009b; Navarro-Rosinés & Roux 2017; Navarro-Rosinés et al. 2018; Roux & Triebel 1994; Triebel 1989; Triebel et al. 1991; van den Boom 2010, 2016; Zhurbenko 2007, 2008a, 2015, 2012, 2015; Zhurbenko & Alstrup 2004; Zhurbenko & Brackel 2013; Zhurbenko & Triebel 2008.

Stromatopogon Zahlbr.; type: *S. baldwinii*. Mol.: no.

Species: 3-0-0. **baldwinii** Zahlbr.: on *Usnea*; **cladoniae** Diederich & Sérus.: on *Cladonia*; **geminatum** Etayo & Breuss: on *Usnea*.

Lit.: Diederich 1992a; Diederich & Sérusiaux 2003; Etayo & Breuss 2004.

Trematosphaeriopsis Elenkin; type: *T. parmeliiana*. Mol.: no.

Species: 1-0-0. **parmeliiana** (Jacz.) Elenkin: on *Xanthoparmelia*.

Lit.: Hafellner 2001.

Weddellomyces D.Hawksw.; type: *W. epicallopisma*. Mol.: no.

Species: 12-0-0. **aspiciicola** Alstrup: on *Lobothallia*; **epicallopisma** (Wedd.) D.Hawksw.: on *Protoblastenia*, *Pyrrenodesmia* and *Variospora*; **erythrocarpa** Nav.-Ros. & Cl.Roux: on *Caloplaca erythrocarpa*; **gasparrinae** (C.W.Dodge) D.Hawksw. & Iturr.: on ?*Caloplaca*; **heterochrous** Nav.-Ros. & Cl.Roux: on *Aspicilia*; **macrosporus** D.Hawksw., Renob. & Coppins: on *Aspicilia calcarea* and *Lobothallia radiosa*; **pachyosporicola** Nav.-Ros. & Cl.Roux: on *Aspicilia*; **periphericus** (Taylor) Alstrup & D.Hawksw.: on *Pertusaria pseudocorallina*; **pertusariicola** Halici: on *Varicellaria lactea*; **protearius** Nav.-Ros. & Cl.Roux: on *Leproplaca proteus* and *Rusavskia elegans*; **turcicus** Halici & Orange: on *Acarospora*; **xanthoparmeliae** Calat. & Nav.-Ros.: on *Xanthoparmelia*.

Lit.: Alstrup 1992; Calatayud & Navarro-Rosinés 1998; Halici 2010, Halici et al. 2006; Hawksworth 1978a, 1986, 1990a; Hawksworth & Iturriaga 2006; Navarro-Rosinés & Roux 1995, 1997b.

Class EUROTIIOMYCETES O.E.Erikss. & Winka

Subclass CHAETOTHYRIOMYCETIDAE Doweld

Order Chaetothyriales M.E.Barr.

Family Epibryaceae S.Stenroos & C.Gueidan

Epibryon Döbbeler; type: *E. plagiophilae* (Gonz.Frag.) Döbbeler. Mol.: yes (T).

Species: 4-0-0 (30). **conductrix** (Norman) Nik.Hoffm. & Hafellner [= *Stigmidium catapyrenii* Cl.Roux & Triebel]; on *Catapyrenium cinereum* and *C. daedaleum*; **lichenicola** Matzer: on *Mazosia*; **parvipunctum** (Stein) Diederich: on *Thelidium*; **solorinae** (Vain.) Nik.Hoffm. & Hafellner: on *Solorina*.

Lit.: Hoffmann & Hafellner 2000; Matzer 1996; Sérusiaux et al. 1999.

Family **Herpotrichiellaceae** Munk

Capronia Sacc.; type: *C. sexdecimspora* (Cooke) Sacc. Mol.: yes. Species: 21-0-0 (60). **amylacea** Etayo: on *Peltigera*; **andina** Etayo: on *Placopsis gelida*; **baeomyces** Diederich: on *Baeomyces*; **epilobarina** S.Y.Kondr. & D.J.Galloway: on *Lobaria*; **etayoi** Flakus & Kukwa: on *Cora*; **guatemalensis** Etayo & van den Boom [as 'guatamalense']: on *Parmotrema*; **hypotrachyna** Etayo & Diederich: on *Hypotrachyna* and *Menegazzia*; **josephafellneri** Zhurb. & Etayo: on *Septotrachelia triseptata*; **leopoldiana** Etayo: on *Leptogium*; **leptogii** Etayo & Diederich: on *Leptogium*; **magellanica** Etayo: on *Fuscopannaria*; **minutosetosae** Halıcı, D.Hawksw., A.O.Türk & Candan: on *Thelenella muscorum*; **muellerelloides** Etayo: on *Heterodermia*; **normandinae** R.Sant. & D.Hawksw.: on *Normandina pulchella*; **paranectrioides** Etayo, Flakus & Kukwa: on *Erioderma leylandii*; **pseudonormandinae** Diederich: on *Normandina simodensis*; **santessoniana** Etayo: on *Cora*; **solitaria** Etayo: on *Heterodermia* and perhaps on *Lobaria*, *Lobariella* and *Sticta*; **suijiae** Tsurukau & Etayo: on *Xanthoria parietina*; **thamno-liae** Zhurb.: on *Thamno-liae*; **triseptata** (Diederich) Etayo [= *Muellerella triseptata* Diederich]: on various lichens. Lit.: Aptroot et al.1997; Diederich 1986; Etayo 2002a, 2003, 2010b, 2017; Etayo & Diederich 1998; Etayo & Sancho 2008; Etayo & van den Boom 2006; Etayo et al. 2013b; Flakus & Kukwa 2012; Halıcı et al. 2010; Hawksworth 1990a; Kondratyuk & Galloway 1995a; Tsurukau & Etayo 2017; Zhurbenko 2012; Zhurbenko et al. 2016.

Cladophialophora Borelli; type: *C. carrionii* (Trejos) de Hoog, Kwon-Chung & McGinnis. Mol.: yes (T, L). Asexual, hyphomycetous. Species: 5-0-0 (35). **cladoniae** (Diederich) Diederich: on *Cladonia*; **hawksworthii** (Etayo & Diederich) Diederich: on *Megalospora tuberculosa*; **megalosporae** Diederich: on *Megalospora pachycheila*; **normandinae** (Diederich & Etayo) Diederich: on *Normandina pulchella* [possibly the asexual stage of *Capronia normandinae*]; **parmeliae** (Etayo & Diederich) Diederich & Unter.: mainly on parmelioid lichens, also on *Lobaria* and *Pannaria*. Lit.: Diederich 2010; Diederich et al. 2013; Etayo & Diederich 1995, 1996a; Etayo & Sancho 2008.

Family **Trichomeriaceae** Chomnunti & K.D.Hyde

Knufia L.J.Hutchison & Unter.; type: *K. cryptophialidica* L.J.Hutchison & Unter. Mol.: yes (T, L). Species: 1-0-0 (13). **peltigerae** (Fuckel) Réblová & Unter. [= *Capronia peltigerae* (Fuckel) D.Hawksw.]: on *Peltigera*. Lit.: Hawksworth 1980b; Réblová et al. 2013; Untereiner et al. 2011.

Order Chaetothyriales genera incertae sedis

Laeviomycetes D.Hawksw.; type: *L. pertusariicola*. Mol.: no. Asexual, pycnidial. Species: 1-0-0. **pertusariicola** (Nyl.) D.Hawksw. [= *Lichenodiplis pertusariicola* (Nyl.) Diederich]: on *Pertusaria*. Lit.: Hawksworth 1979a; Zhurbenko & Otte 2012.

Lichenodiplis Dyko & D.Hawksw.; type: *L. lecanorae*. Mol.: yes (T, L). Asexual, pycnidial.

Species: 12-0-0. **anomala** Etayo & Pérez-Vargas [as *anomalus*]: on *Ochrolechia*; **crepsoae** Pérez-Ortega & V.Atiienza: on *Calicium notarisii*; **dendrographae** Diederich & van den Boom: on *Dendrographa*; **fallaciosa** (Hafellner & Kalb) Diederich [possibly the asexual stage of *Muellerella thalamita* (Berger & LaGreca 2014)]: on *Buellia* and *Orcularia*; **hawksworthii** F.Berger & Diederich: on *Pertusaria*; **lecanorae** (Vouaux) Dyko & D.Hawksw. [=? *Vouauxiella caloplacae* Alstrup] [probably the asexual stage of *Muellerella lichenicola* (Muggia et al. 2015a)]: on *Caloplaca* s.l., *Lecanora* s.l. and other crustose lichens; **lecanoricola** (M.S.Cole & D.Hawksw.) Diederich: on *Lecanora*; **lichenicola** Dyko & D.Hawksw.: on *Rinodina*; **ochrolechia** Y.Joshi & M.Tripathi: on *Ochrolechia*; **ope-graphae** (D.Hawksw.) Diederich: on *Opegrapha*; **poeltii** S.Y.Kondr. & D.Hawksw.: on *Xanthoria parietina*; **rinod-nicola** Kocourk. & K.Knudsen: on *Rinodina*. Lit.: Alstrup 1993a; Berger & Diederich 1996; Berger & LaGreca 2014; Cole & Hawksworth 2001; Diederich 2003; Hawksworth 1981; Hawksworth & Dyko 1979; Joshi et al. 2016a; Kalb 1990; Knudsen & Kocourková 2009; Kondratyuk 1996a; Muggia et al. 2015a; Pérez-Vargas et al. 2013.

Lichenodiplisiella S.Y.Kondr. & Kudratov; type: *L. makarevichiae*. Mol.: no. Asexual, pycnidial. Morphologically similar to *Lichenodiplis*. Species: 1-0-0. **makarevichiae** S.Y.Kondr. & Kudratov [as 'makarevichae']: on *Teloschistes brevior*. Lit.: Kondratyuk et al. 2002.

Minutoexcipula V.Atiienza & D.Hawksw.; type: *M. tuckerae*. Mol.: no. Asexual, pycnidial-sporodochial. Species: 7-0-0. **beaglei** Etayo: on *Lecanora*; **calatayudii** V.Atiienza: on *Hypogymnia*; **mariana** V.Atiienza: on *Lepra* and *Pertusaria*; **miniatoexcipula** R.C.Harris & Lendemer: on *Pertusaria*, mainly *P. epixantha*; **tephromelae** V.Atiienza, Etayo & Pérez-Ortega: on *Tephromela*; **tuckerae** V.Atiienza & D.Hawksw.: on corticolous *Pertusaria*; **tuerkii** Hafellner: on *Pertusaria glomerata*. Lit.: Atienza 2002; Atienza & Hawksworth 1994; Atienza et al. 2009; Etayo & Sancho 2008; Hafellner 1994a; Lendemer et al. 2016.

Muellerella Müll.Arg.; type: *M. polyspora* [= *Muellerellomyces* Cif. & Tomas.; type: *M. polyspora* = *Pleothelis* M.Choisy; type: *P. myriocarpa*, i.e. *M. pygmaea*; = *Polycarpella* Theiss. & Syd.; type: *P. cookei*, i.e. *M. erratica*; = *Thelidiola* C.W.Dodge; type: *T. eklundii*, i.e. *Muellerella pygmaea*]. Mol.: yes (L). Bryophylous species may not be congeneric. Species: 12-0-0 (14). **antarctica** Etayo: on *Hypogymnia antarctica*; **atricola** (Linds.) Sacc. & D.Sacc.: on *Tephromela atra*; **erratica** (A.Massal.) Hafellner & V.John [= *M. pygmaea* var. *athallina* (Müll.Arg.) Triebel; = *Polycarpella cookei* (Linds.) Theiss. & Syd.]: on various lichens; **hospitans** Stizenb.: on *Bacidia fraxinea* and *B. rubella*; **lecanactidis** Diederich & van den Boom: on *Sigridea californica*; **lichenicola** (Sommerf.) D.Hawksw. [probably the sexual stage of *Lichenodiplis lecanorae* (Muggia et al. 2015a)]: on various lichens; **polyspora** Müll.Arg. [= *Muellerellomyces polysporae* Cif. & Tomas.]: on diverse lichens; **pygmaea** (Körb.) D.Hawksw. [= *Pleothelis myriocarpa* M.Choisy; = *Thelidiola eklundii* C.W.Dodge]: on various lichens; **stictinae** (H.Olivier) Vouaux: on *Sticta*; **thalamita** (Nyl.) D.Hawksw., F.Berger & LaGreca: on *Baculifer*, *Orcularia* and *Hafellia* [possibly the sexual stage of *Lichenodiplis fallaciosa* (Berger & LaGreca 2014)]; **ventosicola** (Mudd) D.Hawksw.: on *Ophioparma*, possibly

also on *Dimelaena*, *Protoparmelia* and *Rhizocarpon*; **vesicularia** (Linds.) D.Hawksw.: on *Toninia*.

Lit.: Berger & LaGreca 2014; Clauzade et al. 1989; Diederich 2003; Etayo & Sancho 2008; Hawksworth 1985a; Muggia et al. 2015a; Triebel 1989.

Order Pyrenulales D.Hawksw. & O.E.Erikss.

Family Reuquenellaceae Boise

Distopyrenis Aptroot; type: *D. americana* Aptroot. Mol.: no.
Species: 1-0-0 (8). **japonica** Harada: on *Graphis proserpens*.
Lit.: Harada 2000.

Lacrymospora Aptroot; type: *L. parasitica*. Mol.: no.
Species: 1-0-0. **parasitica** Aptroot: probably lichenicolous on a sterile corticolous lichen (?*Myriotrema*).
Lit.: Aptroot 1991.

Parapyrenis Aptroot; type: *P. aurora* (Zahlbr.) Aptroot. Mol.: no.
Species: 1-0-0 (8). **lichenicola** Aptroot & Diederich: on ?*Pertusaria*.
Lit.: Aptroot et al. 1997.

Order Verrucariales D.Hawksw. & O.E.Erikss.

Family Adelococcaceae Triebel

Adelococcus Theiss. & Syd.; type: *A. alpestris*. Mol.: no.
Species: 4-0-0. **alpestris** (Zopf) Theiss. & Syd.: on *Acarospora*; **immersus** Etayo & Breuss: on *Dermatocarpon biennense*; **interlatens** (Arnold) Matzer & Hafellner: on *Clauzadea*, *Hymenelia*, *Ionaspis*, *Polysporina* and *Sarcogyne*; **porocyphii** S.Zelenko & S.Y.Kondr.: on *Porocyphus*.
Lit.: Etayo & Breuss 1998; Kondratyuk & Zelenko 2002; Matzer & Hafellner 1990.

Sagediopsis Vain.; type: *S. tartarina*, i.e. *S. campsteriana*. Mol.: no.
Species: 10-0-0. **aquatica** (Stein) Triebel: on *Koerberiella wimmeriana*; **aspiciliae** Nik.Hoffm. & Hafellner: on *Aspicilia myrinii*; **barbara** (Th.Fr.) R.Sant. & Triebel: on *Porpidia*; **bayozturkii** Halıcı, Güllü & Parnikoza: on *Acarospora mycrocyclos*; **campsteriana** (Linds.) D.Hawksw. & R.Sant. [= *S. tartarina* (Nyl.) Vain.]: on *Ochrolechia*; **dissimilis** Triebel: on *Paraporpidia leptocarpa*; **fissurisedens** Hafellner: on *Aspicilia myrinii*; **lomnitzensis** (Stein) Orange: on *Ionaspis lacustris* and *I. odora*; **pertusariicola** Zhurb.: on *Pertusaria*; **vasilyevae** Zhurb.: on *Rhizocarpon*.
Lit.: Alstrup & Hawksworth 1990; Hafellner 1993; Halıcı et al. 2017; Hoffmann & Hafellner 2000; Orange 2002; Triebel 1989; Triebel 1993; Zhurbenko 2009c; Zhurbenko & Yakovchenko 2014.

Family Sarcopyreniaceae Nav.-Ros. & Cl.Roux

Sarcopyrenia Nyl.; type: *S. gibba* [= *Hassea* Zahlbr.; type: *H. bacillosa*]. Mol.: no.
Species: 11-0-0. **acutispora** Nav.-Ros. & Cl.Roux: on cf. *Bagliettoa calciseda*; **bacillosa** (Nyl.) Nav.-Ros. & Hladun [= *Hassea bacillosa* (Nyl.) Zahlbr.]: on saxicolous lichens;

bacillospora Nav.-Ros. & Hladun: on *Thelidium* and *Verrucaria*; **baetica** Nav.-Ros. & Hladun: on *Lecania* cf. *erysibe*; **beckhausiana** (J.Lahm) M.B.Aguirre, Nav.-Ros. & Hladun: on saxicolous lichens, mainly Verrucariaceae; **cylindrospora** (P.Crouan & H.Crouan) M.B.Aguirre: mainly on *Aspicilia*; **gibba** (Nyl.) Nyl. var. **gibba**: on saxicolous lichens, incl. *Acarospora* and *Aspicilia*; **gibba** var. **geisleri** (Beckh.) Nav.-Ros. & Hladun: on saxicolous lichens; **lichinellae** Nav.-Ros. & Hladun: on *Lichinella stipatula*; **pluriseptata** Nav.-Ros. & Cl.Roux: on *Pyrenodesmia variabilis*; **sigmoideospora** Tretiach & Nav.-Ros.: on *Bagliettoa*.

Lit.: Knudsen & Lendemmer 2006; Navarro-Rosinés & Hladun 1990; Navarro-Rosinés & Hladun 2004; Navarro-Rosinés et al. 1998b, 2009b; Tretiach & Navarro-Rosinés 1996.

Family Verrucariaceae Zenker

Bellemerella Hafellner & Cl.Roux; type: *B. trapeliae*. Mol.: no.
Species: 4-0-0. **acarosporae** Calat. & Nav.-Ros.: on *Acarospora fuscata*; **polysporinae** Calat. & Nav.-Ros.: on *Polysporina simplex*; **ritae** Pérez-Ortega & T.Sprib.: on *Xylographa*; **trapeliae** Nav.-Ros. & Cl.Roux: on *Trapelia*.
Lit.: Calatayud & Navarro-Rosinés 2001; Navarro-Rosinés & Roux; 1997a; Pérez-Ortega & Spribille 2007.

Clauzadella Nav.-Ros. & Cl.Roux; type: *C. gordensis*. Mol.: no.
Species: 1-0-0. **gordensis** Nav.-Ros. & Cl.Roux: on *Verrucaria viridula*.
Lit.: Navarro-Rosinés & Roux 1996.

Endococcus Nyl.; type: *E. rugulosus* [= *Discothecium* Zopf; type: *D. stigma*]. Mol.: yes (L). Several poorly known species are provisionally placed here, without being formally combined in this genus.

Species: 44-0-0. **alectoriae** (D.Hawksw.) D.Hawksw.: on *Alectoria*; **apiciicola** (J.Steiner) R.Sant.: on *Usnea*; **brachysporus** (Zopf) M.Brand & Diederich: on *Porpidia*; **Microthelia calcaricola** Mudd: on *Aspicilia*; **caudisporus** J.C.David & Etayo: on *Lathagrium auriforme*; **cladiae** Zhurb. & Pino-Bodas: on *Cladia*; **complanatae** Arnold: on *Miriquidica*; **exerrans** Nyl.: on *Rhizocarpon*; **Verrucaria fumosaria** Leight.: on *Lecidea fuscoatra*; **fusiger** Th.Fr. & Almq.: on *Rhizocarpon*; **incrassatus** Etayo & Breuss: on *Placidiopsis*; **janae** K.Knudsen: on *Acarospora rhabarbarina*; **karlstadtensis** Kocourk. & Brackel: on *Endocarpon*; **Tichothecium latzelii** Keissl.: on *Collema*; **macrosporus** (Arnold) Nyl.: on *Rhizocarpon*; **matzeri** D.Hawksw. & Iturr.: on *Buellia*; **Mycoporum melacoccum** Nyl.: on a sterile, saxicolous lichen with a sorediate C+ red thallus; **nanellus** Ohlert: on *Stereocaulon*; **oreinae** Hafellner: on *Dimelaena oreina*; **oropogonicola** Etayo: on *Oropogon*; **pallidosporus** Etayo: on *Pseudocyphellaria*; **parentium** Etayo: on *Pseudocyphellaria*; **parmeliarum** Etayo: on *Parmelia saxatilis*; **pellax** Nyl.: on *Collema*; **peltigericola** Zhurb. & Stepanchikova: on *Peltigera*; **perminutus** Vain.: on *Bacidia subincompta*; **perpusillus** Nyl.: on *Schaereria*, also reported from other saxicolous lichens; **propinquus** (Körb.) D.Hawksw.: on *Porpidia*, also reported from other saxicolous lichens; **protoblasteniae** Diederich: on *Protoblastenia*; **pseudocarpus** Nyl.: on *Callome*, *Enchylium*, *Lathagrium*, *Peltula* and *Scytinium*; **pseudocyphellariae** Etayo: on *Pseudocyphellaria* (also *Nephroma*); **ramalinarius** (Linds.) D.Hawksw.: on *Ramalina*; **rugulosus** (Leight.)

- Nyl.: on *Verrucaria*, also reported from other saxicolous lichens; **sendtneri** (Arnold) Hafellner: on *Polyblastia sendtneri*; **sipmanii** Etayo: on *Heterodermia*; **stigma** (Körb.) Stizenb. [= *Discothecium stigma* (Körb.) Zopf]: on *Acarospora*; **thamnoiae** Etayo & R.Sant.: on *Thamnoia*; **thelommatis** Kocourk. & K.Knudsen: on *Thelomma santessonii*; **tricolorans** Alstrup: on *Platismatia glauca*; **variabilis** Halıcı, Kocourk. & Diederich: on *Staurothele*; **verrucosporus** Alstrup: on *Ionaspis lacustris*; **verrucosus** Hafellner: on *Aspicilia*; **xanthoparmeliae** Y.Joshi, S.Y.Kondr., L.Lökös & Hur: on *Xanthoparmelia*; **zahlbrucknerellae** (Henssen) D.Hawksw.: on *Zahlbrucknerella*.
Lit.: Alstrup 1993b, 1996; Alstrup et al. 1994; Brackel & Kocourková 2006; David & Etayo 1995; Etayo 2002a, 2010b, 2017; Etayo & Breuss 2001; Etayo & Sancho 2008; Hafellner 1994a; Hafellner et al. 2002, 2008; Halıcı et al. 2007b; Hawksworth 1979b, 1982a; Hawksworth & Iturriaga 2006; Joshi et al. 2015; Knudsen 2008; Kocourková & Knudsen 2011a; Matzer 1993; Matzer et al. 1996; Santesson 1994b; Sérusiaux et al. 1999; Triebel 1989; Zhurbenko & Pino-Bodas 2015; Zhurbenko et al. 2012.
- Haleomyces** D.Hawksw. & Essl.; type: *H. oropogonicola*. Mol.: no.
Species: 1-0-0. **oropogonicola** D.Hawksw. & Essl.: on *Oropogon lopezii*.
Lit.: Hawksworth & Esslinger 1993.
- Heteroplacidium** Breuss; type: *H. imbricatum* (Nyl.) Breuss (lichenized). Mol.: yes (T, L).
Species: 0-3-0 (12). **fusculum** (Nyl.) Gueidan & Cl.Roux: lichen, juvenile parasite on *Aspicilia calcarea*; **transmutans** K.Knudsen, Breuss & Kocourk.: lichen, juvenile parasite on *Acarospora socialis*; **zamenhofianum** (Clauzade & Cl.Roux) Cl.Roux [= *Verrucaria zamenhofiana* Clauzade & Roux]: lichenicolous lichen on *Staurothele areolata*, eventually becoming independent.
Lit.: Breuss 1994; Knudsen et al. 2014.
- Halospora** (Zschacke) Tomas. & Cif.; type: *H. deminuta*. Mol.: no.
Species: 4-0-0. **deminuta** (Arnold) Tomas. & Cif. [= *Merismatium deminutum* (Arnold) Cl.Roux & Nav.-Ros.]: on *Polyblastia*, *Staurothele*, *Thelidium* and *Verrucaria*, etc.; **discrepans** (Arnold) Hafellner [= *M. discrepans* (Arnold) Triebel]: mainly on *Protoblastenia*, also on *Aspicilia*, *Hymenelia*, *Verrucaria*, etc.; **longispora** (Cl.Roux & Nav.-Ros.) Hafellner [= *M. deminutum* subsp. *longisporum* Cl.Roux & Nav.-Ros.]: on endolithic lichens; **scammoeca** (Lettau) Hafellner [= *M. scammoecum* Lettau]: on *Polyblastia*, *Thelidium* and *Verrucaria*.
Lit.: Hafellner 2011; Roux et al. 2002; Triebel 1989.
- Norrinia** Theiss. & Syd.; type: *N. peltigericola*. Mol.: no.
Species: 2-0-0. **medoborensis** S.Y.Kondr.: on *Peltigera*; **peltigericola** (Nyl.) Theiss. & Syd.: on *Peltigera*.
Lit.: Hawksworth 1980b; Kondratyuk & Galloway 1995a.
- Phaeospora** Stein; type: *P. rimosicola*. Mol.: no.
Species: 14-0-0. **arctica** Horáková & Alstrup: on *Arctoparmelia*, *Cetraria* and *Nephromopsis*; **catolechiae** Zopf: on *Catolechia wahlenbergii*; **everniae** Etayo & van den Boom: on *Evernia*; **exoriens** (Stirt.) A.L.Sm.: on *Pannaria*; **lecanorae** Eitner: on *Lecanora* and *Myriolecis*; **parasitica** (Lönnr.) Arnold: on *Rhizocarpon* [and *Lopadium*?]; **peltigericola** D.Hawksw.: on *Peltigera* and *Pseudocyphellaria* [and *Lobaria*?]; **perrugosaria** (Linds.) D.J.Galloway: on *Placopsis*; **protoblasteniae** Alstrup & Olech: on *Protoblastenia incrustans*; **quaterna** Eitner: on *Rhizocarpon*; **rimosicola** (Mudd) Stein: on *Rhizocarpon* [also reported on *Aspicilia* and *Diplotomma*]; **squamarinae** Etayo: on *Squamarina cartilaginea*; **subantarctica** Øvstedal & D.Hawksw.: on *Lecania gerlachei*; **verrucariae** Alstrup & E.S.Hansen: on *Verrucaria placynthiae*.
Lit.: Alstrup & Hansen 2001; Alstrup & Olech 1996; Etayo 2010c; Galloway 2004; Hawksworth 1980b, 1983; Horáková & Alstrup 1994; Øvstedal & Hawksworth 1986; Sérusiaux et al. 1999; van den Boom & Etayo 2014; Zhurbenko 2014.
- Placidiopsis** Beltr.; type: *P. grappae* Beltr. (lichenized). Mol.: yes (T).
Species: 0-1-0 (20). **minor** var. **longispora** Etayo & Breuss: lichenicolous lichen on *Diploschistes*.
Lit.: Etayo 2017.
- Placocarpus** Trevis.; type: *P. schaereri*. Mol.: yes (T, L).
Species: 0-3-0 (5). **americanus** K.Knudsen, Breuss & Kocourk.: lichen, juvenile parasite on *Protoparmeliopsis muralis*; **melanophthalmosus** Cl.Roux & Gueidan: lichen, juvenile parasite on *Rhizoplaca melanophthalma*; **schaereri** (Fr.) Breuss: lichen, juvenile often parasitic on *Protoparmeliopsis muralis*.
Lit.: Breuss 1985; Knudsen et al. 2009a; Roux & Gueidan 2011; Zhurbenko & Notov 2015.
- Placopyrenium** Breuss; type: *P. bucekii* (Nádv. & Servít) Breuss (lichenized). Mol.: yes (T, L).
Species: 0-6-0 (22). **breussii** Cl.Roux & Gueidan: lichen, juvenile parasite on *Aspicilia calcitrapa*; **canellum** Nyl.: lichen, juvenile parasite on *Aspicilia*; **cinereoatrum** (Degel.) Orange: facultatively lichenicolous on *Staurothele fissa*; **formosum** Orange: lichen, juvenile parasite on *Aspicilia aquatica*; **fuscellum** (Turner) Gueidan & Cl.Roux: lichen, juvenile facultatively parasite on *Bagliettoa* and *Verrucaria*; **noxium** Breuss: lichenicolous lichen on *Staurothele areolata*.
Lit.: Breuss 1998, 2009; Orange 2004, 2009; Roux & Gueidan 2011.
- Telogalla** Nik.Hoffm. & Hafellner; type: *T. olivieri*. Mol.: no.
Species: 2-0-0. **cajasense** Etayo: on *Leptogium*; **olivieri** (Vouaux) Nik.Hoffm. & Hafellner: on *Xanthoria*.
Lit.: Etayo 2017; Hoffmann & Hafellner 2000.
- Thelidium** A.Massal.; type: *T. amylicum* A.Massal. Mol.: yes.
Species: 0-1-0 (100). **impresulium** Zschacke: on *Verrucaria* with an endolithic thallus.
Lit.: Roux 2014.
- Verrucaria** Schrad.; type: *V. rupestris* Schrad. (lichenized). Mol.: yes (T). Currently polyphyletic.
Species: 1-5-0 (300). **bernardinensis** Breuss: lichenicolous lichen on *Staurothele*; **cetera** Breuss: lichenicolous lichen on *Staurothele areolata*, eventually becoming independent; **conturmatula** Nyl.: on *Ionaspis lacustris*; **falcata** Breuss: lichen appearing lichenicolous on or between areoles of *Verrucaria maculicarpa*; **inficiens** Breuss: lichenicolous lichen on *Staurothele areolata* and *S. elenkinii*, eventually becoming independent; **placynthiae** Alstrup & E.S.Hansen: lichenicolous lichen on *Placynthium nigrum*.
Lit.: Alstrup & Hansen 2001; Breuss 1998, 2007; Orange 2002.
- Verrucula** J.Steiner; type: *V. aegyptiaca*. Mol.: yes (L).
Species: 0-22-0. **aegyptiaca** (Müll.Arg.) J.Steiner: lichenicolous lichen on *Variospora*; **ahlesiana** (Zwackh) J.Steiner:

lichen, probably lichenicolous; **arnoldaria** Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Calogaya arnoldii*; **biatorinaria** (Zehetl.) Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Calogaya biatorina*; **clauzadaria** Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Caloplaca clauzadeana*; **coccinearia** (Zehetl.) Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Caloplaca coccinea*; **coronataria** Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Flavoplaca coronata*; **elegantaria** (Zehetl.) Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Rusavskia elegans*; **fulvaria** Nav.-Ros. & Cl.Roux ad int.: lichenicolous lichen on *Leproplaca proteus*; **granulosaria** (Clauzade & Zehetl.) Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Flavoplaca granulosa*; **helvetica** (B. de Lesd.) Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Leproplaca cirrochroa*; **hladuniana** (Nav.-Ros. & Cl.Roux) Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Flavoplaca marina*; **inconnexaria** Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Caloplaca inconnexa*; **lactearia** Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Xanthocarpia lactea* s.str.; **latericola** (Erichs.) Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Calogaya pusilla*; **maritimaria** Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Flavoplaca maritima*; **microspora** Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Variospora velana*; **navasaria** Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Flavoplaca navasiana*; **polycarparia** Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Flavoplaca polycarpa*; **protearia** (Zehetl.) Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Leproplaca proteus*; **pusillaria** Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Calogaya pusilla*; **tarracensis** Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Variospora*.

Lit.: Hoffman & Hafellner 2000; Navarro-Rosinés et al. 2007; Roux 2014; Zehetleitner 1978.

Verruculopsis Gueidan, Nav.-Ros. & Cl.Roux; type: *V. poeltiana*. Mol.: yes (T, L).

Species: 0-3-0 (6). **flavescentaria** Gueidan, Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Calogaya flavescens*; **irrubescens** (Ménard & Cl.Roux) Gueidan, Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Caloplaca irrubescens*; **poeltiana** (Clauzade & Cl.Roux) Gueidan, Nav.-Ros. & Cl.Roux: lichenicolous lichen on *Calogaya aurantia*.

Lit.: Ménard & Roux 1991; Navarro-Rosinés et al. 2007.

Order Verrucariales genera incertae sedis

Gemmaspora D.Hawksw. & Halıcı; type: *G. lecanorae*. Mol.: no. Species: 1-0-0. **lecanorae** (Werner) D.Hawksw. & Halıcı: on *Aspicilia*.

Lit.: Hawksworth & Halıcı 2007.

Merismatium Zopf; type: *M. lopadii* (Arnold) Zopf, i.e. *M. nigritlellum* [= *Heterophracta* (Sacc. & D.Sacc.) Theiss. & Syd.; type: *Leptosphaerulina heterophracta*, i.e. *M. heterophractum*; *Phaeocyrtis* Vain.; type: *P. consocians*, i.e. *M. heterophractum*]. Mol.: no.

Species: 10-0-0. **cladoniicola** Alstrup: on *Cladonia ciliata*; **coccisporum** (Norm.) Vouaux: on *Amygdalaria*, *Euopsis*, etc.; **coccotremicola** Etayo: on *Coccotrema*; **corae** (Pat.) Etayo & R.Sant.: on *Cora*; **decolorans** (Arnold) Triebel [= *Sphaerulina dolichotera* (Nyl.) Vouaux; =? *S. intermedia* Vouaux]: on *Lopadium*, *Bilimbia*, *Placynthiella*, *Trapeliopsis*, etc.; **heterophractum** (Nyl.) Vouaux [= *Leptosphaerulina heterophracta* (Nyl.) Sacc. & D.Sacc.; =

Phaeocyrtis consocians (Nyl.) Vain.]: on *Biatora*, *Bilimbia*, *Lopadium*, etc.; **lecanorae** (H.Olivier) Vouaux: on *Ochrolechia parella*; **nigritlellum** (Nyl.) Vouaux [= *M. lopadii* (Arnold) Zopf]: on *Catapyrenium*, *Leptogium*, *Lichenomphalia*, *Lopadium*, *Micarea*, *Mycobilimbia*, *Ochrolechia*, *Protoblastenia*, etc.; **peregrinum** (Flot.) Triebel: on *Rimularia*; **thamnollicola** Alstrup & E.S.Hansen: on *Thamnolia*.

Lit.: Alstrup 1997; Alstrup & Hansen 2001; Etayo 2010b; Etayo & Sancho 2008; Hafellner 2011; Hertel & Rambold 1990; Triebel 1989.

Pseudostigmidium Etayo; type: *P. nephromiarium*. Mol.: no.

Species: 5-0-0. **biseptatum** Etayo: on *Pseudocyphellaria*; **confusum** Etayo: on *Pseudocyphellaria*; **disparatum** Etayo: on *Pseudocyphellaria*; **fumosum** Etayo: on *Pseudocyphellaria*; **nephromiarium** (Linds.) Etayo: on *Nephroma antarcticum*.

Lit.: Etayo & Sancho 2008.

Stigmidium Trevis.; type: *S. schaeferi* [= *Pharcidia* Körb.; type: *P. congesta*, i.e. *S. congestum*]. Mol.: no.

Species: 94-0-0 (95). **acetabuli** Calat. & Triebel: on *Pleurosticta acetabulum*; **aggregatum** (Mudd) D.Hawksw.: on *Aspicilia*; **ahtii** Etayo & Palice: on apothecia of *Cladonia lopezii*; **alectoriae** (Linds.) Etayo: on *Usnea*; **allogenum** (Nyl.) D.Hawksw.: on *Rhizocarpon*; **arthoniae** (Arnold) Hafellner: on *Arthonia*; **arthrorhaphidis** Hafellner & Obermayer: on *Arthrorhaphis citrinella*; **aspiciliae** (J.Lahm) Cl.Roux: on *Aspicilia* gr. *calcareae*; **bellemerei** Cl.Roux & Nav.-Ros.: on *Lecania*; **beringicum** Zhurb. & Triebel: on *Stereocaulon*; **buelliae** Zhurb. & Himelbrant: on *Buellia disciformis*; **californicum** K.Knudsen & Kocourk.: on *Caloplaca stanfordensis*; **calopadiae** Matzer: on foliicolous *Calopadia*; **cartilagineae** Calat. & Triebel: on *Squammarina*; **cerinae** Cl.Roux & Triebel: on *Caloplaca* s.str., also reported from other Teloschistaceae; **cladoniicola** Zhurb. & Diederich: on *Cladonia*; **clauzadei** Cl.Roux & Nav.-Ros.: on *Verrucaria*; **coarctatae** S.Y.Kondr., L.Lökös & J.-S.Hur: on *Trapelia coarctata* [ascomata setose: *Niesslia*?]; **collematis** Cl.Roux & Triebel: on *Collema*; **congestum** (Körb.) Triebel [= *Pharcidia congesta* Körb.]; on apothecia of *Lecanora* gr. *chlarotera*; **conspurcans** (Th.Fr.) Triebel & R.Sant.: on *Psora rubiformis*; **croceae** (Arnold) Cl.Roux & Triebel: on *Solorina*; **cupulare** (Pat.) D.Hawksw.: on *Sticta*; **degelii** R.Sant.: on *Degelia*; **disconephromeum** Etayo: on *Nephroma antarcticum*; **divaricatae** E.Zimm. & F.Berger: on *Evernia divaricata*; **ephebes** (Henssen) D.Hawksw.: on *Ephebe*; **epinesolechia** Etayo: on *Nesolechia oxyspora* galls over *Punctelia*; **epiphyllum** Matzer: on foliicolous *Actinoplaca* and *Echinoplaca*; **epistigmellum** (Vouaux) Kocourk. & K.Knudsen: on marine *Polycaulonia*; **epixanthum** Hafellner: on *Acarospora*; **eucline** (Nyl.) Vězda: on *Varicellaria*; **exasperatum** Etayo: on *Melanohalea exasperata*; **frigidum** (Sacc.) Alstrup & D.Hawksw.: on *Thamnolia*; **fuscatae** (Arnold) R.Sant.: on *Acarospora*; **glebarum** (Arnold) Hafellner: on *Toninia*; **grex** Alstrup & Olech: on *Ochrolechia* cf. *frigida*; **gyrophorarum** (Arnold) D.Hawksw. [= *Endococcus gyrophorarum* (Arnold) J.C.David & D.Hawksw.]: on *Umbilicaria*; **haesitans** (Nyl.) Diederich, comb. nov. [= *Pharcidia haesitans* Nyl.]: on *Protothelenella sphinctrinoides*; **hafellneri** Zhurb.: on *Nephromopsis cucullata*; **hageniae** (Rehm) Hafellner: on *Anaptychia* and *Physconia*; **hesperium** Kocourk., K.Knudsen & Diederich: on *Polycaulonia* and *Wetmoreana*;

heterodermiae Etayo: on *Heterodermia*; **humidum** Pérez-Ortega, Halıcı & K.Knudsen: on *Thelenella muscorum*; **hygrophilum** (Arnold) R.Sant.: on *Rhizocarpon* and *Porpidia*; **hypotrachynicola** Etayo: on *Hypotrachyna*; **joergensenii** R.Sant.: on *Agonimia foliacea*; **johnii** Halıcı & D.Hawksw.: on *Caloplaca* s.l.; **lecidellae** Triebel, Cl.Roux & Le Coeur: on *Lecidella elaeochroma*; **lendemeri** Kocourk. & K.Knudsen: on *Aspicilia*; **leprariae** Zhurb.: on *Lepraria neglecta*; **leptogii** Etayo: on *Leptogium*; **leucophlebiae** Cl.Roux & Triebel: on *Peltigera leucophlebia*; **lichenum** (Arnold) Triebel & P.Scholz: on *Verrucaria maculiformis*; **lobariae** Zhurb. & Etayo: on *Lobaria*; **marinum** (Deakin) Swinscow: on maritime *Verrucaria*; **Pharcidia maritima** B. de Lesd.: on *Verrucaria* [a poorly known taxon provisionally placed here]; **micareae** van den Boom: on *Micarea alabastrites*; **microcarpum** Alstrup & J.C.David: on *Cetraria* and *Nephromopsis cucullata*; **microspilum** (Körb.) D.Hawksw.: on *Graphis scripta*; **microsporium** Etayo & Osorio: on *Teloschistes*; **mittellii** Cl.Roux & Bricaud: on *Pannaria conopsea*; **mycobilimbiae** Cl.Roux, Triebel & Etayo: on *Bilimbia*; **neofusceliae** Calat. & Triebel: on *Xanthoparmelia pulla*; **parmotrematis** F.Berger & E.Zimm.: on *Parmotrema*; **parvum** (Henssen) Diederich, comb. nov. [= *Pharcidia parva* Henssen]: on *Ephebe lanata*; **peltideae** (Vain.) R.Sant.: on *Peltigera*, also reported from *Pseudocyphellaria*, *Solorina* and *Sticta*; **petri** Hafellner: on *Clauzadea monticola*; **placopsidis** E.Zimm. & F.Berger: on *Placopsis*; **placynthii** Cl.Roux & Nav.-Ros.: on *Placynthium nigrum*; **porinae** Matzer: on foliicolous *Porina*; **pseudopeltideae** Cl.Roux & Triebel: on *Peltigera*; **psorae** (Anzi) Hafellner: on *Psora* and *Psorula*; **ramalinae** (Müll.Arg.) Etayo & Diederich [= *S. epiramalina* (Vouaux) Hafellner]: on *Ramalina*; **rivulorum** (Kernst.) Cl.Roux & Nav.-Ros.: on *Verrucaria*; **rouxianum** Calat. & Triebel: on *Acarospora cervina*; **schaereri** (A.Massal.) Trevis.: on *Solorina* thalli parasitized by *Dacampia hookeri*; **schizoporum** Matzer: on foliicolous *Porina*; **seirophorae** Etayo & van den Boom: on *Seirophora scorigena*; **solorinarium** (Vain.) D.Hawksw.: on *Solorina*; **spgazzinii** Etayo: on *Pseudocyphellaria*; **squamariae** (B. de Lesd.) Cl.Roux & Triebel: on *Lecanora*, *Protoparmeliopsis* and *Rhizoplaca*; **squamarinicola** Calat. & Triebel: on *Squamarina*; **stereocaulorum** Zhurb. & Triebel: on *Stereocaulon*; **stygnospilum** (Minks) R.Sant.: on *Dermatocarpon*; **subcladonicola** van den Boom: on *Cladonia*; **superpositum** (Nyl.) D.Hawksw.: on *Sporodictyon*; **tabacinae** (Arnold) Triebel: on *Toninia*; **tetrasperum** Etayo: on *Verrucariaceae*; **trichotheliorum** Matzer: on foliicolous *Trichothelium*; **triebelsiae** Etayo: on *Parmotrema*; **Pharcidia verrucarium** (Arnold) Sacc. & D. Sacc.: on *Verrucaria* [a poorly known taxon provisionally placed here]; **vezdae** Matzer: on foliicolous *Fellhanera colchica*; **xanthoparmelium** Hafellner: on *Xanthoparmelia*.

Lit.: Alstrup 1993a; Alstrup & Hawksworth 1990; Alstrup & Olech 1996; Berger & Zimmermann 2016; Calatayud & Triebel 1999, 2001; Clauzade et al. 1989; Etayo 1994, 2000, 2002a, 2010c, 2017; Etayo & Sancho 2008; Hafellner 1982c, 1994a, 1994b; Hafellner & Obermayer 1995; Hafellner et al. 2008; Hawksworth 1975; Kihlman 1891; Kocourková & Knudsen 2009a, 2009b, 2010, 2012; Kondratyuk et al. 2016b; Lord et al. 2013; Matzer 1996; Matzer & Hafellner 1990; Molitor & Diederich 1997; Pérez-Ortega et al. 2010; Roux 2014; Roux & Navarro-Rosinés 1994; Roux & Triebel 1994; Roux et al. 1995; Santesson 1989, 1993b; Triebel 1989; Triebel & Scholz 2001; Roux et al. 1998; van den Boom 2016; van den Boom & Etayo 2017; Zhurbenko & Etayo 2012; Zhurbenko & Diederich 2008; Zhurbenko et al. 2012; Zimmermann & Berger 2018.

Subclass MYCOCALICIOMYCETIDAE Tibell

Order Mycocaliciales Tibell & Wedin

Family Mycocaliciaceae A.F.W.Schmidt

Chaenothecopsis Vain.; type: *C. rubescens*. Mol.: yes (L).

Species: 24-0-9 (40). **arthoniae** Tibell: on *Arthonia vinoso*; **australis** Tibell: on *Lecanactis abietina*; **brevipes** Tibell: on *Arthonia* and *Lecanactis*; **cinerea** Tibell: on *Lecanactis abietina*; **consociata** (Nádv.) A.F.W.Schmidt: on *Chaenotheca chrysocephala*; **dibbleandersoniarum** Selva: on *Felipes leucopellaeus*; **epithallina** Tibell: on *Chaenotheca trichialis*; **formosa** Titov: on *Chaenotheca sphaerocephala*; **haematopus** Tibell: facultatively lichenicolous; **hospitans** (Th.Fr.) Tibell: on *Haematomma ochroleucum* and *Lecanora*; **kalbii** Tibell & K.Ryman: on *Lecanora caesiorubella*; **lecanactidis** Tibell: on *Lecanactis abietina*; **leifiana** Titov: on *Arthonia*; **lignicola** (Nádv.) A.F.W.Schmidt: facultatively lichenicolous, especially on *Chaenotheca*; **nigra** Tibell: on *Chaenotheca*; **ochroleuca** (Körb.) Tibell & K.Ryman: on *Haematomma ochroleucum*; **parasitaster** (Bagl. & Carestia) D.Hawksw.: on *Cladonia*; **pilosa** Tibell & Kalb: on *Tylophoron*; **pusilla** (Ach.) A.F.W.Schmidt: on *Calicium*, *Chaenotheca*, *Psilolechia*, algae or most commonly lignicolous; **pusiola** (Ach.) Vain.: on *Chaenotheca* or saprophytic; **retinens** (Nyl.) Tibell: on *Inoderma byssaceum* and *Sporodophoron cretaceum*; **rubescens** Vain.: on *Inoderma byssaceum*, other lichens with *Trentepohlia* or saprophytic; **rubina** Tibell: on *Pyrgidium montellanicum*; **sagenidii** Tibell: on *Lecanactis mollis*; **savonica** (Räsänen) Tibell: on *Chaenotheca* or saprophytic; **sinensis** Titov: on unidentified lichen with chlorococcoid algae; **subparvoica** (Nyl.) Tibell: on *Haematomma ochroleucum*; **tasmanica** Tibell: on diverse lichens, incl. *Chaenotheca chrysocephala*; **treicheliana** (Stein) Kalb: on corticolous *Lecanora*; **vainioana** (Nádv.) Tibell: on *Arthonia*, *Lecanactis abietina*, *Calicium salicinum*, other lichens with *Trentepohlia* or saprophytic; **vinosa** Titov: on lichen; **viridialba** (Kremp.) A.F.W.Schmidt: on *Chaenotheca chrysocephala* or saprophytic; **viridireagens** (Nádv.) A.F.W.Schmidt: on *Calicium*, *Chaenotheca* or on free-living algae.

Lit.: Clauzade et al. 1989; Gasparyan et al. 2014; Selva 2013; Tibell 1991b, 1998; Tibell & Ryman 1995; Titov 2006.

Mycocalicium Vain.; type: *M. parietinum* (Ach.) Vain. Mol.: yes. Species: 3-0-0 (12). **chiodectonicola** Aptroot & Etayo: on *Chiodecton*; **enterographicola** Aptroot & M.Cáceres: on *Enterographa* cf. *quassiaecola*; **rapax** Tibell: on *Pertusaria*. Lit.: Aptroot et al. 2016; Etayo & Aptroot 2017; Titov 2006.

Sphinctrina Fr.; type: *S. turbinata*. Mol.: yes (T, L).

Species: 9-0-0. **anglica** Nyl.: on *Protoparmelia*; **benmargana** Selva: on *Pertusaria*; **intermedia** Tibell: on *Pertusaria*; **leucopoda** Nyl.: on *Pertusaria* and *Diploschistes*; **ophioparmae** Kalb: on *Ophioparma araucariae*; **pallidella** (Willey) Selva: on *Pertusaria*; **paramerae** D.Muñiz & Hladun: on *Pertusaria paramera*; **tubaeformis** A.Massal.: on *Pertusaria*; **turbinata** (Pers.) de Not.: on *Pertusaria*. Lit.: Kalb 2001; Löfgren & Tibell 1979; Muñiz et al. 2013; Purvis et al. 1992; Tibell et al. 2014; Titov 2006.

Subclass SCLEROCOCCOMYCETIDAE Réblová, Unter. & W.Gams

Order **Sclerococcales** Réblová, Unter. & W.GamsFamily **Dactylosporaceae** Bellem. & Hafellner [= Sclerococcaceae Réblová, Unter. & W.Gams]

Sclerococcum Fr.; type: *S. sphaerale* [= *Dactylospora* Körb.; type: *D. floerkei*, i.e. *D. parasitica*]. Mol.: yes (T, L).
 Species: 60-0-4 (80). **acarosporae** S.Y.Kondrat.: on *Acarospora*; **acarosporicola** Ertz & Diederich, nom. nov. [= *Dactylospora acarosporae* (H.Magn.) Hafellner]: on *Acarospora*; **aeruginosum** (Holien & Ihlen) Ertz & Diederich, comb. nov. [= *D. aeruginosa* Holien & Ihlen]: on various lichens, also on bark or wood; **ahatii** (Zhurb. & Pino-Bodas) Ertz & Diederich, comb. nov. [= *D. ahatii* Zhurb. & Pino-Bodas]; on *Cladonia*; **allantoideum** (Alstrup & D.Hawksw.) Ertz & Diederich, comb. nov. [= *D. allantoidea* Alstrup & D.Hawksw.]: on *Xanthoparmelia pulla*; **amygdalariae** (Triebel) Ertz & Diederich, comb. nov. [= *D. amygdalariae* Triebel]: on *Amygdalaria*; **anziaae** (Zhurb., Ezhkin, Skirina & Y.Ohmura) Ertz & Diederich, comb. nov. [= *D. antziae* Zhurb., Ezhkin, Skirina & Y.Ohmura]: on *Anzia*; **aprototii** Diederich: on *Fissurina dumastii*; **areolatum** Etayo: probably on *Xylographa*; **aspiciliicola** (Alstrup & D.Hawksw.) Ertz & Diederich, comb. nov. [= *D. aspiciliicola* Alstrup & D.Hawksw.]: on *Aspicilia*; **athallinum** (Müll.Arg.) Ertz & Diederich, comb. nov. [= *D. athallina* (Müll.Arg.) Hafellner; =? *Abrothallus placophyllus* Anzi]: on *Baeomyces*; **attendendum** (Nyl.) Ertz & Diederich, comb. nov. [= *D. attendenda* (Nyl.) Arnold]: on *Amygdalaria*, *Icmadophila*, *Pilophorus* and *Porpidia*; **australe** (Triebel & Hertel) Ertz & Diederich, comb. nov. [= *D. australis* Triebel & Hertel]: on *Cocotrema*, *Lecidea*, *Parapropidia*, *Poeltiaria*, *Poeltidea*, *Porpidia*, *Rimularia* and *Tremolecia*; **boreale** (Holien & Ihlen) Ertz & Diederich, comb. nov. [= *D. borealis* Holien & Ihlen]: on *Mycoblastus*, other lichens or directly on the bark; **cladoniicola** (Alstrup & Olech) Ertz & Diederich, comb. nov. [= *D. cladoniicola* Alstrup & Olech]: on *Cladonia*; **crassitunicatum** Zhurb., Diederich & U.Braun: on *Cladonia*; **crassum** (Sarrion & Hafellner) Ertz & Diederich, comb. nov. [= *D. crassa* Sarrion & Hafellner]: saprotrophic on *Juniperus oxycedrus*, also on old *Parmelia*; **dauidii** (Hafellner & H.Mayrhofer) Ertz & Diederich, comb. nov. [= *D. dauidii* Hafellner & H.Mayrhofer]: on *Pseudocyphellaria*; **deminutum** (Th.Fr.) Ertz & Diederich, comb. nov. [= *D. deminuta* (Th.Fr.) Triebel; = *D. rinodinicola* Alstrup & D.Hawksw.]: on various lichens; **dobrowskii** (Olech & Alstrup) Ertz & Diederich, comb. nov. [= *D. dobrowskii* Olech & Alstrup]: on *Calogaya saxicola*; **epicladonia** Zhurb.: on *Cladonia*; **epiphytorum** Diederich: on *Pertusaria coccodes* and *Varicellaria hemisphaerica*; **frigidum** (Hafellner) Ertz & Diederich, comb. nov. [= *D. frigida* Hafellner]: on *Brigantiaea*; **gelidarium** Etayo & F.Berger: on *Placopsis*; **glaucomarioides** (Tuck.) Ertz & Diederich, comb. nov. [= *D. glaucomarioides* (Tuck.) Hafellner]: on *Ochrolechia*; **hafellnerianum** (Sérus.) Ertz & Diederich, comb. nov. [= *D. hafellneriana* Sérus.]: on *Santessonia lagunebergii*; **heterodermiae** (Etayo) Ertz & Diederich, comb. nov. [= *D. heterodermiae* Etayo]: on *Heterodermia*; **homoclinellum** (Nyl.) Ertz & Diederich, comb. nov. [= *D. homoclinella* (Nyl.) Hafellner]: on *Lecanora* and *Tephromela*; **inconspicuum** (Etayo) Ertz & Diederich, comb. nov. [= *D. inconspicua* Etayo]: on *Menegazzia*; **inquilinum** (Tuck.) Ertz & Diederich, comb. nov. [= *D. inquilina* (Tuck.) Hafellner]: on corticolous *Pertusaria*; **leuckertii** Diederich & P.Scholz: on *Buellia aethalea*; **lobariellum** (Nyl.) Ertz & Diederich, comb. nov.

[= *D. lobariella* (Nyl.) Hafellner]: on *Lobaria* and *Ricasolia*, also reported on *Pseudocyphellaria*; **microsporum** (Etayo) Ertz & Diederich, comb. nov. [= *D. microspora* Etayo]: on *Catnaria atropurpurea*; **montagnei** Hafellner: on *Lecanora rupicola*; **olivaceum** Etayo & F.Berger: on *Flavoparmelia soredians*; **ophthalmizae** Coppins, sp. nov.: on *Lepra ophthalmiza*; **orygmaeum** (Nyl.) Ertz & Diederich, comb. nov. [= *D. orygmaea* (Nyl.) S.Y.Kondrat. & D.J.Galloway]: on *Pseudocyphellaria berberina*; **parasitaster** (Nyl.) Ertz & Diederich, comb. nov. [= *D. parasitaster* (Nyl.) Arnold]: on *Biatora sphaeroides* and *Thelenella muscorum*; **parasiticum** (Flörke) Ertz & Diederich, comb. nov. [= *D. parasitica* (Flörke) Zopf; = *D. floerkei* Körb., nom. illeg.; = *Sclerophyton occidentale* Herre]: on *Lepra*, *Ochrolechia* and *Pertusaria*; **parellarium** (Nyl.) Ertz & Diederich, comb. nov. [= *D. parellaria* (Nyl.) Arnold]: on *Ochrolechia parella*; **pertusariicola** (Tuck.) Ertz & Diederich, comb. nov. [= *D. pertusariicola* (Tuck.) Hafellner]: on saxicolous *Pertusaria*; **phaeophysciae** Diederich & van den Boom: on *Phaeophyscia orbicularis*; **phyllobaeis** Etayo: on *Phyllobaeis*; **pleiospermum** (Triebel) Ertz & Diederich, comb. nov. [= *D. pleiosperma* Triebel]: on *Lecanora caesiorubella*; **polysporum** (Triebel) Ertz & Diederich, comb. nov. [= *D. polyspora* Triebel]: on *Protoparmelia*; **porphyreum** (Hafellner & Kalb) Ertz & Diederich, comb. nov. [= *D. porphyrea* Hafellner & Kalb]: on *Bacidia*, *Brigantiaea* and *Phyllopsora*; **prothallinum** (Anzi) Ertz & Diederich, comb. nov. [= *D. prothallina* (Anzi) Hafellner]: on *Fuscopannaria* and *Parmeliella*; **purpurascens** (Triebel) Ertz & Diederich, comb. nov. [= *D. purpurascens* Triebel]: on *Amygdalaria*, *Pilophorus* and *Porpidia*; **pyrenaicum** (Etayo) Ertz & Diederich, comb. nov. [= *D. pyrenaica* Etayo]: over bryophytes, perhaps associated with *Mycobilimbia pilularis*; **rhyparizae** (Arnold) Ertz & Diederich, comb. nov. [= *D. rhyparizae* Arnold]: on *Bryodina rhypariza*; **rimulicola** (Müll.Arg.) Ertz & Diederich, comb. nov. [= *D. rimulicola* (Müll.Arg.) Hafellner]: on *Lecanora* and *Pertusaria*; **rostrupii** (Alstrup) Ertz & Diederich, comb. nov. [= *D. rostrupii* Alstrup]: on *Lepra dactylina*; **saxatile** (Schaer.) Ertz & Diederich, comb. nov. [= *D. saxatilis* (Schaer.) Hafellner]: on *Ochrolechia* and *Pertusaria*; **saxatile** var. **laureri** (Hafellner) Ertz & Diederich, comb. nov. [= *D. saxatilis* var. *laureri* Hafellner]: on *Pertusaria*; **serusiauxii** Boqueras & Diederich: on *Parmelina*; **simplex** D.Hawksw.: on corticolous *Lepra* and *Pertusaria*; **sipmanii** Diederich: on *Anomomorpha* cf. *roseola*; **sphaerale** (Ach.) Fr.: on saxicolous *Pertusaria* [mainly *P. corallina*]; **suburceolatum** (Coppins & Fryday) Ertz & Diederich, comb. nov. [= *D. suburceolata* Coppins & Fryday]: on a whitish-yellowish muscicolous crustose lichen; **tegularum** (Arnold) Ertz & Diederich, comb. nov. [= *D. tegularum* (Arnold) Hafellner]: on *Caloplaca* s.l., incl. *Rufoplaca*; **tephromelarum** Etayo & Calat.: on *Tephromela*; **toensbergii** Diederich: on *Megalaria pulvereae* and *Pertusaria carneopallida*; **urceolatum** (Th.Fr.) Ertz & Diederich [= *Dactylospora urceolata* (Th.Fr.) Arnold]: on *Protothelenella sphinctrinoides*, also reported from other hosts; **verrucisporum** Alstrup: on *Bellemerea diamarta*.
 Lit.: Alstrup 1993a; Alstrup & Hawksworth 1990; Alstrup & Olech 1993; Alstrup et al. 1994; Berger 2000; Boqueras & Diederich 1993; Brackel 2014; Clauzade et al. 1989; Diederich 1990, 2015; Diederich & Scholz 1995; Diederich & van den Boom 2017; Diederich et al. 2013; Etayo 1991, 2010c, 2017; Etayo & Berger 2002; Etayo & Calatayud 1998; Etayo & Sancho 2008; Fryday & Coppins 2012; Hafellner 1979, 1985b, 1996b; Hafellner & Mayrhofer 2007; Hafellner et al. 2002; Hawksworth 1975, 1979a, 2003; Ihlen et al. 2004a; Kondratyuk & Galloway 1995; Kondratyuk & Zelenko 2002; Olech & Alstrup 1996; Pino-Bodas et al. 2017; Réblová et al. 2017; Sarrion et al. 2002; Sérusiaux & Wessels 1984; Sparrius 2004;

Triebel 1989; Zhurbenko & Pino-Bodas 2017; Zhurbenko et al. 2017.

Class Eurotiomycetes familia incertae sedis

Family Rhynchostomataceae Winka & O.E.Erikss.

Rhynchomeliola Speg.; type: *R. pulchella* Speg. Mol.: yes (fide Wijayawardene et al. 2017).
Species: 1-0-0 (3). **lichenicola** Henssen & Kantvilas: on *Wawea*.
Lit.: Henssen & Kantvilas 1985.

Class LECANOROMYCETES O.E.Erikss. & Winka

Subclass ACAROSPOROMYCETIDAE Reeb, Lutzoni & Cl.Roux

Order Acarosporales Reeb, Lutzoni & Cl.Roux

Family Acarosporaceae Zahlbr.

Acarospora A.Massal.; type: *A. schleicheri* (Ach.) A.Massal. (lichenized). Mol.: yes (T, L). Some species described by H. Magnusson are poorly known.
Species: 0-25-0 (200). **anatolica** H.Magn.: lichenicolous lichen on *Dimelaena*; **brevilobata** H.Magn.: lichenicolous lichen on *Rhizocarpon*; **epithallina** H.Magn.: lichenicolous lichen on *Acarospora hilaris* and *Usnochroma carphinea*; **freyi** H.Magn.: facultatively lichenicolous lichen on *Aspicilia*; **heufleriana** Körb.: lichenicolous lichen on *Lecanora valesiaca*; **hospitans** H.Magn.: lichenicolous lichen on *Aspicilia*, *Bellemerea*, *Leanora*, *Lecidea* and *Tremolecia*; **imbricatula** H.Magn.: facultatively lichenicolous lichen on *Aspicilia*; **impressula** Th.Fr.: facultatively lichenicolous lichen on *Aspicilia*; **insignis** H.Magn.: lichenicolous lichen on *Aspicilia*; **insolata** (B. de Lesd.) Redinger: lichenicolous lichen on *Immersaria* and *Rhizocarpon*, becoming independent; **interjecta** H.Magn.: lichenicolous lichen on *Acarospora novomexicana*; **invadens** H.Magn.: lichenicolous lichen on *Aspicilia* and *Dimelaena*, becoming independent; **jenisejensis** H.Magn.: lichenicolous lichen on *Buellia*, *Dimelaena* and *Lecanora*, becoming independent; **microcarpa** (Nyl.) Weddell: lichenicolous lichen on *Diploschistes actinostomus*, more rarely *Acarospora*, *Dimelaena* and *Ingvariella*, becoming independent; **nashii** K.Knudsen: lichenicolous lichen on *Dimelaena* and *Pleopsidium*, becoming independent; **nodulosa** (Dufour) Hue: facultatively lichenicolous lichen on *Diploschistes diacapsis*; **pulvinata** H.Magn.: lichenicolous lichen on *Aspicilia*; **sphaerospora** H.Magn.: lichenicolous lichen on *Aspicilia*, becoming independent; **stapfiana** (Müll.Arg.) Hue: lichenicolous lichen on *Caloplaca* s.l. and *Rusavskia elegans*; **strigata** (Nyl.) Jatta: lichenicolous lichen on *Aspicilia*, becoming independent; **succedens** H.Magn.: facultatively lichenicolous lichen on *Dimelaena oreina*; **superans** H.Magn.: lichenicolous lichen on *Aspicilia* and *Dimelaena*; **suprasedens** H.Magn.: lichenicolous lichen on *Aspicilia* and *Lecanora*; **tominiiana** H.Magn.: lichenicolous lichen on *Aspicilia*; **umbrina** H.Magn.: lichenicolous lichen on *Lecanora*.

Lit.: Knudsen 2011; Knudsen & Kocourková 2010a; Rambold & Triebel 1992.

Myriospora Nägeli; type: *M. rufescens* (Ach.) Nägeli (lichenized). Mol.: yes (T).
Species: 0-1-0 (9). **hassei** (Herre) K.Knudsen & L.Arcadia: facultatively lichenicolous lichen (juvenile obligately lichenicolous?) on *Acarospora socialis*.
Lit.: Knudsen & Bungartz 2014.

Polysporina Vězda; type: *P. simplex* (Taylor) Vězda (lichenized). Mol.: yes (T, L).
Species: 3-0-0 (10). **arenacea** (H.Magn.) K.Knudsen & Kocourk.: on crustose lichens on siliceous rocks; **pusilla** (Anzi) Kantvilas: on crustose lichens on calcareous rocks, e.g., *Acarospora*, *Caloplaca* s.l., *Protoblastenia*; **subfuscescens** (Nyl.) K.Knudsen & Kocourk.: on crustose lichens on siliceous rocks, e.g., *Acarospora*, *Buellia*, *Caloplaca* s.l., *Candelariella*, *Lecidea*.
Lit.: Knudsen & Kocourková 2008.

Sarcogyne Flot.; type: *S. corrugata* Flot. (lichenized). Mol.: yes (L).
Species: 0-1-0 (28). **sphaeospora** J.Steiner: lichenicolous lichen on *Candelariella*.
Lit.: Lendemer et al. 2009; Pino-Bodas et al. 2017.

Subclass CANDELARIOMYCETIDAE Timdal & M.Westb.

Order Candelariales Miądl., Lutzoni & Lumbsch

Family Candelariaceae Hakul.

Candelariella Müll.Arg.; type: *C. vitellina* (Ehrh.) Müll.Arg. (lichenized). Mol.: yes (T).
Species: 0-2-0 (50). **dispersa** (Räsänen) Hakul.: lichenicolous lichen on *Placynthium*; **superdistans** (Nyl.) Malme: lichenicolous lichen on *Lecanora populicola*.
Lit.: Gilbert & James 2009.

Subclass LECANOROMYCETIDAE Miądl., Lutzoni & Lumbsch

Order Caliciales Bessey

Family Caliciaceae Chevall.

Acolium (Ach.) Gray; type: *A. sessile*. Mol.: yes.
Species: 2-0-0 (5). **marcianum** (B. de Lesd.) M.Prieto & Wedin [≡ *Cyphelium marcianum* B. de Lesd.]: on *Pertusaria*, mainly *P. pseudocorallina*; **sessile** (Pers.) Trevis. [≡ *C. sessile* (Pers.) Trevis.]: on *Pertusaria coccodes* and other corticolous *Lepra* and *Pertusaria*.
Lit.: Giavarini & Purvis 2009a; Prieto & Wedin 2017; Tibell 1971.

Amandinea Scheid. & M.Mayrhofer; type: *A. conioops* (Wahlenb.) Scheid. & M.Mayrhofer. Mol.: yes (T).

Species: 2-0-0 (35). **adjuncta** (Th. Fr.) Hafellner [= *Buellia adjuncta* Th. Fr.]: on *Lecanora straminea* (possibly also on *Caloplaca* and *Rinodina olivaceobrunnea*); **deminuta** Hafellner (Febr. 2004) [= *Buellia uruguayensis* Etayo & Osorio (July 2004)]: on *Caloplaca felpiponei*.

Lit.: Etayo & Osorio 2004; Hafellner 2004c.

Buellia De Not.; type: *B. disciformis* (Fr.) Mudd (lichenized). Mol.: yes (T, L).

Species: 6-8-0 (300). **albulella** Elix: on *Buellia albula*; **caloplacivora** Llimona & Egea: lichenicolous lichen on *Caloplaca* s.l., becoming independent; **campbelliana** Elix: lichenicolous lichen on basal squamules of *Cladonia*; **griseosquamulata** Scheidegger: lichenicolous lichen on *Buellia tirolensis*; **imshaugii** Hafellner: lichenicolous lichen on *Dimelaena oreina*; **insularis** Øvstedal: lichenicolous lichen on *Pannaria* and *Vestergrenopsis*; **miriquidica** Scheidegger: lichenicolous lichen on *Schaereria fuscocinerea*; **servilosina** Elix & Kantvilas: on *Xanthoparmelia mougeotina*; **subadjuncta** Elix & Kantvilas: on *Caloplaca lateritia*; **teloschistis** Vězda: on *Teloschistes*; **thelotremicola** Elix: on *Thelotrema*; **uberior** Anzi: lichenicolous lichen on *Schaereria fuscocinerea*, soon becoming independent; **uberiuscula** (Nyl.) Zahlbr.: facultatively lichenicolous lichen on *Acarospora fuscata*; **vouauxii** Calat. & Barreno: on *Rhizoplaca melanophthalma*. Lit.: Calatayud & Barreno 1995; Clauzade et al. 1989; Elix 2018; Elix et al. 2017; Hafellner 1979; Llimona & Egea 1984; Øvstedal et al. 2009; Rambold & Triebel 1992; Scheidegger 1987, 1998.

Caliciella Vain.; type: not selected. Mol.: no.

Species: 1-0-0. **parasitica** Räsänen: on *Chaenotheca furfuracea*. Lit.: Clauzade et al. 1989; Kaufmann & Hofmann 1998.

Calicium Pers.; type: *C. viride* Pers. Mol.: yes (T, L).

Species: 1-0-0. **corynellum** (Ach.) Ach.: on *Haematomma ochroleucum* and other saxicolous lichens. Lit.: Roux 2014.

Dimelaena Norman; type: *D. oreina* (Ach.) Norman (lichenized). Mol.: yes (T).

Species: 0-1-0 (10). **lichenicola** K.Knudsen., Sheard, Kocourk. & H.Mayrhofer: lichen, juvenile lichenicolous on *D. oreina* and *D. thysanota*. Lit.: Knudsen et al. 2013.

Diplotomma Flot.; type: *D. alboatrum* (Hoffm.) Flot. (lichenized). Mol.: yes (T).

Species: 1-6-0 (30). **murorum** (A.Massal.) Coppins: lichenicolous lichen on *Caloplaca teicholyta*; **nivale** (Bagl. & Carestia) Hafellner: on *Rusavskia* and *Caloplaca* s.l., soon with its own thallus; **parasiticum** (B. de Lesd.) Diederich, Cl.Roux & Van Haluwyn: on *Myriolecis*; **renobalesiii** Cl.Roux [= *Buellia lecanoricola* Renob., nom. nud.]: on *Myriolecis albescens*, soon with its own thallus; **scheideggerianum** (Bricaud & Cl.Roux) Nimis: lichenicolous lichen on *Leproplaca xantholyta*; **venustum** Körb.: juvenile lichenicolous lichen on *Protoparmeliopsis versicolor*, soon with its own thallus; **vezdanum** (P.Scholz & Knoph) Coppins: lichenicolous lichen on *Polycauliona verruculifera*. Lit.: Bricaud & Roux 1991; Duke & Purvis 2009; Hafellner 1979; Renobales 1996; Roux 2014.

Endohyalina Marbach; type: *E. rappii* (R.C.Harris) Marbach (lichenized). Mol.: no.

Species: 2-1-0 (10). **brandii** Giralt, van den Boom & Elix: on *Aspicilia intermutans*, often lichenized with an own thallus; **diederichii** Giralt, van den Boom & Elix: on *Ramalina*, rarely lichenized with a reduced thallus; **insularis** (Arnold) Giralt, van den Boom & Elix: on *Lecanora rupicola* agg., very rarely lichenized with a reduced thallus.

Lit.: Giralt et al. 2010.

Monerolechia Trevis.; type: *M. bayrhofferi* (Schaer.) Trevis. Mol.: yes (L).

Species: 0-4-0. **badia** (Fr.) Kalb [= *Buellia badia* (Fr.) A.Massal.]: lichen, juvenile parasite on saxicolous lichens; **californica** (H.Magn.) Elix [= *Dimelaena californica* (H.Magn.) Sheard]: lichen, juvenile parasite on saxicolous *Dimelaena radiata*; **glomerulans** (Müll.Arg.) Elix [= *Buellia glomerulans* (Müll.Arg.) Zahlbr.]: lichen, juvenile parasite on *Xanthoparmelia*; **norstictica** Elix: lichen, juvenile parasite on saxicolous *Lecanora* or *Pertusaria*. Lit.: Elix 2015; Kalb 2004.

Tetramelas Norman; type: not selected. Mol.: yes (L).

Species: 2-1-0 (16). **concinus** (Th.Fr.) Giralt: lichenicolous lichen on *Buellia*, *Melanelia*, *Parmelia*, *Physcia* and *Pseudephebe*, becoming independent; **phaeophysciae** A.Nordin & Tibell: on *Phaeophyscia* and *Physcia*; **pulverulentus** (Anzi) A.Nordin & Tibell [= *Buellia pulverulenta* (Anzi) Jatta]: mainly on *Physconia*, also on *Anaptychia*, *Phaeophyscia* and *Physcia*. Lit.: Hafellner & Poelt 1980; Nordin & Tibell 2005; Scheidegger & Ruff 1988.

Family Physciaceae Zahlbr.

Rinodina (Ach.) Gray; type: *R.sophodes* (Ach.) A.Massal. (lichenized). Mol.: yes (T, L).

Species: 1-9-0 (300). **afghanica** Steiner & Poelt: lichenicolous lichen on *Calogaya polycarpoides* and *Diplotomma alboatrum*; **canariensis** Matzer, H.Mayrhofer & Clerc: lichenicolous lichen on saxicolous lichens; **egedeana** (Linds.) Alstrup & D.Hawksw.: on *Parmelia* and *Peltigera*; **epimilvina** H.Mayrhofer: lichenicolous lichen on *Rinodina milvina*; **milvina** (Wahlenb.) Th.Fr.: lichen, facultatively lichenicolous on saxicolous lichens; **milvinoides** H.Mayrhofer: lichenicolous lichen on *Aspicilia*; **obnascens** (Nyl.) H.Olivier: lichenicolous lichen on *Aspicilia* and *Rhizocarpon*; **parasitica** H.Mayrhofer & Poelt: lichenicolous lichen on *Aspicilia*, *Lecanora* and *Lecidea*; **santorinensis** J.Steiner: lichen, facultatively lichenicolous on *Diploicia*, *Ochrolechia*, *Pertusaria*, etc.; **superposita** H.Magn.: lichenicolous lichen on *Lecanora* and *Lecidea*. Lit.: Alstrup & Hawksworth 1990; Matzer et al. 1994; Mayrhofer 1984a, 1984b; Rambold & Triebel 1992.

Order Lecanorales Nannf.

Family Catillariaceae Hafellner

Catillaria A.Massal.; type: *C. chalybeia* (Borrer) A.Massal. (lichenized). Mol.: yes (T).

Species: 3-1-0 (150). **lobariicola** (Alstrup) Coppins & Aptroot [= *Scutula lobariicola* Alstrup; = *Phoma lobariicola*

Alstrup]: on *Lobarina scrobiculata*; **mediterranea** Hafellner: lichenicolous lichen with a reduced thallus, on *Anaptychia ciliaris* and *Niebla bourgaeana*; **stereocaulorum** (Th.Fr.) H.Olivier [= *Scutula stereocaulorum* (Th.Fr.) Körb.]: on *Stereocaulon*; **usneicola** Etayo: on *Usnea*.
Lit.: Alstrup 1997; Etayo 2000; Hafellner 1982b.

Family Lecanoraceae Körb.

Carbonea (Hertel) Hertel; type: *C. atronivea* [Huea C.W.Dodge & G.E.Baker may represent an earlier synonym, fide Fryday 2011]. Mol.: yes (L).

Species: 11-6-0 (20). **aggregantula** (Müll.Arg.) Diederich & Triebel: on *Lecanora* (mainly *L. polytropa*), also reported from *Rhizoplaca*; **antarctica** (C.W.Dodge & G.E.Baker) D.Hawksw. & Iturr.: on *Pseudephebe*; **assimilis** (Körb.) Hafellner & Hertel: lichenicolous lichen on *Aspicilia*, *Lecanora*, *Lecidea*, *Pertusaria*, *Rhizocarpon* and *Tephromela*; **atronivea** (Arnold) Hertel: lichenicolous lichen on *Lecidella*, becoming independent; **degelii** Alstrup: on *Lecanora intricata*; **distans** (Kremp.) Hafellner & Obermayer var. **distans**: lichenicolous lichen on *Lecidea obscurissima* and *Orphniospora mosigii*; **distans** var. **buelliarum** (Hertel) Hertel: lichenicolous lichen on *Buellia*; **herteliana** Hafellner & Matzer: on *Rhizocarpon*; **Catillaria hospitans** H.Magn.: on *Lecidea* [a poorly known taxon, provisionally placed here]; **intrudens** (H.Magn.) Hafellner: on *Rhizocarpon*; **invadens** (H.Magn.) Andreev: lichen, juvenile lichenicolous on *Rhizocarpon geographicum*; **neuropogonis** Etayo: on *Usnea aurantiaco-atra*; **Nesolechia oxysporiza** J.Steiner: on *Lecanora polytropa* [probably a *Carbonea*, fide Roux 2014]; **superjecta** (Nyl.) Hertel: on *Lecanora disjungenda*; **super-sparsa** (Nyl.) Hertel: on *Lecanora* (mainly *L. polytropa*), rarely *Rhizoplaca*; **vitellinaria** (Nyl.) Hertel: on *Candelariella*; **vorticosa** (Flörke) Hertel: lichen, facultatively lichenicolous on *Physcia dubia*.

Lit.: Alstrup et al. 1994; Chambers et al. 2009; Ertz et al. 2014a; Etayo & Sancho 2008; Hafellner 1999, 2006; Hawksworth & Iturriaga 2006; Hertel 1967; Obermayer 1993; Rambold & Triebel 1992, Roux 2014.

Lecanora Ach.; type: *L. allophana* Nyl. (lichenized). Mol.: yes (T).

Species: 3-13-0 (550). **dispersa** f. **parasitans** (Wedd.) Harm.: lichenicolous lichen on *Dermatocarpon minutum*; **epithallina** H.Magn.: lichenicolous lichen on *Tingiopsidium isidiatum*; **gisleriana** Müll.Arg.: lichenicolous lichen on *Lecanora epanora*, *L. handelii* and *L. subaurea*; **gyrophorina** Poelt & Zhurb.: lichenicolous lichen on *Umbilicaria hyperborea*; **invadens** H.Magn.: lichenicolous lichen on *Aspicilia asiatica*; **laatokaensis** (Räsänen) Poelt: lichenicolous lichen on *Aspicilia* and other lichens, when young; **lasalliae** Pérez-Ortega & Etayo: on *Lasallia pustulata*; **latro** Poelt: lichenicolous lichen on *Miriquidica nigroleprosa*; **lecanoricola** (Alstrup, D.Hawksw. & R.Sant.) Rambold & Triebel [= *Lecidella lecanoricola* Alstrup, D.Hawksw. & R.Sant.]: on *Lecanora cenisia*; **mosigiicola** (Eitner) Hertel & Rambold var. **mosigii-cola**: lichenicolous lichen on *Orphniospora mosigii*; **mosigi-cola** var. **buelliarum** (Hertel) Hertel & Rambold: lichenicolous lichen on *Buellia*; **nohedensis** Cl.Roux & M.Barbero: lichenicolous lichen on *Placopyrenium breussii*; **printzenii** Pérez-Ortega, Vivas & Hafellner: lichenicolous lichen on *Umbilicaria*; **thallophila** H.Magn.: lichenicolous lichen on *Dermatocarpon*; **tolypodes** Poelt & Vězda: lichen-

icolous lichen on *Aspicilia* cf. *grisea*; **usneicola** Etayo: on *Usnea antarctica*.

Lit.: Etayo & Sancho 2006; Hafellner 1995b; Lumbsch et al. 2011; Pérez-Ortega & Etayo 2008; Poelt et al. 1996; Rambold & Triebel 1992; Ryan et al. 2004; Zhurbenko 2009.

Lecidella Körb.; type: *L. viridans* (Flot.) Körb. (lichenized). Mol.: yes.

Species: 0-2-0 (80). **dimelaenophila** Hertel: lichen, juvenile lichenicolous on *Dimelaena oreina*; **vorax** Leuckert & Poelt: lichenicolous lichen on *Lecanora rupicola*.

Lit.: Rambold & Triebel 1992.

Miriquidica Hertel & Rambold; type: *M. complanata* (Körb.) Hertel & Rambold (lichenized). Mol.: yes (T).

Species: 0-6-0 (30). **complanata** (Körb.) Hertel & Rambold: juvenile facultatively lichenicolous lichen on *Rhizocarpon* gr. *geographicum*; **instrata** (Nyl.) Hertel & Rambold: facultatively lichenicolous lichen on *Aspicilia* (and on *Rhizocarpon*?); **intrudens** (H.Magn.) Hertel & Rambold: lichenicolous lichen on *Rhizocarpon*; **invadens** Hafellner, Obermayer & Tretiach: lichenicolous lichen on *Sporastatia*, becoming independent; **nigroleprosa** (Vain.) Hertel & Rambold: juvenile facultatively lichenicolous lichen on *Rhizocarpon* gr. *geographicum*; **verrucariicola** (B.D.Ryan) K.Knudsen & Kocourk. [= *Protoparmelia ryaniana* van den Boom, Sipman & Elix, nom. illeg.]: lichenicolous lichen on *Dimelaena radiata*, *Tephromela* and *Verrucaria subdivisa*, becoming independent.

Lit.: Hafellner et al. 2005, 2014; Hertel & Rambold 1987; Knudsen et al. 2015; Rambold & Triebel 1992.

Family Parmeliaceae Zenker

Nesolechia A.Massal; type: *N. oxyspora*. Mol.: yes (T, L). All lichenicolous species, except *N. falcispora*, often develop subspherical to lobate or foliose gall-like structures that may be regarded as an own lichenized thallus. A high morphological plasticity, sometimes correlated with host selection, has led to the description of many poorly characterized taxa, most of which are not accepted here. Two species of uncertain generic position (*N. cetrariicola* and *N. diversispora*) are provisionally kept here.

Species: 7-0-0. **cetrariicola** (Linds.) Arnold [= *Lecidea cetrariicola* Linds.]: on *Cetraria*; **diversispora** Grélet: on *Lecanora* [a poorly known species]; **doerfeltii** (Alstrup & P.Scholz) Diederich, comb. nov. [= *Phacopsis doerfeltii* Alstrup & P.Scholz]: on *Arctoparmelia centrifuga*; **falcispora** (Triebel & Rambold) Diederich, comb. nov. [= *Ph. falcispora* Triebel & Rambold; = *Ph. falcispora* var. *sipmanii* Diederich & Triebel]: on *Usnea*; **oxyspora** (Tul.) A.Massal. var. **oxyspora** [= *Punctelia oxyspora* (Tul.) Divakar, Crespo, D.Hawksw. & Lumbsch; = *Ph. oxyspora* var. *defecta* Triebel & Rambold; = *Ph. menegazziae* Triebel & Rambold; = *N. rufa* Müll.Arg.]: on Parmeliaceae [populations with reddish to dark brown apothecia and a hyaline to pale brown hypothecium]; **oxyspora** var. **fusca** (Triebel & Rambold) Diederich, comb. nov. [= *N. fusca* (Triebel & Rambold) Pérez-Ortega; = *Ph. oxyspora* var. *fusca* Triebel & Rambold; = *Ph. australis* Aptroot & Triebel]: on *Xanthoparmelia* and other Parmeliaceae [populations with dark brown to black, immersed to superficial apothecia and a brown to dark brown hypothecium]; **thallicola** (A.Massal.) A.Massal. [= *Abrothallus curreyi* Linds.]: on *Flavoparmelia caperata* [type of *N. thallicola*], *Parmotrema* [type of *A. curreyi*], *Cetrelia*, *Flavopunctelia* and *Hypotrachyna*.

Lit.: Aptroot & Triebel 2002; Divakar et al. 2015, 2017; Scholtz 1998; Spribille 2010; Triebel & Rambold 1988; Triebel et al. 1995, Zhurbenko & Hafellner 1999.

Phacopsis Tul.; type: *P. vulpina*. Mol.: yes (T, L).
Species: 6-0-0. **cephalodioides** (Nyl.) Triebel & Rambold: on *Hypogymnia physodes*; **lethariellae** Hafellner & Rambold: on *Lethariella intricata*; **oroarcticae** Zhurb.: on *Brodoa oroarctica*; **prolificans** (Müll.Arg.) Triebel & Rambold: on *Platismatia interrupta*; **usneae** C.W.Dodge: on *Usnea* subgen. *Neuropogon*; **vulpina** Tul.: on *Letharia*.
Lit.: Divakar et al. 2015; Etayo & Sancho 2006; Hafellner 1987a; Triebel & Rambold 1988; Triebel et al. 1995; Zhurbenko 2010b.

Protoparmelia M.Choisy; type: *P. badia* (Hoffm.) Hafellner (lichenized). Mol.: yes (T, L).
Species: 0-7-0 (35). **atriseda** (Fr.) R.Sant. & V.Wirth: lichen, juvenile lichenicolous on *Rhizocarpon*; **cupreobadia** (Nyl.) Poelt: lichen, juvenile lichenicolous on *Rhizocarpon*; **hierrensis** van den Boom & Ertz: lichenicolous lichen on *Pertusaria*; **leproloma** (R.Sant.) Rambold & Poelt: lichenicolous lichen on *Lecidea praenubila*; **loricata** Poelt & Vězda: lichenicolous lichen on *Lecanora umbrosa*; **phaeonesos** Poelt: lichenicolous lichen on *Aspicilia myrini*; **placentiformis** (J.Steiner) Poelt: lichen, juvenile lichenicolous on *Bellemerea cupreolata*.
Lit.: Rambold & Triebel 1992; van den Boom & Ertz 2012.

Raesaenenia D.Hawksw., C.Boluda & H.Lindgren; type: *R. husskonenii*. Mol.: yes (T, L).
Species: 1-0-0. **huuskonenii** (Räsänen) D.Hawksw., C.Boluda & H.Lindgr. [= *Phacopsis huuskonenii* Räsänen; = *Protousnea huuskonenii* (Räsänen) Divakar, Crespo & Lumbsch]: on *Bryoria*.
Lit.: Divakar et al. 2015, 2017; Lindgren et al. 2015; Triebel & Rambold 1988.

Family Pilocarpaceae Zahlbr.

Epicladonia D.Hawksw. s.l.; type: *E. sandstedei*. Mol.: yes (T, L).
The generic type belongs to Leotiomycetes. Both *E. simplex* and *E. stenospora* are not related to the type, but represent a distinct clade in the Pilocarpaceae. More studies are needed before a new genus can be described for them, hence they are provisionally placed here.
Species: 2-0-0. **simplex** D.Hawksw.: on *Cladonia*; **stenospora** (Harmand) D.Hawksw.: on *Cladonia*.
Lit.: Hawksworth 1981; Pino-Bodas et al. 2017.

Fellhanera Vězda; type: *F. fuscata* (Müll.Arg.) Vězda (lichenized). Mol.: yes.
Species: 0-1-0 (100). **stictae** Etayo: lichenicolous lichen on *Sticta*.
Lit.: Etayo 2017.

Micarea Fr.; type: *M. prasina* Fr. (lichenized). Mol.: yes (T, L).
Species: 4-1-0 (100). **inquans** (Tul.) Coppins: on *Dibaeis baeomyces*; **intrusa** (Th.Fr.) Coppins & H.Kilias [= *Carbonea intrusa* (Th.Fr.) Rambold & Triebel; = *Scoliciosporum intrusum* (Th.Fr.) Hafellner]: lichen, frequently lichenicolous on *Rhizocarpon*, *Lecidea* or other saxicolous lichens; **kemmleri** Brackel: on *Cladonia*; **stereocaulorum** Etayo & van den Boom: on *Stereocaulon*; **usneae** van den Boom & Ertz: on *Usnea*.

Lit.: Brackel 2016; Coppins 2009; Etayo 2017; van den Boom & Ertz 2014.

Scutula Tul.; type: *S. wallrothii*, i.e. *S. miliaris* [= *Hollosia* Gyeln.; type: *H. vertescens*, i.e. *S. epiblastematica*; = *Karsteniomyces* D.Hawksw.; type: *K. peltigerae* (P.Karsten) D.Hawksw.; = *Libertiella* Speg. & Roum.; type: *L. malmedyensis* Speg. & Roum., i.e. probably *S. epiblastematica*]. Mol.: yes (T, L).
Species on non-Peltigerales hosts probably do not belong to *Scutula* s.str.

Species: 14-2-0. **cladoniicola** Alstrup & D.Hawksw.: on *Cladonia trassii* [does not belong to *Scutula*]; **curvispora** (D.Hawksw. & Miädl.) Diederich, comb. nov. [= *Libertiella curvispora* D.Hawksw. & Miädl.]: on *Peltigera*; **dedicata** Triebel, Wedin & Rambold: lichenicolous lichen on *Peltigera*; **didymospora** (D.Hawksw. & Miädl.) Diederich, comb. nov. [= *Libertiella didymospora* D.Hawksw. & Miädl.]: on *Peltigera*; **epiblastematica** (Wallr.) Rehm [= *S. aggregata* (Bagl. & Carestia) Rehm; = *Hollosia vertescens* Gyeln.; =? *Orbilina peltigerae* (Fueckel) Sacc.; =? *Libertiella malmedyensis* Speg. & Roum.]: on cyanobacterial *Peltigera* species; **heerii** (Hepp) Trevis.: lichenicolous lichen on *Peltigera*; **Libertiella fennica** Alstrup: on *Peltigera*; **Libertiella leprariae** Etayo & Diederich: on *Lepraria*; **leptogica** (Nyl.) Zopf: on *Polychidium muscicola*; **Karsteniomyces llimonae** Boqueras & Diederich: on *Parmelina quercina*; **miliaris** (Wallr.) Trevis. [= *S. wallrothii* Tul., nom. illeg.; = *Karsteniomyces peltigerae* (P.Karst.) D.Hawksw.; = *Diplodina peltigerae* Vouaux]: on cyanobacterial *Peltigera* species; **nephromatis** (Speg.) Etayo: on *Nephroma antarcticum*; **Libertiella obscurior** Gerber: on *Brodoa intestiniformis* [a poorly known species]; **pseudocypbellariae** Etayo & Triebel: on *Pseudocypbellaria*; **tuberculosa** (Th.Fr.) Rehm [= *S. krempehuberi* Körb.; = *S. solorinaria* (Nyl.) P.Karst.; = *S. solorincola* (Vain.) Rehm]: on *Solorina*; **Karsteniomyces tuberculatus** Alstrup & D.Hawksw.: on green-algal *Peltigera* species [probably distinct from *S. epiblastematica*].

Lit.: Alstrup 1997; Alstrup & Hawksworth 1990; Boqueras & Diederich 1993; Etayo & Diederich 1995; Etayo & Sancho 2008; Etayo & Triebel 2010; Hawksworth 1980b, 1981; Hawksworth & Miädlíkowska 1997a; Pino-Bodas et al. 2017; Triebel et al. 1997; Wedin et al. 2007.

Family Psoraceae Zahlbr.

Glyphopeltis Brusse; type: *G. eburina*, i.e. *G. ligustica*. Mol.: yes (T, L).
Species: 0-1-0. **ligustica** (B. de Lesd.) Timdal [= *G. eburina* Brusse]: lichen, juvenile parasite on *Peltula*.
Lit.: Ott & Scheidegger 1992; Rambold & Triebel 1992.

Psorula Gotth.Schneid.; type: *P. rufonigra*. Mol.: yes (T, L).
Species: 0-1-0 (3). **rufonigra** (Tuck.) Gotth.Schneid.: lichenicolous lichen on *Spilonema*.
Lit.: Rambold & Triebel 1992.

Family Ramalinaceae C.Agardh.

Bacidia De Not.; type: *B. rosella* (Pers.) De Not. (lichenized). Mol.: yes (T).
Species: 1-0-0 (230). **killiasii** (Hepp) D.Hawksw.: on *Peltigera*.
Lit.: Rambold & Triebel 1992.

Myrionora R.C.Harris; type: *S. albidula* (Willey) R.C.Harris (lichenized). Mol.: no.
Species: 0-1-0 (2). **pseudocyphellariae** (Etayo) S.Ekman & Palice [= *Scoliciosporum pseudocyphellariae* Etayo]: lichenicolous lichen on *Pseudocyphellaria*.
Lit.: Etayo & Sancho 2008; Palice et al. 2013.

Toninia A.Massal.; type: *T. cinereovirens* (Schaer.) A.Massal. (lichenized). Mol.: yes (T, L).
Species: 11-3-0 (85). **collematicola** Timdal: on *Collema*; **episema** (Nyl.) Timdal [=? *Scutula aspiciliae* (Müll.Arg.) Rehm]: on *Aspicilia*; **leptogii** Timdal: on *Collema* and *Leptogium*; **nashii** Timdal: on *Lecidella asema* (and *Lecanora gangaleoides*?); **nordlandica** Th.Fr.: lichenicolous lichen on *Placynthium* and other lichens with cyanobacteria; **plumbina** (Anzi) Hafellner & Timdal: on *Degelia*; **poeltiana** S.Y.Kondr., L.Lökös & J.-S.Hur: on *Verrucaria fuscella*; **subfuscae** (Arnold) Timdal: on *Lecanora*, rarely on other lichens; **subdispersa** (Hasse) K.Knudsen [= *T. talparum* Timdal]: on *Lecania*; **subtalparum** van den Boom: on *Lecania*; **tecta** C.A.Morse & Ladd: on *Dermatocarpon*; **ualae** Etayo: lichenicolous lichen on *Pseudocyphellaria* and *Nephroma antarcticum*; **verrucariae** (Nyl.) Timdal: on *Bagliettoa* and *Encephalographa elisae*; **verrucarioides** (Nyl.) Timdal: lichenicolous lichen on *Placynthium*.
Lit.: Etayo & Sancho 2008; Knudsen & Lendemer 2007; Knudsen & Kocourková 2018; Kondratyuk et al. 2016b; Ladd & Morse 2018; Rambold & Triebel 1992; Timdal 1992; van den Boom 2004.

Family **Ramboldiaceae** S.Stenroos, Miqdl. & Lutzoni

Ramboldia Kantvilas & Elix; type: *R. stuartii* (Hampe) Kantvilas & Elix (lichenized). Mol.: yes (T, L).
Species: 0-1-0 (30). **insidiosa** (Th.Fr.) Hafellner: lichenicolous lichen on *Lecanora varia*.
Lit.: Hafellner & Türk 1995.

Family **Scoliciosporaceae** Hafellner

Scoliciosporum A.Massal.; type: *S. holomelaenum* (Flörke) A.Massal. (lichenized). Mol.: no.
Species: 0-1-0 (13). **vouauxii** (B. de Lesd.) Hafellner: lichenicolous lichen on *Ramalina*.
Lit.: Hafellner 2002, 2004b.

Family **Stereocaulaceae** Chevall.

Paralecia Brackel, Greiner, Peršoh & Rambold; type: *P. pratorum*. Mol.: yes (T, L).
Species: 1-0-0. **pratorum** Brackel, Greiner, Peršoh & Rambold: on *Protoparmeliopsis muralis*.
Lit.: Liu et al. 2015.

Family **Tephromelataceae** Hafellner [= Mycoblastaceae Hafellner]

Tephromela M.Choisy; type: *T. atra* (Huds.) Hafellner (lichenized). Mol.: yes (T).
Species: 3-1-0 (30). **campestricola** (Nyl.) Rambold & Triebel: on *Lecanora pseudistera* and *L. sp.*; **cerasina**

(Müll.Arg.) Rambold & Triebel: on *Dirinaria*; **koliensis** (Räs.) Rambold & Triebel: on *Lecanora argopholis*; **parasitica** Øvstedal & Søchting: lichenicolous lichen on *Lecidella*.
Lit.: Rambold 1993; Søchting et al. 2004.

Order Lecanorales genera incertae sedis

Corticruptor Wedin & Hafellner; type: *C. abeloniae*. Mol.: yes.
Species: 2-0-0. **abeloneae** (P.M.Jørg.) Wedin & Hafellner: on *Sticta*; **corallinus** Etayo: on *Pseudocyphellaria*.
Lit.: Etayo & Sancho 2008; Wedin & Hafellner 1998.

Lichenosticta Zopf; type: *L. podetiicola*, i.e. *L. alcorniaria*. Mol.: yes (T, L).
Species: 5-0-0. **alcorniaria** (Linds.) D.Hawksw. [= *L. podetiicola* Zopf]: on *Cladonia*; **dombrovskae** Zhurb.: on *Stereocaulon*; **hoegnabbae** Zhurb. & Pino-Bodas: on *Cladia*; **jurgae** Kukwa & Flakus: on *Lecanora*; **lecanorae** (Vouaux) Brackel & Zhurb.: on *Lecanora*.
Lit.: Flakus & Kukwa 2012; Hawksworth 1981; Pino-Bodas et al. 2017; Zhurbenko 2010a; Zhurbenko & Pino-Bodas 2015; Zhurbenko et al. 2015a.

Nimisiostella Calat., Barreno & O.E.Erikss.; type: *N. lichenicola*. Mol.: yes.
Species: 1-0-0. **lichenicola** Calat., Barreno & O.E.Erikss.: on *Parmelia saxatilis*.
Lit.: Calatayud et al. 1997.

Umbilithecium Etayo; type: *U. pseudocyphellariae*. Mol.: yes.
Species: 1-0-0. **pseudocyphellariae** Etayo: on *Pseudocyphellaria*.
Lit.: Etayo & Sancho 2008.

Umushamyces Etayo; type: *U. kuturnus*. Mol.: yes.
Species: 1-0-0. **kuturnus** Etayo: on *Cocotrema cucurbitula*.
Lit.: Etayo & Sancho 2008.

Order Lecideales Vain.

Family **Lecideaceae** Chevall.

Bellemeria Hafellner & Cl.Roux; type: *B. alpina* (Sommerf.) Clauzade & Cl.Roux (lichenized). Mol.: yes (T).
Species: 0-1-0 (9). **cupreoatra** (Nyl.) Clauzade & Cl.Roux: lichenicolous lichen on *Buellia*, becoming independent.
Lit.: Rambold & Triebel 1992.

Cecidonia Triebel & Rambold; type: *C. umbonella*. Mol.: yes (T, L).
Species: 2-0-0. **umbonella** (Nyl.) Triebel & Rambold: on *Lecidea*; **xenophana** (Körb.) Triebel & Rambold [= *Lecidea hymeneliicola* Alstrup & D.Hawksw.]: on *Porpidia*.
Lit.: Triebel & Rambold 1988.

Immersaria Rambold & Pietschm.; type: *I. athroocarpa*. Mol.: yes (L).
Species: 0-3-0 (8). **athroocarpa** (Ach.) Rambold & Pietschm.: lichen, juvenile facultatively lichenicolous on *Aspicila* and other lichens; **cupreoatra** (Nyl.) Calat. & Rambold: lichen, juvenile lichenicolous on *Buellia*; **usbekica** (Hertel) Barbero,

Nav.-Ros. & Cl.Roux: lichen, juvenile facultatively lichenicolous on *Aspicilia* and other lichens.
Lit.: Rambold & Triebel 1992.

Lecidea Ach. s.l.; type: *L. fuscoatra* (L.) Ach. (lichenized). Mol.: yes (T).
Species: 4-6-0 (100). **acervata** Stiz.: on *Pseudoparmelia* [a poorly known taxon]; **degeliana** Hertel: lichenicolous lichen on *Acarospora*; **diexcipula** D.Hawksw. & Alstrup: on *Lecanora polytropia*; **grummannii** Hertel: lichenicolous lichen on *Acarospora*; **halacsi** J.Steiner: on *Rhizocarpon geographicum*; **leprosolimbata** (Arnold) Poelt: lichenicolous lichen on *Bellemerea subcandida*; **percutiens** Poelt: lichenicolous lichen on *Diploschistes scruposus*; **perforans** Stiz.: on *Parmotrema* [a poorly known taxon]; **rapax** Hertel: lichenicolous lichen on *Aspicilia* and *Bellemerea*; **verruca** Poelt: lichenicolous lichen on *Aspicilia*.
Lit.: Hafellner 2006; Rambold & Triebel 1992.

Poeltiaria Hertel; type: *P. turgescens* (Körb.) Hertel (lichenized). Mol.: yes.
Species: 0-1-0 (8). **coromandelica** (Zahlbr.) Rambold & Hertel: lichen, juvenile lichenicolous on *Parapordia leptocarpa*.
Lit.: Rambold & Triebel 1992.

Order Leprocaulales Lendemer & B.P.Hodk.

Family Leprocaulaceae Lendemer & B.P.Hodk.

Halecania M.Mayrhofer; type: *H. alpivaga*. Mol.: yes (T, L).
Species: 1-5-0 (22). **alpivaga** (Th.Fr.) M.Mayrhofer: lichenicolous lichen on *Physcia* and *Placynthium*; **fuscopannariae** Etayo & van den Boom: on *Fuscopannaria*; **giraltiae** van den Boom & Etayo: lichenicolous lichen on saxicolous lichens; **lobulata** van den Boom & Elix: lichen, possibly lichenicolous over *Hymenelia*; **parasitica** Aptroot & K.H.Moon: lichenicolous lichen over *Schaereria fuscocinerea*, becoming independent; **santessonii** Andreev: lichenicolous lichen on *Porpidia albocaerulescens*.
Lit.: Andreev 2010; Aptroot & Moon 2015; M. Mayrhofer 1987; van den Boom 2009; van den Boom & Elix 2005; van den Boom & Etayo 2001.

Order Rhizocarpales Miądl. & Lutzoni s.l.

Family Rhizocarpaceae Hafellner

Epilichen Clem.; type: *E. scabrosus*. Mol.: no.
Species: 1-2-0. **glaucinigellus** (Nyl.) Hafellner: lichenicolous lichen on *Baeomyces*; **scabrosus** (Ach.) Clements: lichenicolous lichen on *Baeomyces*; **stellatus** Triebel: on *Lecidea cf. tessellata*.
Lit.: Hafellner 1978; Triebel 1989.

Rhizocarpon DC.; type: *R. geographicum* (L.) DC. (lichenized). Mol.: yes (T, L).
Species: 7-32-0 (225). **advenulum** (Leight.) Hafellner & Poelt: on *Pertusaria flavicans* and *P. rupicola*; **asiaticum** (Poelt) Poelt: lichenicolous lichen on *Sporastatia*; **aspiciliae** (Räsänen) D.Hawksw. & V.Atienza: on *Hymenelia*; **atrovirillum** (Nyl.) Zahlbr.: lichenicolous lichen on *Aspicilia*;

bryontheae Poelt: on *Pertusaria bryonthea*; **captans** Poelt: lichenicolous lichen on *Aspicilia*; **cleptophilum** Alstrup & E.S.Hansen: lichenicolous lichen on *Acarospora picea*; **dahlia** Øvstedal: lichenicolous lichen on the prothallus of *Rhizocarpon geographicum*; **destructans** Alstrup: lichenicolous lichen on *Lecanora polytropia*; **dimelaena** Timdal: lichenicolous lichen on *Dimelaena oreina*; **dinothetes** Hertel & Leuckert: lichenicolous lichen on *Protoparmelia*; **diploschistidina** McCune: lichenicolous lichen on *Diploschistes muscorum*; **effiguratum** (Anzi) Th.Fr.: facultatively lichenicolous lichen on *Pleopsidium flavum*; **episilum** (Nyl.) Zahlbr. s.l.: lichenicolous lichen on saxicolous *Pertusaria*; **fratricida** Poelt & Nimis: lichenicolous lichen on *Rhizocarpon*; **fuegianum** Poelt, nom. nud.: lichenicolous lichen on *Rhizocarpon geographicum*; **furax** Poelt & V.Wirth: lichenicolous lichen on *Lecidea*; **inimicum** Poelt & Vězda: lichenicolous lichen on *Lecanora rupicola* s.l.; **intermediellum** Räsänen: lichen, juvenile lichenicolous on other lichens; **kakurgon** Poelt: lichenicolous lichen on *Aspicilia*; **kansuense** H.Magn.: lichenicolous lichen on *Aspicilia*; **lusitanicum** (Nyl.) Arnold: lichenicolous lichen on saxicolous *Lepra*; **malenconianum** (Llimona & Werner) Hafellner & H.Mayrhofer: on *Diploschistes*; **mosigiae** Poelt & Obermayer: lichenicolous lichen on *Rimularia gibbosa*; **narssaqense** Alstrup: on *Lecanora atomarginata*; **norvegicum** Räsänen: lichen, juvenile lichenicolous on other lichens, mainly *Acarospora*; **ochrolechia** (Poelt & Nimis) Hafellner: on *Ochrolechia parella*; **parvum** Runem.: lichen, juvenile lichenicolous on *Tremolecia atrata*; **pusillum** Runem.: lichenicolous lichen on *Sporastatia*; **rapax** V.Wirth & Poelt: lichenicolous lichen on *Acarospora*, *Aspicilia* and *Rimularia*; **renneri** Poelt: lichenicolous lichen on *Dimelaena oreina*; **santessonii** Timdal: lichenicolous lichen on *Tremolecia atrata*; **shedomyces** Hafellner & Poelt: lichenicolous lichen on saxicolous *Pertusaria*; **subtile** Runem.: lichen, juvenile lichenicolous on *Tremolecia*; **superficiale** (Schaer.) Vain.: lichen, juvenile lichenicolous on *Acarospora oxytona*; **tephromelae** Øvstedal: lichenicolous lichen on *Tephromela atra*; **trapeliicola** Brand: lichenicolous lichen on *Trapelia*; **tungurahuae** Etayo & Palice: on *Gyalidea*; **viridiatrum** (Wulf.) Körb.: lichen, juvenile often lichenicolous on *Aspicilia*, *Lecidea*, *Tremolecia*; **vorax** Poelt & Hafellner: lichenicolous lichen on *Ochrolechia parella* and *Pertusaria*.

Lit.: Alstrup & Hawksworth 1990; Etayo 2017; Feuerer & Timdal 2004; Hawksworth & Atienza 1994; Holtan-Hartwig & Timdal 1987; Lumbsch et al. 2011; Øvstedal et al. 2009; Poelt & Obermayer 1995; Poelt & Vězda 1984; Rambold & Triebel 1992.

Order Teloschistales D.Hawksw. & O.E.Erikss.

Family Teloschistaceae Zahlbr.

Subfamily Caloplacoideae Arup, Søchting & Frödén

Caloplaca Th.Fr. s.l.; type: *C. cerina* (Hedw.) Th.Fr. (lichenized). Mol.: yes (T, L). We also include here species belonging to *Caloplaca* s.l. for which no molecular data are available.
Species: 0-26-0 (350). **adelphoparasitica** Nimis & Poelt: lichenicolous lichen on *Caloplaca* and other lichens; **anchon-phoeniceon** Poelt & Clauzade: lichenicolous lichen on *Aspicilia*; **cacuminum** Poelt: lichen, juvenile facultatively lichenicolous on saxicolous lichens; **emilii** Vondrák,

Khodos., Cl.Roux & V.Wirth: lichen, juvenile lichenicolous on saxicolous lichens; *epierodens* M.Bertrand & Cl.Roux: lichenicolous lichen on *Pyrenodesmia erodens*; *epithallina* Lyngé: lichenicolous lichen on *Acarospora*, *Aspicilia*, *Dime-laena*, *Lecanora*, *Melanelia*, *Pleopsidium*, *Psorinia*, *Rhizocarpon*, *Rhizoplaca*, *Stereocaulon*, *Tephromela*, *Umbilicaria*; *epitoninia* O.Breuss: lichenicolous lichen on *Toninia aromatica*; *erythrocarpa* (Pers.) Zwackh: lichen, juvenile facultatively lichenicolous on *Aspicilia calcarea*; *furax* Egea & Llimona: lichen, juvenile lichenicolous on other lichens, especially *Aspicilia*; *grimmiae* (Nyl.) H.Olivier: lichenicolous lichen on *Candelariella*; *inconnexa* (Nyl.) Zahlbr. var. *inconnexa*: lichen, juvenile lichenicolous on *Acarospora*, *Aspicilia*, *Caloplaca*; *inconnexa* var. *nesodes* Poelt & Nimis: lichenicolous lichen on *Aspicilia*; *infestans* H.Magn.: lichenicolous lichen on *Aspicilia*, *Caloplaca* s.l., *Lecanora*; *insularis* Poelt: lichenicolous lichen on *Aspicilia*; *interna* Poelt & Nimis: lichenicolous lichen on *Aspicilia*; *isidiigera* Vězda: lichenicolous lichen on saxicolous lichens; *lecanorae* F.C.Seavey & J.L.Seavey: lichenicolous lichen on *Lecanora leprosa*; *magni-filii* Poelt: lichenicolous lichen on *Miriquidica nigroleprosa*; *megalariicola* Øvstedal: lichenicolous lichen on *Megalaria grossa*; *necator* Clauzade & Poelt: lichenicolous lichen on *Aspicilia*; *nubigena* (Kremp.) Dalla Torre & Sarth.: lichen, facultatively lichenicolous on *Clauzadea immersa*; *peludella* (Nyl.) Hasse: lichen, juvenile facultatively lichenicolous on saxicolous lichens; *placidia* (A.Massa.) J.Steiner: lichen, juvenile facultatively lichenicolous on *Pyrenodesmia chalybaea*; *psoricida* Hansen, Poelt & Søchting: lichenicolous lichen on *Psora rubiformis*; *rinodinae-albae* Poelt & Nimis: lichenicolous lichen on *Rinodina alba*; *tenuatula* (Nyl.) Zahlbr.: lichenicolous lichen on *Bagliettoa calciseda*.
Lit.: Breuss 1990; Fryday & Øvstedal 2012; Nimis et al. 1994; Rambold & Triebel 1992; Roux 2014; Seavey & Seavey 2012; Wetmore 1999.

Gyalolechia A.Massal.; type: *G. aurea* (Schaer.) A.Massal (lichenized) [= *Fulgensia* A.Massal. & De Not.; type: *F. fulgens* (Sw.) Elenkin (lichenized)]. Mol.: yes (T).
Species: 0-1-0 (30). *epiplacynthium* (Etayo) Diederich, comb. nov. [= *Fulgensia epiplacynthium* Etayo]: lichenicolous lichen on *Placynthium filiforme*.
Lit.: Etayo 2010c.

Variospora Arup, Søchting & Frödén; type: *V. velana*. Mol.: yes (T, L).
Species: 0-1-0 (12). *velana* (A.Massal.) Arup, Søchting & Frödén: lichen, juvenile facultatively lichenicolous on *Pyrenodesmia variabilis*.
Lit.: Roux 2014.

Subfamily Teloschistoideae Arup, Søchting & Frödén

Catenarina Søchting, Søgaard, Arup, Elvebakk & Elix; type: *C. desolata*. Mol.: yes (T, L).
Species: 0-1-0 (3). *desolata* Søchting, Søgaard & Elvebakk: lichenicolous lichen on *Aspicilia*.
Lit.: Søchting et al. 2014.

Sirenophila Arup, Søchting & Frödén; type: *S. gintarasii* (S.Y.Kondr. & Kärnefelt) Arup, Frödén & Søchting. Mol.: yes (T).

Species: 0-1-0 (8). *ovis-atra* Søchting, Søgaard & Sancho: lichenicolous lichen on *Hydropunctaria*.
Lit.: Søchting et al. 2016.

Subfamily Xanthorioideae Arup, Søchting & Frödén

Flavoplaca Arup, Søchting & Frödén; type: *F. citrina* (Hoffm.) Arup, Søchting & Frödén. Mol.: yes (T).
Species: 0-4-0 (27). *coronata* (Körb.) J.Steiner: lichen, juvenile facultatively lichenicolous on saxicolous lichens; *microthallina* (Wedd.) Zahlbr.: lichen, facultatively lichenicolous on saxicolous lichens, especially *Hydropunctaria maura*; *oasis* (A.Massal.) Szatala: lichen, facultatively lichenicolous on saxicolous lichens, especially *Bagliettoa calciseda*; *polycarpa* (A.Massal.) Arup, Frödén & Søchting: lichenicolous lichen on *Bagliettoa*.
Lit.: Arup et al. 2013, Roux 2014.

Pachypeltis Søchting, Arup & Frödén [a hemihomonym of *Pachypeltis* Signoret (Heteroptera)]; type: *P. castellana* (Räsänen) Søchting, Frödén & Arup (lichenized). Mol.: yes (T, L).
Species: 0-1-0 (4). *invadens* (Lyngé) Søchting, Frödén & Arup: lichenicolous lichen on *Lecanora*, *Physcia caesia*.
Lit.: Arup et al. 2013.

Shackletonia Søchting, Frödén & Arup; type: *S. hertelii* (Søchting, Øvstedal & Sancho) Søchting, Frödén & Arup (lichenized). Mol.: yes (T, L).
Species: 1-2-0 (5). *buelliae* (Olech & Søchting) Søchting: on *Buellia*; *Caloplaca psoromatis* Olech & Søchting: lichenicolous lichen on *Psoroma* and *Pannaria hookeri* [provisionally placed here]; *sauroonii* (Søchting & Øvstedal) Søchting: lichenicolous lichen on *Buellia*.
Lit.: Garrido-Benavent et al. 2016; Olech & Søchting 1993; Søchting et al. 2004.

Subclass OSTROPOMYCETIDAE Reeb, Lutzoni & Cl.Roux

Order Ostropales Nannf.

Family Gomphillaceae Walt.Watson

Corticifraga D.Hawksw. & R.Sant.; type: *C. peltigerae*. Mol.: yes (T, L).
Species: 7-0-0. *chugachiana* Zhurb.: on *Lobaria oregana*; *fuckelii* (Rehm) D.Hawksw. & R.Sant.: on *Peltigera*; *fusispora* Zhurb.: on *Peltigera aphthosa* and *P. leucophlebia*; *peltigerae* (Fuckel) D.Hawksw. & R.Sant.: on *Peltigera*, exceptionally on *Solorina* and *Pseudocyphellaria*; *pseudocyphellariae* Etayo: on *Pseudocyphellaria*; *santessonii* Zhurb. & Zavarzin: on *Lobaria* and *Nephroma*; *scrobiculatae* Pérez-Ortega: on *Lobarina scrobiculata*.
Lit.: Etayo & Sancho 2008; Hawksworth & Santesson 1990; Pino-Bodas et al. 2017; Spribille et al. 2010; Zhurbenko 2007c; Zhurbenko 2009b.

Gyalideopsis Vězda; type: *G. peruviana* Vězda (lichenized). Mol.: yes.
Species: 4-0-1 (91). *cochlearifer* Lücking & Sérus.: on foliicolous Gomphillaceae; *epithallina* R.Lücking: on foliicolous

olous *Gyalideopsis vulgaris*; **parvula** Kalb & Vězda: on foliicolous Pilocarpaceae; **stipitata** Kalb & Vězda: facultatively lichenicolous on *Dictyonema*; **usneicola** Etayo: on *Usnea*.
Lit.: Etayo 2010b, 2017; Lücking 1997; Lücking & Sérusiaux 1998.

Paragyalideopsis Etayo; type: *P. floridae*. Mol.: no.
Species: 4-0-0. **breussii** Etayo: on *Hypotrachyna*; **floridae** (Etayo & Diederich) Etayo: on *Parmotrema*; **minuta** Etayo: on *Trypethelium*; **stereocaulicola** (Etayo) Etayo: on *Stereocaulon*.
Lit.: Etayo 2017; Etayo & Diederich 2001.

Taitaia Suija, Kaasalainen, Kirika & Rikkinen; type: *T. aurea*.
Mol.: yes (T, L).
Species: 1-0-0. **aurea** Suija, Kaasalainen & Rikkinen: on *Crocodia* cf. *clathrata*.
Lit.: Suija et al. 2018b.

Family Graphidaceae Dumort.

Subfamily Graphidoideae Rivas Plata, Lücking & Lumbsch

Diploschistes Norman; type: *D. scruposus* (Schreb.) Norman (lichenized). Mol.: yes (T, L).
Species: 0-4-0 (31). **bisporus** (Bagl.) J.Steiner: lichen, facultatively lichenicolous on *Rhizocarpon geographicum* s.l.; **caesioplumbeus** (Nyl.) Vainio: lichen, juvenile lichenicolous on *Lecanora gangaleoides*; **euganeus** (A.Massal.) J.Steiner: lichen, facultatively lichenicolous on *Ochrolechia parella*; **muscorum** (Scop.) R.Sant.: lichenicolous on *Cladonia* (rarely *Stereocaulon*) when young, later an independent lichen.
Lit.: Lumbsch 1989.

Family Protothelenellaceae Vězda, H.Mayrhofer & Poelt

Protothelenella Räsänen; type: *P. reducta* (Th.Fr.) Räsänen, i.e. *P. sphinctrinoidella* (Nyl.) H.Mayrhofer & Poelt (lichenized). Mol.: yes (T, L).
Species: 3-0-3 (11). **croceae** (Bagl. & Car.) Hafellner & H.Mayrhofer: on *Solorina crocea*, more rarely *Peltigera*; **leucothelia** (Nyl.) H.Mayrhofer & Poelt: facultatively lichenicolous on moribund lichens, especially *Cladonia*; **pseudocypbellariae** Etayo: on *Pseudocypbellaria*; **santessonii** H.Mayrhofer: on *Cladonia*; **sphinctrinoidella** (Nyl.) H.Mayrhofer & Poelt: facultatively lichenicolous on *Cladonia*, *Peltigera* and *Stereocaulon*; **sphinctrinoides** (Nyl.) H.Mayrhofer & Poelt: facultatively lichenicolous on *Peltigera* and *Solorina*.
Lit.: Etayo & Sancho 2008; H. Mayrhofer 1987; Pino-Bodas et al. 2017.

Family Stictidaceae Fr.

Cryptodiscus Corda; type: *C. pallidus* [= *Lettauia* D.Hawksw. & R.Sant.; type: *L. cladoniicola*]. Mol.: yes (T, L).
Species: 3-0-0 (9). **cladoniicola** (D.Hawksw. & R.Sant.) Pino-Bodas, Zhurb. & S.Stenroos [= *Lettauia cladoniicola* D.Hawksw. & R.Sant.]: on *Cladonia*; **epicladonia** Zhurb. &

Pino-Bodas: on *Cladonia*; **galaninae** Zhurb. & Pino-Bodas: on *Cladonia*.
Lit.: Hawksworth & Santesson 1990; Pino-Bodas et al. 2017.

Lettauia D.Hawksw. & R.Sant. s.l.; type: *L. cladoniicola*, i.e. *Cryptodiscus cladoniicola*. Mol.: no. The generic type has recently been shown to belong to *Cryptodiscus*. The phylogenetic affinities of the three other species described in *Lettauia* are currently unknown.
Species: 3-0-0. **hypotrachynae** Etayo: on *Hypotrachyna*; **santessonii** Ihlen & Tønberg: on *Loxospora pustulata*; **usneae** Etayo: on *Usnea*.
Lit.: Etayo 2002, 2017; Ihlen & Tønberg 1996.

Nanostictis M.S.Christ.; type: *N. peltigerae*. Mol.: no.
Species: 9-0-0. **caucasica** Zhurb.: on *Parmelia sulcata*; **christiansenii** Etayo: on *Lobaria pulmonaria*; **confusa** Etayo: on *Hypotrachyna*; **heterodermiae** Etayo & Sipman: on *Heterodermia*; **nephromatis** Etayo: on *Nephroma antarcticum*; **peltigerae** M.S.Christ.: on *Peltigera*; **pluriseptata** Etayo: on *Lobariella* gr. *pallida*; **pseudocypbellariae** Sherwood: on *Pseudocypbellaria*; **stictae** Etayo: on *Sticta*.
Lit.: Etayo 2002a, 2017; Etayo & Diederich 1996b; Etayo & Sancho 2008; Zhurbenko 2017.

Sphaeropezia Sacc.; type: *S. alpina* Sacc. [= *Lethariicola* Grummann; type: *L. sipei*]. Mol.: yes (L).
Species: 16-0-0 (19). **bryoriae** (Diederich & Etayo) Baloch & Wedin [= *Odontotrema bryoriae* Diederich & Etayo]: on *Bryoria*; **cucularis** (Norman) Baloch & Wedin: on *Parmeliopsis*; **figulina** (Norman) Baloch & Wedin: on *Lecanora polytropha*; **intermedia** (Diederich, Zhurb. & Etayo) Baloch & Wedin [= *O. intermedium* Diederich, Zhurb. & Etayo]: on *Thamnolia*; **japewiae** (Zhurb. & Diederich) Baloch & Wedin [= *O. japewiae* Zhurb. & Diederich]: on *Japewia tornoënsis*; **lecanorae** (Diederich & G.Marson) Baloch & Wedin [= *O. lecanorae* Diederich & G.Marson]: on *Lecanora*; **melaneliae** (Diederich & Zhurb.) Baloch, Gilenstam & Wedin [= *O. melaneliae* Diederich & Zhurb.]: on *Melanelia hepatizon* and *Melanohalea olivacea*; **mycoblasti** Diederich, Baloch & Wedin: on *Mycoblastus*; **navarinoi** (Etayo) Baloch & Wedin [= *O. navarinoi* Etayo]: on *Micarea magellanica*; **ochrolechia** (Diederich, Holien & Zhurb.) Baloch & Wedin [= *O. ochrolechia* Diederich, Holien & Zhurb.]: on *Ochrolechia*; **pertusariae** (Etayo, Diederich & Coppins) Baloch & Wedin [= *O. pertusariae* Etayo, Diederich & Coppins]: on *Pertusaria hymenea*; **rhizocarpicola** (Zhurb., Diederich & Himelbrant) Baloch & Wedin [= *O. rhizocarpicola* Zhurb., Diederich & Himelbr.]: on *Rhizocarpon* gr. *geographicum*; **santessonii** (Zhurb., Etayo & Diederich) Baloch & Wedin [= *O. santessonii* Zhurb., Etayo & Diederich]: on *Thamnolia*; **sipei** (Grummann) Baloch & Wedin [= *Lethariicola sipei* Grummann]: on *Letharia*; **Odontotrema stereocaulicola** Zhurb.: on *Stereocaulon* [provisionally placed here; probably does not belong to *Sphaeropezia*]; **thamnoliae** (Zhurb., Diederich & Etayo) Baloch & Wedin [= *O. thamnoliae* Zhurb., Diederich & Etayo]: on *Thamnolia*.
Lit.: Baloch et al. 2013; Diederich et al. 2002b; Etayo & Sancho 2008; Zhurbenko 2009b, 2010a.

Stictis Pers.; type: *S. radiata* (L.) Pers. Mol.: yes (T). The only lichenicolous species probably does not belong to *Stictis*.
Species: 1-0-0 (4). **cladoniae** (Rehm) Sacc.: on *Cladonia*.
Lit.: Pino-Bodas et al. 2017; Sherwood 1977.

Order **Ostropales** genera incertae sedis**Aabaarnia** Diederich; type: *A. siphulicola*. Mol.: no.

Species: 1-0-0. **siphulicola** Diederich: on *Siphula decumbens*.

Lit.: Diederich 2014.

Biazrovia Zhurb. & Etayo; type: *B. stereocaulicola*. Mol.: no.

Species: 1-0-0. **stereocaulicola** Zhurb. & Etayo: on *Stereocaulon*.

Lit.: Zhurbenko & Etayo 2013.

Normanogalla Diederich; type: *N. cribriformis*. Mol.: no.

Species: 1-0-0. **cribriformis** (Norman) Diederich [= *Unguiculariopsis cribriformis* (Norman) Alstrup & D.Hawksw.]: on *Lepra dactylina* and *Pertusaria oculata*.

Lit.: Alstrup & Hawksworth 1990; Diederich 2014.

Paraetharicola Calat., Etayo & Diederich; type: *P. aspiciliae*. Mol.: no.

Species: 1-0-0. **aspiciliae** Calat., Etayo & Diederich: on *Aspicilia*.

Lit.: Calatayud et al. 2001a.

Spirographa Zahlbr.; type: *S. fusisporella* [= *Graphinella* Zahlbr.; type: *G. fusisporella*; = *Pleospilis* Clem.; type: *P. vermiformis* (Leight.) Clem.; = *Spilomela* (Sacc.) Keissl.; type: *S. vermifera* (Leight.) Keissl.; = *Spirographomyces* Cif. & Tomas.; type: *S. spiralis* Cif. & Tomas.]. Mol.: no. No new combinations are proposed here, as a taxonomic revision of the genus is still missing.

Species: 5-0-0. **Lecidea ascaridiella** Nyl. [= *Pleospilis ascaridiella* (Nyl.) D.Hawksw.]: on ?*Porpidia*; **fusisporella** (Nyl.) Zahlbr. [= *Graphinella fusisporella* (Nyl.) Zahlbr.; =? *Opegrapha spiralis* Müll.Arg.]: on Graphidaceae; **longispora** Etayo: on *Sticta*; **usneae** Flakus, Kukwa & Etayo: on *Usnea*; **Melaspilea vermiformis** Leight. [= *Melaspilea vermifera* Leight., nom. illeg.]: on *Lepra albescens*.

Lit.: Diederich 2004; Etayo 2017; Flakus & Kukwa 2012; Sherwood-Pike 1987.

Order **Pertusariales** D.Hawksw. & O.E.Erikss.Family **Megasporaceae** Lumbsch, Feige & K.Schmitz**Aspicilia** A.Massal.; type: *A. cinerea* (L.) Körb. (lichenized). Mol.: yes (T).

Species: 0-1-0 (200). **parasitica** B. de Lesd.: lichenicolous lichen on saxicolous, crustose lichens.

Lit.: Rambold & Triebel 1992.

Family **Microcaliciaceae** Tibell**Microcalicium** Vain.; type: *M. disseminatum*. Mol.: yes (T, L).

Species: 3-0-0 (4). **arenarium** (A.Massal.) Tibell: on *Psilolechia*; **conversum** Tibell: on *Calicium* and *Chaenotheca*; **disseminatum** (Ach.) Vain.: on *Calicium* and *Chaenotheca*, rarely on free living algae.

Lit.: Clauzade et al. 1989; Hawksworth 1981; Prieto et al. 2013; Tibell 1978.

Order **Sarrameanales** B.P.Hodk. & LendemerFamily **Schaereriaceae** Hafellner**Schaereria** Th.Fr.; type: *S. lugubris* (Fr.) Körb. [= *Hafellnera* Houmeau & Cl.Roux; type: *H. parasemella*]. Mol.: yes.

Species: 0-1-0 (16). **parasemella** (Nyl.) Lumbsch [= *Hafellnera parasemella* (Nyl.) Houmeau & Cl.Roux]: lichenicolous lichen on *Biatora vernalis*.

Lit.: Houmeau & Roux 1984; Rambold & Triebel 1992.

Order **Trapeliales** B.P.Hodk. & LendemerFamily **Xylographaceae** Tuck.**Lambiella** Hertel; type: *L. psephota* (Tuck.) Hertel (lichenized). Mol.: yes (T, L).

Species: 0-2-0 (12). **furvella** (Mudd) M.Westb. & Resl: lichenicolous lichen on various lichens; **insularis** (Nyl.) T.Sprib.: lichenicolous lichen on *Lecanora rupicola*.

Lit.: Rambold & Triebel 1992.

Subclass Ostropomycetidae familia incertae sedis

Family **Epigloeaceae** Zahlbr.**Epigloea** Zukal; type: *E. bactrospora* Zukal (algalicolous). Mol.: yes.

Species: 1-0-0 (13). **urosperma** Döbbeler: on *Placynthiella*.

Lit.: Döbbeler 1994.

Subclass Ostropomycetidae genus incertae sedis

Bachmanniomyces D.Hawksw.; type: *B. uncialicola* [= *Phaeopyxis* Rambold & Triebel; type: *P. punctum*]. Mol.: yes (T, L).

Species: 6-0-0 (7). **australis** (Rambold & Triebel) Diederich & Pino-Bodas, comb. nov. [= *Phaeopyxis australis* Rambold & Triebel]: on *Paraporpidia*; **muscigenae** (Alstrup & E.S.Hansen) Diederich & Pino-Bodas, comb. nov. [= *P. muscigenae* Alstrup & E.S.Hansen]: on *Physconia*; **pseudocypbellariae** Etayo: on *Pseudocypbellaria*; **santessonii** Etayo: on *Sticta*; **punctum** (A.Massal.) Diederich & Pino-Bodas, comb. nov. [= *P. punctum* (A.Massal.) Rambold, Triebel & Coppins; = *B. uncialicola* (Zopf) D.Hawksw.]: on *Cladonia*; **varius** (Coppins, Rambold & Triebel) Diederich & Pino-Bodas, comb. nov. [= *P. varia* Coppins, Rambold & Triebel]: on *Trapeliopsis*.

Lit.: Alstrup & Hansen 2001; Etayo 2010b; Etayo & Sancho 2008; Hawksworth 1981; Pino-Bodas et al. 2017; Rambold & Triebel 1990; Suija et al. 2015b.

Class Lecanoromycetes familia incertae sedis

Family **Arthrorhaphidaceae** Poelt & Hafellner**Arthrorhaphis** Th.Fr.; type: *A. flavovirescens*, i.e. *A. citrinella*. Mol.: yes (T, L).

Species: 6-3-0 (13). **aeruginosa** R.Sant. & Tønsb.: on *Cladonia*; **alpina** (Schaer.) R.Sant.: juvenile parasite on *Baeomyces rufus*, later an independent lichen; **arctoparmeliae** Kocourk. & van den Boom: on *Arctoparmelia incurva*; **citrinella** (Ach.) Poelt [= *A. flavovirescens* (A.Massal.) Th.Fr.]: juvenile facultatively parasite on *Baeomyces rufus*, later or from the beginning an independent lichen; **grisea** Th.Fr.: on *Baeomyces*, later occasionally an independent lichen; **muddii** Obermayer: on *Dibaeis baeomyces*; **olivacea** R.Sant. & Tønsb.: on *Melanohalea olivacea*; **phyllobaeis** Etayo & Palice: on *Phyllobaeis*; **vaccillans** Th.Fr.: juvenile parasite on *Baeomyces*, later an independent lichen.
Lit.: Etayo 2017; Kocourková & van den Boom 2005; Obermayer 1994; Santesson & Tønsberg 1994.

Class Lecanoromycetes genus incertae sedis

Piccolia A.Massal.; type: *P. crocea* (Spreng.) A.Massal. (lichenized). Mol.: no.
Species: 0-1-0 (7). **nannaria** (Tuck.) Lendemer & Beeching: lichen, at least facultatively lichenicolous on *Pyrrhospora varians*.
Lit.: Lendemer & Harris 2014.

Class LEOTIOMYCETES O.E.Erikss. & Winka

Order Helotiales Korf & Lizon

Family Cordieritidaceae (Sacc.) Sacc.

Diplaeviopsis Giral & D.Hawksw.; type: *D. ranula*. Mol.: yes (T, L).
Species: 3-0-0. **japonica** Zhurb. & Diederich: on *Gyalolechia flavorubescens*; **ranula** Giral & D.Hawksw.: on *Lecanora strobilina* and *L. strobilinoïdes*; **symmictae** Diederich & Coppins: on *Lecanora symmicta*.
Lit.: Diederich & Coppins 2014; Etayo et al. 2015; Giral & Hawksworth 1991; Suija et al. 2015b; Zhurbenko et al. 2015a.

Llimoniella Hafellner & Nav.-Ros.; type: *L. scabridula*. Mol.: yes (L).
Species: 19-0-0. **acarosporicola** (Kocourk. & K.Knudsen) Diederich & Ertz: on *Acarospora socialis*; **adnata** Hafellner & Nav.-Ros.: on *Placidium*; **bergeriana** Etayo: on *Punctelia*; **catapyrenii** Zhurb., Kukwa & Flakus: on *Catapyrenium*; **cinnabarinae** Pérez-Ortega, Etayo & T.Sprib.: on *Ramboldia cinnabarina*; **fuscaetae** Hafellner & Obermayer: on *Acarospora fuscaeta*; **gregorellae** (Alstrup & D.Hawksw.) Triebel & Hafellner: on *Gregorella humida*; **groenlandiae** (Alstrup & D.Hawksw.) Triebel & Hafellner: on *Athalia* and *Flavoplaca*, possibly on *Gyalolechia* and *Xanthocarpia*; **heppiae** (Nav.-Ros., Hladun & Llimona) Diederich & Ertz: on *Heppia*; **parmotrematis** Etayo: on *Parmotrema*; **pertusariae** Diederich & Etayo: on *Lepra ophthalmiza* and *Pertusaria glaucomela*; **phaeophysciae** Diederich, Ertz & Etayo: on *Phaeophyscia*; **placomaroneae** Etayo & Diederich: on *Placomaronea candelerioides*; **placopsidis** Diederich & Fryday: on *Placopsis*; **pyrenulae** Diederich & Etayo: on *Pyrenula*; **ramalinae** (Müll.Arg.) Etayo & Diederich: on *Ramalina celsa* and *R. unilateralis*; **scabridula** (Müll.Arg.) Nav.-Ros. & Hafellner: on *Acarospora nodulosa* and *A. placodiiformis*; **terricola** (Arnold) M.Schultz, Diederich &

Ertz: on *Leptogium byssinum*; **vinosa** (Holien & Triebel) Diederich & Etayo: on *Ochrolechia* and *Lepra cf. borealis*.
Lit.: Alstrup & Hawksworth 1990; Diederich & Etayo 2000; Diederich et al. 2010b; Etayo 2010b, 2017; Pérez-Ortega et al. 2011b; Suija et al. 2015b; Zhurbenko 2013a.

Macroskyttea Etayo, Flakus, Suija & Kukwa; type: *M. parmotrematis*. Mol.: yes (T, L).
Species: 1-0-0. **parmotrematis** Etayo, Flakus & Kukwa: on *Parmotrema*.
Lit.: Etayo et al. 2015.

Rhymbocarpus Zopf; type: *R. punctiformis*, i.e. *R. geographici*. Mol.: yes (L).
Species: 12-0-0. **aggregatus** Etayo & Diederich: on *Buellia griseovirens*; **boomii** Etayo & Diederich: on *Dirina ceratoniae*; **cruciatus** (Sherwood, D.Hawksw. & Coppins) Etayo & Diederich: on *Diploicia canescens*; **ericetorum** (Körb.) Etayo, Diederich & Ertz: on *Dibaeis baeomyces*; **fuscoatrae** (Hafellner) Diederich & Etayo: on *Lecidea fuscoatra*; **geographici** (J.Steiner) Vouaux [= *R. punctiformis* Zopf]: on *Rhizocarpon*; **makarovae** Diederich & Etayo: on *Porpidia*; **neglectus** (Vain.) Diederich & Etayo: on the *Lepraria neglecta* group; **pertusariae** Diederich, Zhurb. & Etayo: on *Lepra panyrga*; **pubescens** (Etayo & Diederich) Diederich & Etayo: on *Lepraria*; **rocellae** (Etayo, Paz-Bermúdez & Diederich) Etayo, Diederich & Ertz: on *Rocella*; **stereocaulorum** (Alstrup & D.Hawksw.) Etayo & Diederich: on *Stereocaulon*.
Lit.: Diederich & Etayo 2000; Diederich et al. 2010b; Etayo & Diederich 2011; Suija et al. 2015b.

Skyttea Sherwood, D.Hawksw. & Coppins; type: *S. nitschkei*. Mol.: yes (T, L).
Species: 30-0-0. **anziaae** Etayo & Diederich: on *Anzia*; **buelliae** Sherwood, D.Hawksw. & Coppins: on *Amandinea punctata*; **bumyoungsungii** S.Y.Kondr. & J.-S.Hur: on unidentified epilithic thallus (*Gyalidea* or *Porpidia*?); **caesii** Diederich & Etayo: on *Mycoblastus* (incl. *M. caesius*); **carboneae** Diederich & Etayo: on *Carbonea montevidensis*; **cismonicae** Hafellner: on *Loxospora cismonica*; **dacampiae** Zhurb.: on *Dacampia hookeri*; **elachistophora** (Nyl.) Sherwood & D.Hawksw.: on cf. *Tylothallia biformigera*; **fusispora** Sherwood, D.Hawksw. & Coppins: on *Ochrolechia*; **gossypina** Etayo: on *Phlyctis argena*; **gregaria** Sherwood, D.Hawksw. & Coppins: on *Violella fucata*; **hawksworthii** Diederich: on *Verrucaria*; **heterochroae** Nav.-Ros. & Muñiz: on *Pertusaria heterochroa*; **insignis** Driscoll, S.R.Clayden & R.C.Harris: on *Lecanora insignis*; **lecanorae** Diederich & Etayo: on *Lecanora*; **mayrhoferi** Diederich & Etayo: on *Pertusaria melanospora*; **megalosporae** Etayo & Diederich: on *Megalospora tuberculosa*; **nitschkei** (Körb.) Sherwood, D.Hawksw. & Coppins: on *Thelotrema lepadinum*; **ochrolechia** Zhurb.: on *Ochrolechia trochophora*; **pertusariicola** Diederich & Etayo: on corticolous *Pertusaria*; **pyrenulae** Diederich, Etayo & Coppins: on *Pyrenula*; **radiatilis** (Tuck.) R.Sant., Etayo & Diederich: on cf. *Loxospora pustulata*; **recognita** Etayo & Diederich: on epiphytic crustose lichens; **richardsonii** Iturr. & D.Hawksw.: on an unidentified lichen; **spinosa** D.Hawksw. & Coppins: on *Verrucaria nigrescens*; **tavaresae** R.Sant., Etayo & Diederich: on *Pyrrhospora cf. querneae*; **tephromelarum** Kalb & Hafellner: on *Tephromela*; **thelotrematis** Diederich & Etayo: on *Thelotrema lepadinum*; **violacea** Etayo: on *Tephromela*; **viridis** D.Hawksw. & Coppins: on *Micarea cf. denigrata*.

Lit.: Diederich & Etayo 2000, 2004; Driscoll et al. 2016; Etayo 2002a, 2010c, 2017; Etayo & Sancho 2008; Hafellner 2000; Kondratyuk et al. 2018; Navarro-Rosinès & Muñiz 2009; Suija et al. 2015b; Zhurbenko et al. 2015a.

Thamnogalla D.Hawksw.; type: *T. crombiei*. Mol.: yes (T, L).
Species: 1-0-0. **crombiei** (Mudd) D.Hawksw. [≡ *Didymocyrtis thamnoliicola* Y.Joshi, R.Bajpai & Upreti]: on *Thamnomia*.
Lit.: Hoffmann & Hafellner 2000; Joshi et al. 2016c; Lord et al. 2013; Suija et al. 2015b.

Unguiculariopsis Rehm; type: *U. ilicincola* (Berk. & Broome) Rehm (saprotrophic). Mol.: yes (L).
Species: 15-0-0 (25). **acrocordiæ** (Diederich) Diederich & Etayo: on *Acrocordia gemmata*; **ahitii** D.Hawksw., D.J.Galloway & S.Y.Kondr.: on *Pseudocyphellaria*; **damingshanica** W.Y.Zhuang: on unidentified lichen on bamboo; **helmutii** S.Y.Kondr., L.Lökös & J.-S.Hur: on *Rinodina* aff. *sophorodes*; **lesdainii** (Vouaux) Etayo & Diederich: on *Lecanora saligna*; **lettau** (Grummann) Coppins: on *Evernia prunastri*; **lobariellum** S.Y.Kondr. & D.J.Galloway: on *Lobaria* and *Lobariella*; **lucaniae** Brackel: on *Lecidella elaeochroma*; **macrocarpa** Etayo: on *Pseudocyphellaria*; **manriquei** Etayo: on *Lobaria pulmonaria*; **Llimoniella muralicola** Halici: on *Protoparmeliopsis muralis* [belongs to *Unguiculariopsis* s.l.]; **peltigericola** Etayo: on *Peltigera*; **refractiva** (Coppins) Coppins: on *Bilimbia*; **thallophila** (P.Karst) W.Y.Zhuang: on *Lecanora*; **triregia** S.Y.Kondr. & D.J.Galloway: on *Sticta*.
Lit.: Brackel 2011a; Coppins 1988; Diederich & Etayo 2000; Etayo 2017; Etayo & Diederich 1996b; Etayo & Sancho 2008; Kondratyuk et al. 1994; Kondratyuk & Galloway 1995a; Kondratyuk & Galloway 1995b; Kondratyuk et al. 2016b; Suija et al. 2015b; Zhuang 2000.

Family Helicogoniaceae Baral

Geltingia Alstrup & D.Hawksw.; type: *G. associata*. Mol.: yes (T, L).
Species: 1-0-0. **associata** (Th.Fr.) Alstrup & D.Hawksw.: on *Ochrolechia*, more rarely on *Lepra dactylina* and *Thamnomia*.
Lit.: Alstrup & Hawksworth 1990; Diederich et al. 2010b; Suija et al. 2015b.

Family Helotiaceae Rehm

Bryoscyphus Spooner; type: *B. conocephali* (Boyd) Spooner. Mol.: yes.
Species: 1-0-0 (19). **lichenicola** Alstrup & M.S.Cole: on *Cladonia* cf. *pyxidata*.
Lit.: Alstrup & Cole 1998.

Family Hyaloscyphaceae Nannf.

Hyalopeziza Fuckel; type: *H. patula* (Pers.) Fuckel. Mol.: yes.
Species: 2-0-0 (15). **heterodermiae** Etayo: on *Heterodermia*; **rapax** Huhtinen: on *Pseudocyphellaria*.
Lit.: Etayo 2017; Huhtinen et al. 2008.

Hyphodiscus Kirschst.; type: *H. gregarius* Kirschst. Mol.: yes (T, L).

Species: 1-0-0 (16). **ucrainicus** (S.Y.Kondr.) Suija, Tsur'ykai & Diederich [≡ *Pezizella ucrainica* S.Y.Kondr.]: on *Cladonia*.

Lit.: Kondratyuk & Galloway 1995a; Oksner 2010; Suija et al. 2018; Zhurbenko & Pino-Bodas 2017.

Polydesmia Boud.; type: *P. pruinosa* (Berk. & Broome) Boud. Mol.: yes (T).
Species: 1-0-0 (7). **lichenis** Huhtinen & R.Sant.: on *Peltigera*.
Lit.: Huhtinen & Santesson 1997.

Protounguicularia Raitv. & R.Galán; type: *P. brevicapitata* Raitv. & R.Galán. Mol.: no.
Species: 4-0-0 (10). **fasciculata** (Etayo) Etayo: on *Ramalina stenospora*; **hispidula** (Etayo) Etayo: on *Psoroma hispidulum*; **nephromatis** (Zhurb. & Zavarzin) Huhtinen, D.Hawksw. & Ihlen: on *Nephroma*; **usneae** Etayo: on *Usnea*.
Lit.: Etayo 2010b, 2017; Etayo & Triebel 2010; Huhtinen et al. 2008; Zhurbenko 2007a.

Family Lachnaceae Raitv.

Solenopezia Sacc.; type: *S. solenia* Sacc. Mol.: no.
Species: 1-0-0 (7). **tetraspora** P.Henn.: on *Physcia integrata* [a poorly known species].
Lit.: Clauzade et al. 1989; Vouaux 1914.

Family Mollisiaceae Rehm

Mollisia (Fr.) P.Karst.; type: *M. cinerea* (Batsch) P.Karst. Mol.: yes (T).
Species: 1-0-0 (130). **collematis** Boud. [≡ *Pyrenopeziza collematis* (Boud.) Boud.]: on *Collema* [a poorly known species that does not belong to *Mollisia*].
Lit.: Clauzade et al. 1989; Vouaux 1914.

Niptera Fr.; type: *N. lacustris* (Fr.) Fr. Mol.: no. Both lichenicolous species are poorly known and possibly do not belong to *Niptera*.
Species: 2-0-0 (10). **lichenicola** (Speg.) Sacc.: on *Flavoparmelia caperata*; **microscopica** (P.Crouan & H. Crouan) Vouaux: on *Placynthiella uliginosa*.
Lit.: Clauzade et al. 1989; Vouaux 1914.

Trimmatostroma Corda s.l.; type: *T. salicis* Corda. Mol.: yes (T). Asexual, hyphomycetous. Probably polyphyletic, the lichenicolous taxa unlikely to be closely related to the type species.
Species: 8-0-1 (30). **arctoparmeliae** Brackel & Schiefelbein: on *Arctoparmelia incurva*; **cetrariae** Brackel: on *Cetraria islandica*; **dendrographae** Diederich, Ertz, U.Braun & Heuchert: on *Dendrographa*; **glebarum** Brackel: on *Flavoparmelia caperata*; **hierrense** Diederich & Ertz: on *Arthonia endlicheri*; **lecanoricola** Diederich, Etayo, U.Braun & Heuchert: on *Lecanora*; **quercicola** Diederich, U.Braun & Heuchert: facultatively lichenicolous on sterile, corticolous, crustose lichens; **umbilicariicola** Heuchert & U.Braun: on *Umbilicaria*; **varicellariae** Heuchert & U.Braun: on *Varicellaria rhodocarpa*.
Lit.: Brackel 2015; Diederich et al. 2010a; Heuchert & Braun 2014; Schiefelbein et al. 2017; Zhurbenko & Brackel 2013.

Family **Pezizellaceae** Velen.

Calycina Gray [a hemihomonym of *Calycina* Gregory, Echinozoa]; type: *C. herbarum* (Pers.) Gray [= *Pezizella* Fuckel]; type: *P. pulchella* Fuckel]. Mol.: yes (T, L). Two species are provisionally placed here pending a phylogenetic reassessment of the lichenicolous taxa.

Species: 3-0-0 (30). **alstrupii** Suija & Motiejūnaitė: on *Lobaria pulmonaria*; **Pezizella epithallina** (W. Phillips & Plowr.) Sacc.: on *Peltigera*; **Pezizella stictae** Etayo: on *Sticta*.

Lit.: Etayo 2002a; Hawksworth 1980b; Suija & Motiejūnaitė 2017; Suija et al. 2015b.

Chalara (Corda) Rabenh.; type: *C. fusidioides* (Corda) Rabenh. Mol.: yes (T).

Species: 3-0-1 (100). **lichenicola** M.S.Christ.: on *Cladonia*; **lobariae** Etayo: on *Lobaria pulmonaria*; aff. **microspora** (Cordes) Hughes: facultatively lichenicolous on *Cladonia coniocraea*; **pseudocypbellariae** Etayo: on *Pseudocypbellaria faveolata*.

Lit.: Brackel 2015; Christiansen 1993; Etayo & Diederich 1996b; Etayo & Sancho 2008.

Family **Sclerotiniaceae** Whetzel

Pycnopeziza W.L.White & Whetzel; type: *P. sympodialis* W.L.White & Whetzel [≡ *Acarosporium* Bubák & Vleugel]; type: *A. sympodiale* Bubák & Vleugel]. Mol.: yes (T).

Species: 1-0-0 (5). **Acarosporium lichenicola** Ihlen & Tønberg: on *Icmadophila* [provisionally placed here, possibly not belong to *Pycnopeziza*].

Lit.: Ihlen 1998.

Order Helotiales genera incertae sedis

Brackelia Zhurb.; type: *B. lunkei*. Mol.: no.

Species: 1-0-0. **lunkei** Zhurb.: on *Cladonia*.

Lit.: Zhurbenko & Pino-Bodas 2017.

Cecidioskyttea Etayo; type: *C. osorioi*. Mol.: no.

Species: 1-0-0. **osorioi** Etayo: on *Parmotrema fistulatum*.

Lit.: Etayo & Osorio 2004.

Chloroepilichen Etayo; type: *C. rolffii*. Mol.: no.

Species: 1-0-0. **rolffii** Etayo: on *Yoshimuriella* cf. *peltigera*.

Lit.: Etayo 2010b.

Echinodiscus Etayo & Diederich [a younger synonym of *Echinodiscus* Mann, diatoms, and of *Echinodiscus* Bentham, Fabaceae; a hemihomonym of *Echinodiscus* Leske, Echinozoa]; type: *E. lesdainii*. Mol.: no.

Species: 2-0-0. **kozhevnikovii** Zhurb.: on *Cetraria*; **lesdainii** (Vouaux) Etayo & Diederich: on *Lecania*.

Lit.: Etayo & Diederich 2000; Zhurbenko 2009a.

Pleoscutula Vouaux; type: *P. arsenii*. Mol.: no.

Species: 2-0-0. **arsenii** Vouaux: on *Heterodermia*; **hypotrachynae** Etayo & Diederich: on *Hypotrachyna*.

Lit.: Etayo 2002a; Hafellner 1982b.

Skyttella D.Hawksw. & R.Sant.; type: *S. mulleri*. Mol.: no.

Species: 2-0-0. **mulleri** (Willey) D.Hawksw. & R.Sant.: on *Peltigera*; **stictae** Etayo: on *Sticta*.

Lit.: Etayo 2017; Hawksworth & Santesson 1988.

Strossmayeria Schulzer; type: *S. rackii* Schulzer [= *Pseudospiropes* M.B.Ellis]; type: *P. nodosus* (Sacc.) M.B.Ellis]. Mol.: yes. Molecular data of both facultatively lichenicolous species are needed to determine if they belong to *Strossmayeria*.

Species: 0-0-2 (16). **Pseudospiropes costaricensis** (E.F.Morris) de Hoog & Arx: facultatively lichenicolous on *Crocodia aurata*; **P. longipilus** (Corda) Hol.-Jech.: facultatively lichenicolous on *Lepraria*.

Lit.: Braun et al. 2008; Johnston et al. 2014.

Order **Phacidiales** Höhn.

Order Phacidiales genus incertae sedis

Epithamnolia Zhurb.; type: *E. karatyginii*. Mol.: yes (L). Asexual.

Species: 7-0-0. **atrolazulina** (Etayo) Diederich, comb. nov. [≡ *Hainesia atrolazulina* Etayo]: on *Hypotrachyna*; **brevicladoniae** (Diederich & van den Boom) Diederich & Suija [≡ *H. brevicladoniae* Diederich & van den Boom]; on *Cladonia*; **karatyginii** Zhurb.: on *Thamnolia*; **longicladoniae** (Diederich & van den Boom) Diederich & Suija [≡ *H. longicladoniae* Diederich & van den Boom]; on *Cladonia*; **pertusariae** (Etayo & Diederich) Diederich & Suija [≡ *H. pertusariae* Etayo & Diederich; = *H. bryonora* Zhurb.; = *H. peltigerae* Zhurb. & Davydov]; on *Bryonora*, *Cladonia*, *Peltigera* and *Pertusaria*; **rangiferinae** E.Zimm., Diederich & Suija: on *Cladonia rangiferina*; **xanthoriae** (Brackel) Diederich & Suija [≡ *H. xanthoriae* Brackel; = *H. aeruginascens* Brackel; = *H. lecanorae* Brackel]; on *Candelaria*, *Hypogymnia*, *Lecanora*, *Melanohalea*, *Parmelia*, *Phaeophyscia*, *Physcia*, *Platismatia*, *Polycauliona*, *Protoparmeliopsis*, *Pseudevernia*, *Punctelia*, *Rusavskia* and *Xanthoria*.

Lit.: Brackel 2009, 2014; Diederich & van den Boom 2013; Etayo 2017; Etayo & Diederich 1996a; Suija et al. 2018b; Zhurbenko 2012, 2013b; Zhurbenko & Brackel 2013.

Class Leotiomycetes genus incertae sedis

Epicladonia D.Hawksw. s.str.; type: *E. sandstedei*. Mol.: yes (T, L). Asexual, pycnidial. Two further species, *E. simplex* and *E. stenospora*, are treated within *Epicladonia* s.l. under Pilocarpaceae, based on phylogenetic results.

Species: 3-0-0. **heterodermiae** Y.Joshi, Falswal & R.Joshi: on *Heterodermia*; **lapponica** Ihlen: on *Pleopsidium chlorophanum*; **sandstedei** (Zopf) D.Hawksw.: on *Cladonia*.

Lit.: Hawksworth 1981; Ihlen & Wedin 2005; Joshi et al. 2017b; Pino-Bodas et al. 2017.

Class LABOULBENIOMYCETES Engl.

Order **Laboulbeniales** Lindau s.l.

Order Laboulbeniales genus incertae sedis

Gliocephalis Matr.; type: *G. hyalina* Matr. Mol.: yes (T).

Species: 1-0-0 (2). **pulchella** (Penz. & Sacc.) D.Hawksw.: on *Sticta*.

Lit.: Hawksworth 1979a.

Class LICHINOMYCETES Reeb, Lutzoni & Cl.Roux

Order Lichinales Henssen & Büdel

Family Lichinaceae Nyl.

Lichinodium Nyl.; type: *L. sirosiphoideum*. Mol.: no.
Species: 0-1-0 (4). **sirosiphoideum** Nyl.: lichen, juvenile parasite of *Parmelia* s.l.
Lit.: Rambold & Triebel 1992.

Phylliscum Nyl.; type: *P. demangeonii*. Mol.: yes (T, L).
Species: 0-1-0 (8). **demangeonii** (Moug. & Mont.) Nyl.: lichen, juvenile parasite on *Ochrolechia frigida*.
Lit.: Rambold & Triebel 1992.

Class SORDARIOMYCETES O.E.Erikss. & Winka

Subclass DIAPORTHOMYCETIDAE Senan., Maharachch. & K.D.Hyde

Subclass Diaporthomycetidae familiae incertae sedis

Family Sporidesmiaceae Fr.

Sporidesmium Link; type: *S. atrum* Link. Mol.: yes.
Species: 3-0-0 (330). **bacidiicola** Alstrup: on *Bacidia rubella*; **lichenicola** Iturr., D.Hawksw. & J.L.Crane: on *Leptogium*; **usneae** Etayo: on *Usnea*.
Lit.: Alstrup (1991); Etayo 2017; Iturriaga et al. (2008).

Family Trichosphaeriaceae G.Winter

Trichosphaeria Fuckel; type: *T. pilosa* (Pers.) Fuckel. Mol.: yes (T).
Species: 1-0-0 (20). **lichenum** P.Karst. & Har.: on *Peltigera* [a poorly known species].
Lit.: Clauzade et al. 1989; Hawksworth 1980b.

Subclass HYPOCREOMYCETIDAE O.E.Erikss. & Winka

Order Coronophorales Nannf.

Family Nitschkiaceae (Fitzp.) Nannf.

Acanthonitschkea Speg.; type: *A. argentinensis* Speg. Mol.: yes (T).
Species: 1-0-0 (10). **peltigericola** (Alstrup & Olech) O.E.Erikss. & R.Sant. [= *Hystrix peltigericola* Alstrup & Olech]: on *Peltigera*.
Lit.: Alstrup & Olech 1993.

Lasiosphaeriopsis D.Hawksw. & Sivan.; type: *L. salisburyi*. Mol.: no.
Species: 7-0-0. **cephalodiorum** (Rostr.) Alstrup: on *Platycopsis*; **christiansenii** Alstrup & D.Hawksw. [=? *L. super-*

sparsa]: on *Porpidia tuberculosa*; **lecanorae** Pérez-Ortega & Halcı: on *Lecanora polytropia*; **pilophori** Zhurb. & Triebel: on *Pilophorus*; **salisburyi** D.Hawksw. & Sivan.: on *Peltigera*; **stereocaulicola** (Linds.) O.E.Erikss. & R.Sant.: on *Stereocaulon*; **supersparsa** (Zopf) Triebel: on *Porpidia*.
Lit.: Alstrup et al. 1994; Alstrup & Hawksworth 1990; Eriksson & Santesson 1986; Hawksworth 1980b; Pérez-Ortega & Halcı 2008; Triebel 1989; Zhurbenko & Triebel 2005.

Rhagadostoma Körb.; type: *R. corrugatum*, i.e. *R. lichenicola*. Mol.: no.
Species: 7-0-0. **boleae** Nav.-Ros. & Hladun: on *Lecania*; **brevisporum** (Nav.-Ros. & Hladun) Nav.-Ros.: on *Nephroma*, *Peltigera* and *Solorina*; **collematum** Etayo & Nav.-Ros.: on *Lathagrimum auriforme*; **lichenicola** (De Not.) Keissl. [= *R. corrugatum* Körb.]: on *Solorina*; **pannariae** Etayo: on *Pannaria*; **rugosum** Nav.-Ros. & Hladun: on *Verrucaria nigrescens*; **verrucarium** Nav.-Ros. & Hladun: on *Verrucaria*.
Lit.: Etayo & Sancho 2008; Navarro-Rosinés & Hladun 1994; Navarro-Rosinés et al. 1999.

Rhagadostomella Etayo; type: *R. gregaria*. Mol.: no.
Species: 1-0-0. **gregaria** Etayo: on *Sticta*.
Lit.: Etayo 2002a.

Order Hypocreales Lindau

Family Bionectriaceae Samuels & Rossman

Acremonium Link; type: *A. alternatum* Link. Mol.: yes (T, L).
Asexual, hyphomycetous.
Species: 4-0-6 (150). **antarcticum** (Speg.) D.Hawksw.: on various lichens, facultatively lichenicolous; **bavaricum** Brackel: on *Melanelixia glabratula*; **hypholomatis** (Boedijn) D.Hawksw.: on *Physcia stellaris*, facultatively lichenicolous [the lichenicolous populations are possible the asexual stage of *Pronectria echinulata* Lowen]; **lichenicola** W.Gams: on lichens and other substrata; **persicinum** (Nicot) W.Gams: isolated from lichens, facultatively lichenicolous; **pertusariae** Brackel & Etayo: on *Lepra* and *Pertusaria*; **psychrophilum** Möller & Gams: isolated from lichens, probably lichenicolous; **spagazzinii** D.Hawksw.: on *Leptogium*; **strictum** W.Gams: facultatively lichenicolous; **subeffusum** (Ellis & Galw.) Etayo & Brackel: on *Physcia millegrana* and possibly other lichens.
Lit.: Brackel et al. 2012; Diederich 1989; Diederich & Braun 2009; Hawksworth 1979a; Lowen 1995.

Globonectria Etayo; type: *G. cochensis*. Mol.: no.
Species: 1-0-0. **cochensis** Etayo: on *Lobaria pallida*.
Lit.: Etayo 2002a.

Nectriopsis Maire; type: *N. violacea* (Fr.) Maire. Mol.: yes (T, L).
Species: 24-0-1 (70). **albida** Etayo: on *Sticta*; **cariosae** Brackel & D.G.Zimmermann: on *Cladonia*; **cladoniicola** M.S.Cole & D.Hawksw.: on *Cladonia*; **collematis** Diederich: on *Collema*; **curtiseta** Etayo: on *Sticta*; **frangospora** Brackel: on *Lepra albescens* and *Pertusaria rubefacta*; **gangwondoensis** S.Y.Kondr., L.Lókös & J.-S.Hur: on *Phaeophyscia adiastrata*; **guamuesii** Etayo: on *Sticta*; **heterodermiae** Etayo: on *Heterodermia*; **hirta** Etayo: on various lichens; **indigens** (Arnold) Diederich & Schroers: on perithecioid lichens, often near water; **lecanodes** (Ces.) Diederich & Schroers: on cyanobacterial macrolichens,

mainly *Lobaria*, *Peltigera* and *Pseudocyphellaria*, also on *Collema* and *Leptogium*; **leptogii** Diederich: on *Leptogium*; **lichenophila** (Speg.) Etayo: on *Heterodermia*; **melongenoides** Etayo: on *Gomphillus*; **micareae** Diederich, van den Boom & Ernst: on *Micarea viridileprosa*; **mindoenis** (Petrak) (Petr.) Samuels: facultatively lichenicolous on *Coenogonium*; **peruviana** Etayo & R.Sant.: on *Cora* and *Coccocarpia*; **physciicola** D.Hawksw. & Earl.-Benn.: on *Physcia stellaris*; **porinicola** Samuels: on foliicolous *Porina*; **silvaustralis** Etayo: on *Pseudocyphellaria*; **tatrensis** (Alstrup) Lisická & Alstrup: on *Thelidium*; **verseghyklarae** S.Y.Kondr., L.Lökös & J.-S.Hur: on *Verseghya klarae*; **vinosa** Etayo: on *Usnea*; **vidida** Etayo & Sipman: on unidentified crustose lichen.

Lit.: Alstrup 1996; Aptroot et al. 1997; Brackel 2010a; Brackel & Zimmermann 2012; Cole & Hawksworth 2001; Earland-Bennett et al. 2006; Etayo 2002a, 2010a, 2017; Etayo & Sancho 2008; Kondratyuk et al. 2016a, 2018; Matzer 1996; Samuels 1988; Sérusiaux et al. 1999.

Oviculispora Etayo; type: *O. parmeliae*. Mol.: yes (T, L).

Species: 2-0-0. **macrospora** Etayo: on sterile saxicolous crust (Gomphillaceae?); **parmeliae** (Berk. & Curt.) Etayo: on various lichens.

Lit.: Etayo 2010b.

Paranectria Sacc.; type: *P. affinis*. Mol.: no.

Species: 4-0-0. **affinis** (Grev.) Sacc.: on *Ephebe pubescens*; **alstrupii** Zhurb.: on various lichens; **oropensis** (Rabenh.) D.Hawksw. & Piroz.: on various lichens; **superba** D.Hawksw.: on *Peltigera*.

Lit.: Clauzade et al. 1989; Hawksworth 1982a; Rossman et al. 1999; Zhurbenko 2009d.

Pronectria Clem.; type: *P. lichenicola*, i.e. *P. robergei*. Mol.: yes (T, L).

Species: 43-0-1. **algicola** Vondrák, Naumovich & Khodos.: on terricolous microbial crusts possibly associated with *Sarcosagium* or *Steinia*; **angulospora** Etayo: on *Heterodermia*; **biglobosa** Etayo: on *Hypotrachyna*; **caloplacae** Khodos., Vondrák & Naumovich: on *Flavoplaca austro-citrina*; **casaresii** Etayo: on *Evernia prunastri*; **collematis** Etayo & Brackel: on *Lathagrium*; **dealbans** (Müll.Arg.) Etayo & Breuss: on *Endocarpon*; **dillmaniae** Zhurb.: on *Catapyrenium cinereum*; **diplococca** Kocourk., Khodos., Naumovich, Vondrák & Motiej.: on *Collema*; **echinulata** Lowen: on *Phaeophyscia*, *Physcia* and *Physconia*; **erythrinella** (Nyl.) Lowen: on *Peltigera*; **fragmospora** Etayo: on *Usnea*; **hymeniicola** Etayo: on *Collema*; **invisibilis** Etayo: on *Nephroma antarcticum*; **japonica** Zhurb., Tadome & Y. Ohmura: on *Ochrolechia*; **lecideicola** Zhurb.: on *Lecidea ramulosa*; **leptogii** Etayo: on *Leptogium*; **microspora** Etayo: on *Lobaria pallida*; **minuta** Motiej. & Kukwa: on *Cladonia* subg. *Cladina*; **neofissuripodiens** F.Berger & E.Zimm.: on *Lobaria*; **occulta** Etayo: on *Usnea*; **oligospora** Lowen & Rogersen var. **oligospora**: on *Punctelia*; **oligospora** var. **octospora** Etayo: on *Punctelia*; **parmotrematis** Etayo: on *Parmotrema*; **pedemontana** Brackel: on *Lathagrium auriforme*; **pertusariicola** Lowen: on *Lepra* and *Pertusaria*; **pilosa** Etayo & López Silanes: on *Collema*; **pyncnidioidea** Etayo: on *Heterodermia*; **rhizocarpicola** Brackel: on *Rhizocarpon geographicum*; **robergei** (Mont. & Desm.) Lowen [= *P. lichenicola* (Ces.) Clem.; = *Illosporium carneum* Fr.]: on *Peltigera* and *Solorina*; **rolfiana** Etayo: on *Solorina*; **rose-opunctata** Etayo: on *Hypotrachyna*; **santessonii** (Lowen & D.Hawksw.) Lowen: on *Anaptychia runcinata*; **sticticola**

Etayo: on *Stictia*; **tenacis** (Vouaux) Lowen: on *Collema*; **tenispora** (D.Hawksw.) Lowen: on *Peltigera*; **terrestris** Lowen & Diederich: on *Thrombium epigaeum*; **tibellii** Zhurb.: on *Cladonia*; **tincta** (Fuckel) Lowen: on *Anaptychia ciliaris*; **toninia** Etayo: on *Toninia sedifolia*; **verrucariae** (Vouaux) Lowen: on *Verrucaria*; **walkerorum** Zhurb.: on *Ochrolechia*; **xanthoriae** Lowen & Diederich: on *Xanthoria*; **zhurbenkoi** Brackel: on *Peltigera praetextata*.

Lit.: Berger & Zimmermann 2016; Brackel 2013a, 2013b, 2015; Brackel & Etayo 2010; Etayo 1998, 2001, 2002a, 2010b, 2010c, 2017; Etayo & Breuss 1996; Etayo & Diederich 1996b; Etayo & Sancho 2008; Etayo & Triebel 2010; Hawksworth 1979a; Khodosovtsev 2012; López de Silanes et al. 2009; Lowen 1995; Lowen & Diederich 1990; Lowen & Hawksworth 1986; Motiejūnaitė & Kukwa 2008; Rossman et al. 1999; Sikaroodi et al. 2001; Zhurbenko 2007b, 2009d; Zhurbenko & Alstrup 2004; Zhurbenko et al. 2005, 2018.

Trichonectria Kirschst.; type: *T. aculeata* Kirschst. Mol.: yes.

Species: 15-0-0 (19). **anisospora** (Lowen) van den Boom & Diederich [= *Acremonium pedatum* Lowen]: on *Hypogymnia*; **apiculata** Etayo: on *Usnea*; **australis** Etayo: on *Usnea*; **calopadiicola** Farkas & Flakus: on foliicolous *Calopadia* cf. *puiggari*; **cladoniicola** (Alstrup & Svane) Alstrup: on *Cladonia*; **furcatosetosa** Brackel: on necrosed *Melanelixia*, *Parmelia*, *Physcia* and *Candelariella*; **hirta** (A.Bolxam) Petch: on corticolous lichens; **hypotrachynae** Etayo: on *Hypotrachyna*; **intermedia** Etayo: on *Parmotrema*; **leptogiicola** Etayo: on *Leptogium*; **pertusariae** Etayo & van den Boom: on *Pertusaria*; **pyrenaica** Gardiennet & Lechat: on *Usnea*; **rubefaciens** (Ellis & Everh.) Diederich & Schroers [= *Nectriopsis rubefaciens* (Ellis & Everh.) M.S.Cole & D.Hawksw.; = *Acremonium rhabdosporum* W.Gams]: on Parmeliaceae; **setadpressa** Etayo: on *Lobaria*; **usnicola** Etayo: on *Usnea*.

Lit.: Alstrup & Svane 1998; Brackel 2014; Etayo 2001, 2002a, 2017; Etayo & Sancho 2008; Etayo & van den Boom 2005; Farkas & Flakus 2016; Gardiennet & Lechat 2012; Hawksworth 1978b; Rossman et al. 1999; Sérusiaux et al. 1999.

Family **Clavicipitaceae** (Lindau) O.E.Erikss.

Neobarya Lowen; type: *N. parasitica* (fungicolous). Mol.: yes (T).

Species: 4-0-0 (10). **ciliaris** Etayo: on *Heterodermia*; **darwiniana** Etayo: on *Nephroma antarcticum*; **lichenophila** (Ferd. & Winge) Lowen & Samuels: on *Cladonia*; **peltigerae** Lowen, Boqueras & Gómez-Bolea: on *Peltigera*.

Lit.: Candoussau et al. 2007; Etayo 2002a; Etayo & Sancho 2008.

Family **Cordycipitaceae** G.H.Sung, J.M.Sung, Hywel-Jones & Spatafora

Sypastospora P.F.Cannon & D.Hawksw.; type: *S. parasitica* (Tul.) P.F.Cannon & D.Hawksw. Mol.: yes (T).

Species: 1-0-0 (4). **cladoniae** Etayo: on *Cladonia foliacea*.
Lit.: Etayo 2008.

Family **Hypocreaceae** De Not.

Hypomyces (Fr.) Tul. & C.Tul.; type: *H. lactifluorum* (Schwein.) Tul. & C.Tul. Mol.: yes (T, L).

Species: 1-0-0 (150). **peltigericola** Lechat & Gardiennet: on *Peltigera canina*.

Lit.: Lechat et al. 2017.

Lichenobarya Etayo, Diederich & Lawrey; type: *L. usneae*. Mol.: yes (T, L).
Species: 1-0-0. **usneae** (Etayo) Etayo, Diederich & Lawrey: on *Usnea*.
Lit.: Etayo 2000a; Lawrey et al. 2015.

Family Nectriaceae Tul. & C.Tul.

Fusarium Link; type: *F. roseum* Link. Mol.: yes. Asexual, hyphomycetous.
Species: 2-0-0 (120). **pallens** Link: on *Myriolecis hagenii*; **peltigerae** Westend.: on *Peltigera*.
Lit.: Hawksworth 1979a.

Nectria (Fr.) Fr. s.l. [a hemihomonym of *Nectria* Gray, Asterozoa]; type: *N. cinnabarina* (Tode) Fr. Mol.: yes (T).
Species: 2-0-1 (29). **brutia** Diederich & Puntillo: on *Collema* [does not belong to *Nectria* s.str.]; **byssophila** Rossman [possibly related to *Lichenobarya* or *Neobarya*]; on macrolichens; **paraguayensis** Speg.: facultatively lichenicolous on lichens.
Lit.: Diederich & Puntillo 1995; Etayo & Sancho 2008; Hirooka et al. 2012.

Xenonectriella Weese; type: *X. lutescens*. Mol.: no.
Species: 18-0-0. **aurantiaca** Etayo: on *Pseudocyphellaria*; **calabrica** Brackel & Puntillo: on *Pertusaria pertusa*; **coppinsiana** Etayo: on *Yoshimuriella subdissecta*; **dirinariae** Etayo & van den Boom: on *Dirinaria*; **fissuriprodiens** (Etayo) Etayo: on *Lobaria*; **humilis** Etayo: on *Pseudocyphellaria*; **leptaleae** (J.Steiner) Rossman & Lowen: on *Phaeophyscia*, *Physcia* and *Physconia*; **leptaleoides** (Etayo) Etayo: on *Leptogium*; **lutescens** (Rehm) Weese: on *Peltigera* and *Solorina*; **ornamentata** (D.Hawksw.) Rossman: on *Peltigera*; **protopannariae** (Zhub.) Brackel: on *Protopannaria pezizoides*; **rosea** Etayo: on *Pannaria*; **rugulatispora** Etayo: on *Lobariella*; **septemseptata** (Etayo) Etayo & van den Boom: on *Melanelixia* and *Melanohalea*; **streimannii** (S.Y.Kondr., Coppins & D.J.Galloway) Rossman: on *Lobaria* and *Sticta*; **subimperspicua** (Speg.) Etayo var. **subimperspicua**: on *Parmelia* and *Punctelia*, also reported from *Physcia*; **subimperspicua** var. **degenerans** Etayo: on *Parmotrema*; **vertebrata** Etayo: on *Heterodermia*.
Lit.: Brackel 2014; Brackel & Puntillo 2016; Etayo 2002a, 2017; Etayo & Sancho 2008; Etayo & Triebel 2010; Etayo & van den Boom 2013; Rossman et al. 1999; van den Boom & Etayo 2014.

Family Niessliaceae Kirschst.

Atronectria Etayo; type: *A. magellanica*. Mol.: no.
Species: 1-0-0. **magellanica** Etayo: on *Pseudocyphellaria* and *Nephroma*.
Lit.: Etayo & Sancho 2008.

Melanopsamma Niessl.; type: *M. pomiformis* (Pers.) Sacc. Mol.: yes (T).
Species: 1-0-0 (40). **lettauiana** (Keissl.) Vouaux: on saxicolous, crustose lichens [a poorly known species].
Lit.: Clauzade et al. 1989.

Niesslia Auersw.; type: *N. chaetomium* (Corda) Auersw. [= *Nitschkiopsis* Nannf. & R.Sant.; type: *N. stictarum*]. Mol.: yes (L).
Species: 17-0-0 (43). **cladoniicola** D.Hawksw. & W.Gams: on *Cladia* and *Cladonia* [anamorph: *Monocillium* sp.]; **coenogonii** van den Boom: on *Coenogonium*; **echinoides** Etayo, Flakus & Kukwa: on *Erioderma*; **evae** Etayo: on *Erioderma*; **globospora** Etayo: on *Cora*; **keissleri** Zhub. [= *Echinothecium cladoniae* Keissl., nom. nud.]; on *Cladia* and *Cladonia*; **kununguakii** Alstrup & E.S.Hansen: on *Arthro-rhaphis alpina*; **lobariae** Etayo & Diederich: on *Lobaria*; **peltigericola** (D.Hawksw.) Etayo [= *Wentomyces peltigericola* D.Hawksw.; = *Raciborskiomyces peltigericola* (D.Hawksw.) M.E.Barr]; on *Peltigera*; **pseudocyphellariae** Etayo & Diederich: on *Pseudocyphellaria*; **robusta** Tretiach: on *Tephromela grumosa*; **schizospora** Etayo: on *Hypotrachyna*; **stictarum** (Nannf. & R.Sant.) R.Sant. & Tretiach subsp. **stictarum** [= *Nitschkiopsis stictarum* Nannf. & R.Sant.]; on *Sticta*; **stictarum** subsp. **nuda** Etayo: on *Lobariella*; **tatjanae** (S.Y.Kondr.) Etayo: on *Pseudocyphellaria*; **tetrahedrospora** Etayo: on *Dichosporidium* [possibly belongs to *Trichosphaerella*, fide Lendemer et al. 2016]; **yaganae** Etayo: on *Nephroma antarcticum*.
Lit.: Alstrup & Hansen 2001; Etayo 2000, 2002a, 2017; Etayo & Diederich 1996b; Etayo & Sancho 2008; Etayo et al. 2013a; Hawksworth 1975, 1979a; Tretiach 2002; van den Boom et al. 2017; Zhurbenko & Pino-Bodas 2017.

Trichosphaerella E.Bommer, M.Rousseau & Sacc.; type: *T. decipiens* E.Bommer, M.Rousseau & Sacc. Mol.: yes.
Species: 1-0-0 (4). **buckii** R.C.Harris & Lendemer: on *Punctelia rudecta*.
Lit.: Lendemer et al. 2016.

Order Hypocreales genera incertae sedis

Cephalosporiopsis Peyronel; type: none. Mol.: no. Asexual, hyphomycetous. A genus of uncertain application.
Species: 0-0-1 (10). **epiparasitaster** Alstrup: on the lichenicolous fungus *Chaenothecopsis parasitaster*.
Lit.: Alstrup 1997.

Chondronectria Etayo, Flakus & Kukwa; type: *C. eriodermatica*. Mol.: no.
Species: 1-0-0. **eriodermatica** Etayo, Flakus & Kukwa: on *Erioderma*.
Lit.: Etayo 2017.

Cylindronectria Etayo; type: *C. cyanobactericola*. Mol.: no.
Species: 0-0-1. **cyanobactericola** Etayo: on epilichenic cyanobacteria, doubtfully lichenicolous.
Lit.: Etayo 2017.

Illosporiopsis D.Hawksw.; type: *I. christiansenii*. Mol.: yes (T, L). Asexual, sporodochial.
Species: 1-0-0. **christiansenii** (B.L.Brady & D.Hawksw.) D.Hawksw.: on various corticolous lichens.
Lit.: Lowen et al. 1986; Sikaroodi et al. 2001.

Leptobarya Etayo; type: *L. nigra*. Mol.: no.
Species: 2-0-0. **auranticarpa** Etayo: on *Leptogium*; **nigra** Etayo: on *Leptogium*.
Lit.: Etayo 2017.

Roselliniella Vain.; type: *R. nephromatis*. Mol.: yes (L).

Species: 19-0-0. **africana** Diederich: on *Usnea*; **atlantica** Matzer & Hafellner: on *Xanthoparmelia*, *Hypotrachyna* and *Platismatia*; **cladoniae** (Anzi) Matzer & Hafellner: on *Cladonia*; **coccocarpiæ** (Pat.) Matzer & R.Sant.: on *Degelia*; **epiphylla** Matzer & Hafellner: on foliicolous *Sporopodium*; **eriodermicola** Matzer & R.Sant.: on *Erioderma tomentosum*; **euparmeliicola** Millanes & D.Hawksw.: on *Parmelia* s.str.; **heterodeae** Matzer & Hafellner: on *Cladia muelleri*; **lecideae** Darmostuk, Khodos. & Naumovich: on *Lecidea fuscoatra*; **microthelia** (Wallr.) Nik.Hoffm. & Hafellner: on *Trapelia*; **muralis** van den Boom: on *Protoparmeliopsis muralis*; **nephromatis** (Crouan) Matzer & Hafellner: on *Nephroma*; **oxyspora** Matzer & R.Sant.: on *Coccocarpia*; **pannariae** Matzer & Hafellner: on *Protopannaria pezizoides*; **papuana** Diederich: on *Usnea*; **peltigericola** D.Hawksw. & Miądl.: on *Peltigera*; **ramirezii** Etayo: on *Lobaria*; **stereocaulorum** Zhurb., Kukwa & Oset: on *Stereocaulon*; **stictae** Etayo: on *Sticta*.

Lit.: Aptroot et al. 1997; Darmostuk et al. 2018; Etayo 2002a; Hawksworth & Miądlkowska 1997a; Hawksworth et al. 2010b; Hoffmann & Hafellner 2000; Matzer & Hafellner 1990; van den Boom 2015; Zhurbenko et al. 2009.

Trichothecium Link; type: *T. roseum* (Pers.) Link. Mol.: yes (T, L). Asexual, hyphomycetous.

Species: 0-0-1 (9). **roseum** (Pers.) Link: facultatively lichenicolous.

Lit.: Hawksworth 1979a.

Order Microscales Benny & Kimbr.

Family Graphiaceae De Beer

Graphium Corda [a hemihomonym of *Graphium* Scopoli, Lepidoptera]; type: *G. penicillioides* Corda. Mol.: yes (T). Asexual, synnematous.

Species: 2-0-0 (20). **aphthosae** Alstrup & D.Hawksw.: on *Peltigera* and other terricolous lichens, possibly algal; **samogiticum** Motiej. & Alstrup: over *Sarcosagium* and *Verrucaria*, possibly algal.

Lit.: Alstrup & Hawksworth 1990; Motiejūnaitė & Alstrup 2006.

Subclass SORDARIOMYCETIDAE O.E.Erikss. & Winka

Order Chaetosphaeriales Huhndorf, A.N.Mill. & F.A.Fernández

Family Chaetosphaeriaceae Réblová, M.E.Barr & Samuels

Dinemasporium Lév.; type: *D. graminum*, i.e. *D. strigosum*. Mol.: yes (T, L). Asexual, pycnidial.

Species: 0-0-1 (35). **strigosum** (Fr.) Sacc. [= *D. gramineum* (Lib.) Lév.]: facultatively lichenicolous on *Peltigera*, more rarely other lichens.

Lit.: Etayo 2017; Miądlkowska & Alstrup 1995.

Order Phyllachorales M.E.Barr.

Family Phyllachoraceae Theiss. & P.Syd.

Lichenochora Hafellner; type: *L. thallina*, i.e. *L. obscuroides*. Mol.: no.

Species: 44-0-0. **acutispora** Etayo: on *Fuscopannaria magellanica*; **aipoliae** Etayo, Nav.-Ros. & Coppins: on *Physcia aipolia*; **aprica** Hafellner & Nik.Hoffm.: on *Aspicilia*; **arctica** Zhurb.: on *Candelariella canadensis* and neighbouring *Rinodina terrestris*; **atrans** Halıcı, K.Knudsen & Candan: on *Psora decipiens*; **bacidiispora** Etayo: on *Parmotrema*; **bellemerei** Nav.-Ros., Cl.Roux & Diederich: on *Menegazzia*; **caloplacae** Zhurb.: on *Athalia*, *Blastenia*, *Bryoplaca* and *Caloplaca* s.str.; **chimaerica** Etayo: on *Pertusaria* [close to *Parapyrenis*, fide Etayo, pers. comm.]; **clauzadei** Nav.-Ros., Cl.Roux & Llimona: on *Squamarina*; **coarctatae** (B. de Lesd.) Hafellner & F.Berger: on *Trapelia*; **collematum** Nik.Hoffm. & Hafellner: on *Rostania ceranisca*; **constrictella** (Müll.Arg.) Hafellner: on *Gyalolechia bracteata*; **coppinsii** Etayo & Nav.-Ros.: on *Protopannaria pezizoides*; **elegantis** Hafellner: on *Rusavskia elegans*; **epidesertorum** Nav.-Ros.: on *Gyalolechia desertorum*; **epifulgens** Nav.-Ros. & Cl.Roux: on *Gyalolechia fulgens*; **epimarmorata** Nav.-Ros.: on *Xanthocarpia marmorata*; **epinashii** Nav.-Ros. & Etayo: on *Polycauliona nashii*; **gahavisukae** Diederich: on ?*Graphis*; **galligena** R.Sant. & Hafellner: on *Physcia*; **haematommata** R.C.Harris & Lendemer: on *Haematomma personii*; **heppiae** Cl.Roux: on *Heppia lutosae*; **hypanica** S.Y.Kondr., L.Lökös & J.-S.Hur: on *Endocarpion*; **hyperphysciae** Etayo: on *Hyperphyscia adglutinata*; **inconspectua** Hafellner: on *Lecidea berengeriana*; **lecidellae** Boqueras & Nav.-Ros.: on *Lecidella elaeochroma*; **lepidiotae** (Anzi) Etayo & Nav.-Ros.: on *Fuscopannaria praetermissa*; **makareviczae** S.Y.Kondr.: on *Lecanora* aff. *campestris*; **mediterraneae** Calat., Nav.-Ros. & E.Calvo: on *Fuscopannaria mediterranea*; **monegrina** Etayo: on terricolous *Polyblastia*; **obscuroides** (Linds.) Triebel & Rambold [= *L. thallina* (Cooke) Hafellner]: on *Phaeophyscia*, more rarely *Physcia*; **paucispora** Etayo & Nav.-Ros.: on *Bilimbia sabuletorum*; **physciicola** (Ihlen & R.Sant.) Hafellner: on *Physcia dubia*; **polycoccoides** Hafellner & R.Sant.: on *Physcia tribacia*; **pyrenodesmiae** Nav.-Ros. & Cl.Roux: on *Pyrenodesmia*; **rinodinae** Zhurb.: on *Rinodina*; **sinapispermae** Etayo & Nav.-Ros.: on *Bryoplaca sinapisperma*; **tertia** Etayo, Flakus & Rodr.Flakus: on *Rusavskia elegans*; **thorii** Zhurb.: on *Aspicilia moenium*; **verrucicola** (Wedd.) Nik.Hoffm. & Hafellner: on *Aspicilia calcarea*, *A. cinerea* and *A. contorta*; **wasseri** S.Y.Kondr.: on *Flavoplaca*; **weillii** (Werner) Hafellner & R.Sant.: on *Physcia* and *Physconia*; **xanthoriae** Triebel & Rambold: on *Leproplaca proteus* and *Rusavskia elegans*.

Lit.: Aptroot et al. 1997; Calatayud et al. 2000; Etayo 2010c, 2011, 2017; Etayo & Navarro-Rosinés 2008; Etayo & Sancho 2008; Etayo et al. 2013c; Hafellner 1989; Hafellner & Berger 2000; Hafellner & Zimmermann 2012; Hoffmann & Hafellner 2000; Ihlen & Wedin 2005; Kondratyuk et al. 2014, 2015; Lendemer et al. 2016; Navarro-Rosinés & Etayo 2001; Navarro-Rosinés et al. 1994, 1998a, 1998c; Navrotskaya et al. 1996; Roux & Triebel 1994; Triebel et al. 1991; Zhurbenko 2008b, 2013a; Zhurbenko & Brackel 2013.

Order **Sordariales** D.Hawksw. & O.E.Erikss.

Family **Helminthosphaeriaceae** Samuels, Cand. & Magni

Endophragmiella B.Sutton; type: *E. pallescens* B.Sutton. Mol.: yes. Asexual, hyphomycetous.
Species: 3-0-0 (70). **franconica** Brackel & Markovskaja: on *Cladonia*, *Platismatia glauca* and *Hypogymnia physodes*; **hughesii** D.Hawksw.: on *Lobaria pulmonaria*; **stordeuriana** U.Braun, Zhurb., Diederich, Tsurukau & Heuchert: on *Cladonia*.
Lit.: Brackel & Markovskaja 2009; Hawksworth 1979a; Zhurbenko et al. 2015d.

Order Sordariales genera incertae sedis

Globosphaeria D.Hawksw.; type: *G. jamesii*. Mol.: no.
Species: 1-0-0. **jamesii** D.Hawksw.: on *Normandina pulchella*.
Lit.: Hawksworth 1990b.

Reconditella Matzer & Hafellner; type: *R. physconiarum*. Mol.: no.
Species: 1-0-0. **physconiarum** Hafellner & Matzer: on *Physconia distorta* and *P. venusta*.
Lit.: Matzer & Hafellner 1990.

Roselliniomyces Matzer & Hafellner; type: *R. trichotheliorum*. Mol.: no.
Species: 2-0-0. **erinaceus** Etayo: on *Sticta*; **trichotheliorum** Matzer & Hafellner: on foliicolous *Trichothelium*.
Lit.: Etayo 2017; Matzer & Hafellner 1990.

Roselliniopsis Matzer & Hafellner; type: *R. groedensis*. Mol.: no.
Species: 7-0-0. **gelidaria** (Mudd) Matzer: on *Placopsis gelida*; **groedensis** (Zopf) Matzer & Hafellner: on *Varicellaria lactea*; **palicei** Etayo: on *Placopsis gelida*; **phaeophysciae** S.Y.Kondr., L.Lökös & J.-S.Hur: on *Phaeophyscia*; **tartaricola** (Leight.) Matzer: on *Lepra*, *Ochrolechia*, *Pertusaria pupillaris* and *Varicellaria hemisphaerica*; **tropica** Matzer & R.Sant.: on ?*Ochrolechia*; **ventosa** (Rostr.) Alstrup: on *Placopsis gelida*.
Lit.: Alstrup et al. 1994; Etayo 2003; Kondratyuk et al. 2013; Matzer 1993; Matzer & Hafellner 1990.

Subclass XYLARIOMYCETIDAE O.E.Erikss. & Winka

Order **Xylariales** Nannf.

Family **Hyponectriaceae** Petr.

Charonectria Sacc.; type: *C. consolationis* Sacc. Mol.: no.
Species: 1-0-0 (3). **amabilis** Lowen & D.Hawksw.: on *Phaeorrhiza*.
Lit.: Rossman et al. 1999.

Physalospora Niessl; type: *P. alpestris* Niessl. Mol.: yes.
Species: 2-0-0 (37). **collematis** (Stein) G.Winter: on *Collema* [a poorly known species]; **jonaspidis** (Stein) Vouaux: on *Ionaspis chrysophana* [a poorly known species].
Lit.: Hoffmann & Hafellner 2000.

Family **Hypoxylaceae** DC.

Hypoxylon Bull.; type: *H. fragiforme* (Pers.) J.Kickx f. [= *Sphaeria* Haller, nom. rejic.]. Mol.: yes (T).
Species: 1-0-0 (140). **Sphaeria sociella** Nyl.: on *Trapelia coarctata* [phylogenetic position uncertain].
Lit.: Triebel 1989.

Family **Xylariaceae** Tul. & C.Tul.

Anthostomella Sacc.; type: *A. limitata* Sacc. Mol.: yes. Currently heterogeneous.
Species: 1-0-0 (85). **apogyra** (Nyl.) Saccardo & D.Saccardo: on *Umbilicaria* [a poorly known species].
Lit.: Clauzade et al. 1989; Matzer & Hafellner 1990.

Class Sordariomycetes ordo incertae sedis

Order **Coniochaetales** Huhndorf, A.N.Mill. & F.A.Fernández

Family **Coniochaetaceae** Malloch & Cain

Coniochaeta (Sacc.) Cooke; type: *C. ligniaria*. Mol.: yes (T, L).
Species: 0-0-1 (80). **ligniaria** (Grev.) Masee: facultatively lichenicolous on *Diploschistes diacapsis*.
Lit.: Etayo 2008.

Subphylum Pezizomycotina ordo incertae sedis

Order **Thelocarpales** Lücking & Lumbsch

Family **Thelocarpaceae** Zukul

Thelocarpon Nyl.; type: *T. laureri* (Flot.) Nyl. (lichenized). Mol.: yes (T, L).
Species: 0-0-4 (25). **cyaneum** Olech & Alstrup: on '*Polyblastia cf. gothica*', probably facultatively lichenicolous; **epibolum** Nyl. var. **epibolum**: facultatively lichenicolous on *Arthrorhaphis*, *Baeomyces*, *Lichenomphalia hudsoniana*, *Peltigera* and *Solorina*; **epibolum** var. **epithallinum** (Leight.) G.Salisb.: facultatively lichenicolous on *Arthrorhaphis*, *Baeomyces*, *Catapyrenium*, *Peltigera*, *Protopannaria* and *Solorina*; **lichenicola** (Fuckel) Poelt & Hafellner: facultatively lichenicolous on *Baeomyces*, *Peltigera*, *Solorina* and other terricolous lichens.
Lit.: Olech & Alstrup 1990; Rambold & Triebel 1992.

Subphylum Pezizomycotina familiae incertae sedis

Family **Myxotrichaceae** Currah

Myxotrichum Kunze; type: *M. chartarum* Kunze. Mol.: yes (T).
Species: 0-0-1 (12). **bicolor** (Ehrenb.) Fr.: on dying thalli of
Usnea, possibly only fortuitously lichenicolous.
Lit.: Hawksworth 1979a.

Family **Obryzaceae** O.E.Erikss.

Obryzum Wallr.; type: *O. corniculatum*. Mol.: no.
Species: 3-0-0. **corniculatum** Wallr.: on *Scytinium*; **friesii**
(Keissl.) Nik.Hoffm. & Hafellner: on *Leptogium*; **strigulo-**
loides Aptroot & Sipman: on *Agonimia vouauxii*.
Lit.: Aptroot & Sipman 2001; Hoffmann & Hafellner 2000; Lücking
et al. 2017.

Subphylum Pezizomycotina genera incertae sedis

Acaroconium Kocourk. & D.Hawksw.; type: *A. punctiforme*.
Mol.: no. Asexual, pycnidial.
Species: 1-0-0. **punctiforme** Kocourk. & D.Hawksw.: on
Acarospora and *Sarcogyne*.
Lit.: Kocourková & Hawksworth 2008.

Actinocladium Ehrenb.; type: *A. rhodosporum*. Mol.: no.
Asexual, hyphomycetous.
Species: 0-0-1 (8). **rhodosporum** Ehrenb.: facultatively
lichenicolous on *Flavoparmelia*, *Hypotrachyna*, *Lecanora*,
Lepra and *Lepraria*.
Lit.: Brackel 2014.

Arborillus Munt.-Cvetk. & Gómez-Bolea; type: *A. ilimonaе*.
Mol.: no. Asexual, synnematosous.
Species: 1-0-0. **ilimonaе** Munt.-Cvetk. & Gómez-Bolea: on
Diploschistes.
Lit.: Muntañola-Cvetkovic & Gómez-Bolea 1998.

Asteroglobulus Brackel; type: *A. giselae*. Mol.: no. Asexual,
pycnidial.
Species: 2-0-0. **giselae** Brackel: on *Ramalina farinacea*;
pyramidalis (Etayo) Diederich, comb. nov.: on *Hypotra-*
chyna and *Parmotrema*.
Lit.: Brackel 2011a, Etayo 2010a.

Asterophoma D.Hawksw.; type: *A. mazaediicola*. Mol.: no.
Asexual, pycnidial.
Species: 1-0-0. **mazaediicola** D.Hawksw.: on *Calicium* and
Chaenotheca.
Lit.: Hawksworth 1981; Tibell 1991a.

Biciliopsis Diederich; type: *B. leptogiicola*. Mol.: no.
Species: 2-0-0. **cladoniae** Zhurb., Pino-Bodas & Diederich:
on *Cladonia*; **leptogiicola** Diederich: on *Leptogium*.
Lit.: Aptroot et al.1997; Hoffmann & Hafellner 2000; Zhurbenko &
Pino-Bodas 2017.

Bicoloromyces Heuchert, U.Braun & D.Hawksw.; type: *B.*
kyffinensis. Mol.: no. Asexual, hyphomycetous.

Species: 1-0-0. **kyffinensis** Heuchert, U.Braun &
D.Hawksw.: on *Lecanora fuscobrunnea* or *Lecidella*.
Lit.: Heuchert et al. 2015.

Calongeomyces D.Hawksw. & Etayo; type: *C. gibelluloides* [= *Calongia* D.Hawksw. & Etayo, nom. illeg.]. Mol.: no.
Asexual, hyphomycetous.
Species: 1-0-0. **gibelluloides** (D.Hawksw. & Etayo)
D.Hawksw. & Etayo: on *Cladonia*, *Flavoparmelia caperata*
and *Lepra amara*.
Lit.: Hawksworth & Etayo 2010, 2011.

Caeruleoconidia Zhurb. & Diederich; type: *C. ochrolechia*.
Mol.: no. Asexual, pycnidial.
Species: 2-0-0. **biazrovii** Zhurb.: on *Cladonia*; **ochrolechia**
Zhurb. & Diederich: on *Ochrolechia*.
Lit.: Zhurbenko & Pino-Bodas 2017; Zhurbenko et al. 2015a.

Carnegieispora Etayo & F.Berger; type: *C. rimeliae*. Mol.: no.
Asexual, pycnidial.
Species: 1-0-0. **rimeliae** Etayo & F.Berger: on *Parmotrema*.
Lit.: Etayo & Berger 2009.

Cecidiomyces U.Braun & Zhurb.; type: *C. santessonii*. Mol.: no.
Asexual, hyphomycetous.
Species: 1-0-0. **santessonii** U.Braun & Zhurb.: on *Stereo-*
caulon.
Lit.: Zhurbenko & Braun 2012.

Choreospora Constant. & R.Sant.; type: *C. tibellii*. Mol.: no.
Asexual, sporodochial.
Species: 1-0-0. **tibellii** Constant. & R.Sant.: on foliicolous
Echinoplaca.
Lit.: Constantinescu & Santesson 1987.

Cladoniicola Diederich, van den Boom & Aptroot; type: *C.*
staurospora. Mol.: no. Asexual, pycnidial.
Species: 2-0-0. **irregularis** Etayo: on *Diploschistes diacapsis*;
staurospora Diederich, van den Boom & Aptroot: on
Cladonia.
Lit.: Diederich et al. 2002a; Etayo 2010c.

Clauzadeomyces Diederich; type: *C. verrucosus*. Mol.: no.
Asexual, sporodochial.
Species: 1-0-0. **verrucosus** Diederich: on *Placopsis*.
Lit.: Diederich 1994.

Codonmyces Calat. & Etayo; type: *C. lecanorae*. Mol.: no.
Asexual, hyphomycetous.
Species: 1-0-0. **lecanorae** Calat. & Etayo: on *Lecanora*
valesiaca.
Lit.: Calatayud & Etayo 1999a.

Coniambigua Etayo & Diederich; type: *C. phaeographidis*. Mol.:
no. Asexual, pycnidial.
Species: 1-0-0. **phaeographidis** Etayo & Diederich: on
Phaeographis s.l. (incl. *Leiorreuma*).
Lit.: Etayo & Diederich 1995.

Cornutispora Piroz.; type: *C. limaciformis*. Mol.: no. Asexual,
pycnidial.
Species: 8-0-1. **ciliata** Kalb: on various lichens; **herteliana**
Knoph: on *Lecidella*; **intermedia** Punith. & D.Hawksw.: on
various lichens; **lichenicola** D.Hawksw. & B.Sutton: on

- various lichens; **limaciformis** Piroz.: facultatively lichenicolous on *Protoparmeliopsis muralis*; **ophiuospora** Etayo: on *Lobariella*; **pittii** D.Hawksw. & Punith.: on *Hypotrachyna*; **triangularis** Diederich & Etayo: on *Pertusaria pertusa*; **tricupulata** F.Berger & E.Zimm.: on *Physcia stellaris*.
Lit.: Etayo 2017; Etayo & Diederich 1995; Gierl & Kalb 1993; Hawksworth 1976, 1981; Knoph 2004; Punithalingam 2003; Sutton 1980; van den Boom & Etayo 2000; Zimmermann & Berger 2018.
- Deichmannia** Alstrup & D.Hawksw.; type: *D. verrucosa*. Mol.: no. Asexual, sporodochial.
Species: 1-0-0. **verrucosa** Alstrup & D.Hawksw.: on *Diploschistes*.
Lit.: Alstrup & Hawksworth 1990.
- Dictyophrynella** Bat. & Cavalc.; type: *D. bignoniacearum*. Mol.: no. Asexual, hyphomycetous.
Species: 1-0-0. **bignoniacearum** Bat. & Cavalc.: on foliicolous lichens.
Lit.: Hawksworth 1979a.
- Epaphroconidia** Calat. & V.Atiensa; type: *E. hawksworthii*. Mol.: no. Asexual, pycnidial.
Species: 1-0-0. **hawksworthii** Calat. & V.Atiensa: on *Pertusaria pertusa*.
Lit.: Calatayud & Atienza 1995.
- Everniicola** D.Hawksw.; type: *E. flexispora*. Mol.: no. Asexual, pycnidial.
Species: 1-0-0. **flexispora** D.Hawksw.: on *Evernia* and *Nephroma arcticum*.
Lit.: Hawksworth 1982a.
- Feltgeniomyces** Diederich; type: *F. luxemburgensis*. Mol.: no. Asexual, sporodochial.
Species: 4-0-0. **dichotomus** Etayo & Calat.: on *Physcia*; **luxemburgensis** Diederich: on *Lecidella*; **physciae** Etayo & Breuss: on *Physcia*; **uniseptatus** Diederich: on *Hypotrachyna*.
Lit.: Aptroot et al. 1997; Calatayud & Etayo 2001; Diederich 1990; Etayo & Breuss 1998.
- Fenestroconidia** Calat. & Etayo; type: *C. caloplacae*. Mol.: no. Asexual, sporodochial.
Species: 1-0-0. **caloplacae** Calat. & Etayo: on *Calogaya*.
Lit.: Calatayud & Etayo 1999b.
- Gyrophthorus** Hafellner & Sancho; type: *G. perforans*. Mol.: no. Species: 3-0-0. **crustulosae** (Creveld) Hafellner & Sancho: on *Umbilicaria*; **gracilis** Nik.Hoffm. & Hafellner: on *Umbilicaria*; **perforans** Hafellner & Sancho: on *Umbilicaria*.
Lit.: Hafellner & Sancho 1990; Hoffman & Hafellner 2000.
- Hawksworthiana** U.Braun; type: *H. peltigericola*. Mol.: no. Asexual, hyphomycetous.
Species: 1-0-0. **peltigericola** (D.Hawksw.) U.Braun: on *Peltigera*.
Lit.: Braun 1988; Hawksworth 1980a.
- Henfella** Halici, D.Hawksw., Z.Kocak. & M.Kocak.; type: *H. muriformis*. Mol.: no. Asexual, pycnidial.
Species: 1-0-0. **muriformis** Halici, D.Hawksw., Z.Kocak. & M.Kocak.: on *Candelariella antennaria*.
Lit.: Hawksworth et al. 2016.
- Hymenobia** Nyl.; type: *H. insidiosa* [= *Hymenobiella* Triebel; type: *H. aporea*]. Mol.: no. A poorly known genus.
Species: 1-0-0. **insidiosa** Nyl. [= *Hymenobiella aporea* (Nyl.) Triebel]: on *Lecidea*.
Lit.: Eriksson & Hawksworth 1991; Triebel 1989.
- Hypotrachynicola** Etayo; type: *H. rubra*. Mol.: no. Sexual.
Species: 1-0-0. **rubra** Etayo: on *Hypotrachyna*.
Lit.: Etayo 2002.
- Intralichen** D.Hawksw. & M.S.Cole; type: *I. christiansenii*. Mol.: yes (T, L). Asexual, hyphomycetous. Probably polyphyletic.
Species: 4-0-0. **baccisporus** D.Hawksw. & M.S.Cole: on *Calogaya*, *Flavoplaca*, *Gyalolechia*, *Xanthocarpia*, *Xanthomendoza* and other lichens; **christiansenii** (D.Hawksw.) D.Hawksw. & M.S.Cole [= *Bispora christiansenii* D.Hawksw.]; on *Candelariella* and other lichens; **lichenicola** (M.S.Christ. & D.Hawksw.) D.Hawksw. & M.S.Cole [= *Trimmatostroma lichenicola* M.S.Christ. & D.Hawksw.]; on *Candelariella* and other lichens; **lichenium** (Diederich) D.Hawksw. & M.S.Cole [= *Bispora lichenium* Diederich]: on various lichens.
Lit.: Diederich 1990; Hawksworth 1979a; Hawksworth & Cole 2002.
- Isthmoconidium** Etayo & F.Berger; type: *I. bacidiicola*. Mol.: no. Asexual, pycnidial.
Species: 1-0-0. **bacidiicola** Etayo & F.Berger: on *Bacidia*.
Lit.: Etayo & Berger 2013.
- Kalchbrenneriella** Diederich & M.S.Christ.; type: *K. cyanescens*. Mol.: no. Asexual, hyphomycetous.
Species: 1-0-0. **cyanescens** (Kalchbr.) Diederich & M.S.Christ.: on *Usnea*.
Lit.: Diederich 2002.
- Katherinomyces** Khodos.; type: *K. cetrariae*. Mol.: no. Asexual, coelomycetous, stromatic.
Species: 1-0-0. **cetrariae** Khodos: on *Cetraria aculeata*.
Lit.: Khodosovtsev et al. 2016, 2018.
- Keissleriomyces** D.Hawksw.; type: *K. sandstedeanus*. Mol.: no. Asexual, pycnidial.
Species: 1-0-0. **sandstedeanus** (Keissler) D.Hawksw.: on *Cladonia*.
Lit.: Hawksworth 1981.
- Lambinonia** Sérus. & Diederich; type: *L. strigulae*. Mol.: no. Asexual, sporodochial.
Species: 1-0-0. **strigulae** (Elenkin & Woron.) Sérus. & Diederich: on foliicolous *Strigula*.
Lit.: Sérusiaux & Diederich 2005.
- Lawalreea** Diederich; type: *L. lecanorae*. Mol.: no. Asexual, pycnidial. Resembles pycnidia of some *Lecanora* s.l.
Species: 1-0-0. **lecanorae** Diederich: on *Myriolecis persimilis* and other *Myriolecis* species.
Lit.: Diederich 1990.
- Leightoniomyces** D.Hawksw. & B.Sutton; type: *L. phillipsii*. Mol.: no. Asexual, hyphomycetous.

Species: 2-0-0. **canariensis** Etayo & Pérez-Vargas: on crustose saxicolous lichens; **phillipsii** (Berk. & Leight.) D.Hawksw. & B.Sutton: on *Steinia geophana* and *Thrombium epigaeum*, possibly algicolous.
Lit.: Hawksworth 1977a, 1979a; Pérez-Vargas et al. 2013.

Lichenobactridium Diederich & Etayo; type: *L. pertusariae*. Mol.: no. Asexual, sporodochial.
Species: 1-0-0. **pertusariae** Diederich & Etayo: on *Pertusaria pertusa*.
Lit.: Etayo & Diederich 1995.

Lichenohendersonia Calat. & Etayo; type: *L. squamarinae*. Mol.: no. Asexual, pycnidial.
Species: 3-0-0. **squamarinae** Calat. & Etayo: on *Squamarina*; **uniseptata** Etayo & Calat.: on *Parmelia* and *Parmelina*; **varians** Calat. & Etayo: on *Rhizoplaca*.
Lit.: Calatayud & Etayo 2001.

Lichenopenicillus Etayo; type: *L. versicolor*. Mol.: no. Asexual, synnematus.
Species: 1-0-0. **versicolor** Etayo: on *Sticta* and *Leptogium*.
Lit.: Etayo 2017.

Lichenophoma Keissl.; type: *L. haematommatis*. Mol.: no. Asexual, pycnidial. A poorly known genus.
Species: 1-0-0 (2). **haematommatis** Keissl.: on *Haematomma*.
Lit.: Hawksworth 1981.

Lichenopuccinia D.Hawksw. & Hafellner; type: *L. poeltii*. Mol.: no. Asexual, sporodochial.
Species: 1-0-0. **poeltii** D.Hawksw. & Hafellner: on *Parmelia*.
Lit.: Hawksworth 1984.

Lichenostella Calat. & Etayo; type: *L. hypotrachynae*. Mol.: no. Asexual, sporodochial.
Species: 1-0-0. **hypotrachynae** Etayo & Calat.: on *Hypotrachyna*.
Lit.: Calatayud & Etayo 1999a.

Milospium D.Hawksw.; type: *M. graphideorum*. Mol.: yes (T). Asexual, hyphomycetous.
Species: 2-0-0 (4). **graphideorum** (Nyl.) D.Hawksw.: on *Dirina massiliensis*, sometimes lichenized; **lacoizquetae** Etayo & Diederich: on *Cladonia* [often co-occurring with *Arthonia digitatae*].
Lit.: Crous et al. 2015; Etayo & Diederich 1996a; Hawksworth 1975, 1979a.

Minutophoma D.Hawksw.; type: *M. chrysophthalmae*. Mol.: no. Asexual, pycnidial.
Species: 1-0-0. **chrysophthalmae** D.Hawksw.: on *Chrysothrix chrysophthalmae*.
Lit.: Hawksworth 1981.

Neolamyia Theiss. & Syd.; type: *N. peltigerae*. Mol.: no. Sexual.
Species: 3-0-0. **ahtii** Zhurb.: on *Cladonia*; **peltigerae** (Mont.) Theiss. & Syd.: on *Peltigera* (mainly *P. didactyla*); **xanthoparmeliae** Kocourk.: on *Xanthoparmelia conspersa*.
Lit.: Keissler 1930; Kocourková 2009; Zhurbenko & Pino-Bodas 2017.

Nigromacula Etayo; type: *N. hypotrachynae*. Mol.: no. Asexual, sporodochial.

Species: 1-0-0. **uniseptata** (D.Hawksw.) D.Hawksw. [= *Vouauxiella u.* D.Hawksw.; = *N. hypotrachynae* Etayo]: on *Hypotrachyna*.
Lit.: Etayo 2002.

Nigropuncta D.Hawksw.; type: *N. rugulosa*. Mol.: no. Asexual, pycnidial.
Species: 2-0-0. **groenlandica** Alstrup: on crustose lichen; **rugulosa** D.Hawksw.: on *Bellemerea*.
Lit.: Alstrup 1993a; Hawksworth 1981; Hawksworth & Poelt 1986.

Patriciomyces D.Hawksw.; type: *P. valentinianus*. Mol.: no. Asexual, hyphomycetous.
Species: 1-0-0. **valentinianus** D.Hawksw.: on *Physcia*.
Lit.: Cole & Hawksworth 2001.

Psammia Sacc. & M.Rousseau; type: *P. bommeriae* M.Rousseau & Sacc. Mol.: no. Asexual, hyphomycetous.
Species: 3-0-0 (8). **inflata** Earl.-Benn. & D.Hawksw.: on *Lepraria* and corticolous algae; **simplex** Earl.-Benn. & D.Hawksw.: on various corticolous lichens and algae; **stipitata** D.Hawksw.: on various corticolous lichens and algae.
Lit.: Earland-Bennett & Hawksworth 1999a; Hawksworth 1979a.

Pycnopsammia Diederich & Etayo; type: *P. lobariae*. Mol.: no. Asexual, pycnidial.
Species: 1-0-0. **lobariae** Diederich & Etayo [= *Psammia lobariae* (Diederich & Etayo) Earl.-Benn. & D.Hawksw.]: on *Lobaria pulmonaria*.
Lit.: Etayo & Diederich 1995.

Pygmaeosphaera Etayo & Diederich; type: *P. coccocarpiae*. Mol.: no. Possibly related to Tubeufiales.
Species: 3-0-0. **coccocarpiae** (Diederich) Etayo & Diederich [= *Nectriopsis coccocarpiae* Diederich]: on *Coccocarpia*; **epigraphis** Etayo: on *Graphis*; **sipmaniana** Etayo: on *Parmeliella*.
Lit.: Etayo 2017.

Refractohilum D.Hawksw.; type: *R. galligenum*. Mol.: no. Asexual, hyphomycetous.
Species: 5-0-0. **achromaticum** (B.Sutton) D.Hawksw.: on *Gyalecta*; **galligenum** D.Hawksw.: on *Nephroma laevigatum*; **intermedium** Cl.Roux & Etayo: on *Gyalecta*; **peltigerae** (Keissl.) D.Hawksw.: on *Peltigera*; **pluriseptatum** Etayo & Cl.Roux: on *Gyalecta*, possibly also on *Nephroma antarcticum*.
Lit.: Etayo & Sancho 2008; Hawksworth 1977a, 1979a; Roux et al. 1997.

Sarcoexcipula Etayo; type: *S. pannariae*. Mol.: no. Sexual.
Species: 1-0-0. **pannariae** Etayo: on *Pannaria pallida*.
Lit.: Etayo & Sancho 2008.

Sessiliospora D.Hawksw.; type: *S. bicolor*. Mol.: no. Asexual, hyphomycetous.
Species: 1-0-0. **bicolor** D.Hawksw.: foliicolous lichens.
Lit.: Hawksworth 1979a.

Spilium Nyl.; typification not clear. Mol.: no. Asexual, sporodochial.
Species: 0-1-0. **auratum** Sm.: lichenized, facultatively lichenicolous on *Dirina* spp.
Lit.: Giavarini & Purvis 2009b.

Stellifraga Alstrup & Olech; type: *S. cladonicola*. Mol.: no. Sexual.

Species: 1-0-0. **cladonicola** Alstrup & Olech: on *Cladonia*.
Lit.: Alstrup & Olech 1993.

Stygiomyces Coppins & S.Y.Kondr.; type: *S. galliformis*. Mol.: no. Asexual, pycnidial.

Species: 1-0-0. **galliformis** Coppins & S.Y.Kondr.: on *Pseudocyphellaria*.
Lit.: Coppins & Kondratyuk 1995.

Taeniolina M.B.Ellis; type: *T. centaurii* (Fuckel) M.B.Ellis. Mol.: no. Asexual, hyphomycetous.

Species: 0-0-1 (4). **scripta** (P.Karst) P.M.Kirk: facultatively lichenicolous on corticolous lichens.
Lit.: Diederich 1989; Hawksworth 1979a; Heuchert et al. 2018.

Talpapellis Alstrup & M.Cole; type: *T. peltigerae*. Mol.: no. Asexual, hyphomycetous.

Species: 5-0-0. **beschiana** (Diederich) Zhurb., U.Braun, Diederich & Heuchert [≡ *Taeniolella beschiana* Diederich; = *Ameroconium cladoniae* U.Braun & Zhurb.]: on *Cladonia*; **mahensis** Diederich, U.Braun & Ertz: on crustose lichen with *Trentepohlia*; **peltigerae** Alstrup & M.S.Cole var. **peltigerae**: on *Peltigera venosa*; **peltigerae** Alstrup & M.S.Cole var. **rossica** Heuchert, Zhurb. & U.Braun: on *Peltigera* spp.; **solorinae** Zhurb., Heuchert & U.Braun: on *Solorina crocea*.

Lit.: Alstrup & Cole 1998; Diederich 1992; Diederich et al. 2017; Heuchert et al. 2014, 2018; Zhurbenko & Braun 2013; Zhurbenko et al. 2015c.

Teratosperma Syd. & P.Syd.; type: *T. singulare* Syd. & P.Syd. Mol.: no. Asexual, hyphomycetous.

Species: 2-0-0 (14). **anacardii** Hansf.: on foliicolous lichens; **lichenicola** D.Hawksw.: on foliicolous lichens.
Lit.: Hawksworth 1979a.

Trichoconis Clem.; type: *T. caudata* (Appel & Strunk) Clem. Mol.: yes. Asexual, hyphomycetous.

Species: 3-0-0 (21). **hafellneri** U.Braun, Khodos., Darmos-tuk & Diederich: on *Athallia pyracea* and *Xanthoria parietina*; **lichenicola** D.Hawksw.: on *Peltigera collina*; **physciicola** Brackel: on *Physcia*.

Lit.: Brackel 2014; Braun et al. 2016; Hawksworth 1980b.

Vagnia D.Hawksw. & Miądl.; type: *V. cirriformis*. Mol.: no. Asexual, coelomycetous.

Species: 1-0-0. **cirriformis** D.Hawksw. & Miądl. [as 'cirriformia']: on *Peltigera*.
Lit.: Hawksworth & Miądlkowska 1997b.

Verrucaster Tobler; type: *V. lichenicola*. Mol.: no. Asexual, pycnidial. A poorly known taxon.

Species: 1-0-0. **lichenicola** Tobler: on *Cladonia*.
Lit.: Hawksworth 1981.

Viridiannula Etayo; type: *V. pertusariae*. Mol.: no. Asexual, pycnidial.

Species: 1-0-0. **pertusariae** Etayo: on *Pertusaria pertusa*.
Lit.: Etayo 2002b.

Vouauxiella Petr. & Syd.; type: *V. verrucosa*. Mol.: no. Asexual, pycnidial.

Species: 3-0-0. **lichenicola** (Linds.) Petrak & H.Sydow: on *Lecanora*; **pithospora** (Cavalc. & Silva) B.Sutton: on foliicolous lichens; **verrucosa** (Vouaux) Petrak & H.Sydow: on *Lecanora*.

Lit.: Hawksworth 1981.

Zevadia J.C.David & D.Hawksw.; type: *Z. peroccidentalis*. Mol.: no. Asexual, hyphomycetous.

Species: 1-0-0. **peroccidentalis** J.C.David & D.Hawksw.: on *Usnea*.

Lit.: David & Hawksworth 1995.

Zwackhiomacromyces Etayo & van den Boom; type: *Z. constrictocarpus*. Mol.: no. Sexual.

Species: 2-0-0. **constrictocarpus** Etayo & van den Boom: on *Megalospora verrucosa*; **hyalosporus** (Alstrup, D.Hawksw. & R.Sant.) Etayo & F.Berger [≡ *Pyrenidium hyalosporum* Alstrup, D.Hawksw. & R.Sant.]: on *Placopsis*.

Lit.: Alstrup & Hawksworth 1990; van den Boom & Etayo 2014.

Phylum BASIDIOMYCOTA R.T.Moore

Subphylum PUCCINIOMYCOTINA R.Bauer, Bergerow, J.P.Samp., M.Weiss & Oberw.

Order Agaricostilbales Oberw. & R.Bauer

Family Chionosphaeraceae Oberw. & Bandoni

Chionosphaera D.E.Cox; type: *C. apobasidialis* D.E.Cox (saprotrophic). Mol.: yes (T).

Species: 2-0-0 (6). **coppinsii** P.Roberts: on various lichens; **lichenicola** Alstrup, Sutton & Tønberg: on various lichens.
Lit.: Diederich 1996; Kirschner et al. 2001; Roberts 1997.

Order Cyphobasidiales T.Sprib. & H.Mayrhofer

Family Cyphobasidiaceae T.Sprib. & H.Mayrhofer

Cyphobasidium Millanes, Diederich & Wedin; type: *C. hypogymniicola*. Mol.: yes (T, L). Sexual stage in galls, yeast stage asymptomatic in lichen cortex; DNA sequences of many unnamed species obtained from the cortex of macrolichens, especially of Parmeliaceae.

Species: 2-0-0. **hypogymniicola** (Diederich & Ahti) Millanes, Diederich & Wedin [≡ *Cystobasidium hypogymniicola* Diederich & Ahti]: on *Hypogymnia*; **usneicola** (Diederich & Alstrup) Millanes, Diederich & Wedin [≡ *Cystobasidium usneicola* Diederich & Alstrup]: on *Usnea* [consists of two genetically distinct species].

Lit.: Diederich 1996; Diederich & Christiansen 1994; Millanes et al. 2016a; Spribille et al. 2016.

Subphylum AGARICOMYCOTINA Doweld [= Basidiomycotina Ainsw.]

Class TREMELLOMYCETES Doweld

Order **Filobasidiales** JülichFamily **Filobasidiaceae** L.S.Olive

Heterocephalacria Berthier; type: *H. solida* Berthier. Mol.: yes (T, L).

Species: 2-0-0 (4). **bachmannii** (Diederich & M.S.Christ.) Millanes & Wedin [\equiv *Syzygospora bachmannii* Diederich & M.S.Christ.]: on *Cladonia*; **physciacearum** (Diederich) Millanes & Wedin [\equiv *S. physciacearum* Diederich]: on *Leucodermia*, *Physcia*, *Physconia* and *Polyblastidium*, also reported from *Phaeophyscia*.

Lit.: Diederich 1996; Liu et al. 2016.

Syzygospora G.W.Martin; type: *S. alba* G.W.Martin. Mol.: yes (T).

Species: 1-0-0 (3). **parmeliicola** Diederich: on *Hypotrachyna* [phylogenetic position unknown].

Lit.: Diederich 1996.

Order **Tremellales** Fr.Family **Tremellaceae** Fr.

Biatoropsis Räsänen; type: *B. usnearum*. Mol.: yes (T, L).

Species: 4-0-0. **hafellneri** Millanes, Diederich, M.Westb. & Wedin: on *Usnea fragiliscens* aggr., mainly *U. cornuta*; **minuta** Millanes, Diederich, M.Westb. & Wedin: on *Usnea barbata* and *U. lapponica*; **protousneae** Millanes, Diederich, M.Westb. & Wedin: on *Protousnea dusenii*; **usnearum** Räsänen s.str.: on *Usnea* (incl. *U. flavocardia*, *U. florida/subfloridana*, *U. fragiliscens*, *U. glabrescens*, *U. cf. krogiana* and *U. macaronesica*); in continental Europe so far only on *U. florida/subfloridana*.

Lit.: Diederich 1996; Diederich & Christiansen 1994; Millanes et al. 2014b, 2016b.

Tremella Pers. s.l.; type: *T. mesenterica* (Schaeff.) Retz. Mol.: yes (T, L). All lichenicolous species sexual, often with asexual stage.

Species: 60-0-0 (250). **anaptychia** J.C.Zamora & Diederich: on *Anaptychia ciliaris*; **caloplacae** (Zahlbr.) Diederich s.l.: on *Caloplaca* s.l. and *Xanthoria*; **candelariellae** Diederich & Etayo: on *Candelariella*; **celata** J.C.Zamora, Millanes, V.J.Rico & Pérez-Ortega: on *Ramalina fraxinea*; **cephalodiicola** Diederich: on *Psoroma*; **cetrariellae** Millanes, Diederich, M.Westb., Pippola & Wedin: on *Cetraria delisei*; **cetrariicola** Diederich & Coppins: on *Nephromopsis*; **christiansenii** Diederich: on *Physcia*; **cladoniae** Diederich & M.S.Christ.: on *Cladonia*; **coccocarpiiae** Diederich: on *Coccocarpia*; **coppinsii** Diederich & G.Marson: on *Platismatia*; **dendrogaphae** Diederich & Tehler: on *Dendrographa*; **diederichiana** Pérez-Ortega, Millanes, Wedin, V.J.Rico & J.C.Zamora: on *Lecidea* aff. *erythrophaea*; **diploschistina** Millanes, M.Westb., Wedin & Diederich: on *Diploschistes*; **dirinariae** Diederich, Millanes & Wedin: on *Dirinaria aegialita*; **endosporogena** J.C.Zamora, Millanes, V.J.Rico & Pérez-Ortega: on *Lecanora carpinea* (apothecia); **everniae** Diederich: on *Evernia mesomorpha*; **graphidastrae** Diederich: on *Graphidastra*; **graphidis** Diederich, Millanes & Wedin: on *Graphis*; **haematommatis** Diederich: on *Haematomma*; **harrisii** Diederich: on *Polymeridium* and *Trypethelium*; **huuskonenii** Diederich, Myllys, Goward & Lindgren: hyperparasitic on

Raesaenenia huuskonenii over *Bryoria*; **hypocenomycis** Diederich: on *Hypocenomycis*; **hypogymniae** Diederich & M.S.Christ.: on *Hypogymnia*; **leptogii** Diederich: on *Leptogium*; **lethariae**: on *Letharia vulpina*; **lichenicola** Diederich: on *Violella fucata*; **lobariacearum** Diederich & M.S.Christ.: on *Lobaria* and *Pseudocyphellaria*; **macrobasidiata** J.C.Zamora, Pérez-Ortega & V.J.Rico: on *Lecanora*; **macroceratis** Diederich & Hafellner: on *Cladonia*; **mayrhoferi** J.C.Zamora, Millanes, Etayo & Wedin: on *Lecanora allophana*; **microcarpa** Diederich: on cf. *Megalospora*; **monospora** Diederich: on *Leptogium*; **montis-wilhelmii** Diederich: on *Normandina simodense*; **nashii** Diederich: on *Usnea*; **nephromatis** Diederich: on *Nephroma*; **normandinae** Diederich: on *Normandina pulchella*; **nieblae** Diederich: on *Niebla*; **papua** Diederich: on *Hypogymnia*; **parmeliarum** Diederich: on *Parmotrema*; **parmeliellae** Diederich & Sérusiaux: on *Parmeliella*; **pertusariae** Diederich: on *Pertusaria*; **phaeographidis** Diederich, Coppins & Bandoni: on *Phaeographis*; **phaeographinae** Diederich & Aptroot: on '*Phaeographina*'; **phaeophysciae** Diederich & M.S.Christ.: on *Phaeophyscia*; **protoparmeliae** Diederich & Coppins: on *Protoparmelia*; **psoroglaenae** Diederich: on *Psoroglaena*; **psoromicola** Diederich: on *Psoroma*; **pyrenulae** Diederich, Millanes, Wedin & Common: on *Pyrenula*; **ramalinae** Diederich: on *Ramalina*; **rhizocarpicola** Diederich, Millanes & Wedin: on *Rhizocarpus*; **rinodinae** Diederich & M.S.Christ.: on *Rinodina*; **santessonii** Diederich: on *Usnea*; **stevensiana** Diederich: on *Usnea*; **stictae** Diederich: on *Dendriscoaulon* and *Sticta*; **sulcaria** Diederich & M.S.Christ.: on *Sulcaria*; **umbilicariae** Diederich & Millanes: on *Umbilicaria*; **tuckeriae** Diederich: on *Ramalina*; **variae** Pérez-Ortega, Millanes, V.J.Rico & J.C.Zamora: on *Lecanora varia*; **wirthii** Diederich: on *Protoparmelia*.

Lit.: Ariyawansa et al. 2015; Diederich 1996, 2003, 2004d, 2007a, 2007b; Diederich et al. 2014b; Etayo 2018a; Lindgren et al. 2015; Sérusiaux et al. 2003; Millanes et al. 2011, 2012, 2014a, 2015; Werth et al. 2013; Zamora et al. 2016, 2017.

Class Tremellomycetes familia incertae sedis

Family **Heteroacanthellaceae** P.Roberts

Heteroacanthella Oberw.; type: *H. variabilis* Oberw. & Langer. Mol.: yes (T).

Species: 1-0-0 (3). **ellipsospora** J.C.Zamora, Pérez-Ortega & V.J.Rico: on *Lecanora carpinea*.

Lit.: Zamora et al. 2014.

Class AGARICOMYCETES Doweld

Order **Agaricales** Underw.Family **Hygrophoraceae** LotsySubfamily **Lichenomphaloideae** Lücking & Redhead

Arrhenia Fr.; type: *A. auriscalpia* (Fr.) Fr. (bryophylous). Mol.: yes (T, L). Most species bryophylous or phycophilous.

Species: 1-0-0 (40). **peltigerina** (Peck) Redhead, Lutzoni, Moncalvo & Vilgalys [= *Omphalina p.* (Peck) P.Collin]: on *Peltigera*.

Lit.: Barrasa & Rico 2010; Collin & Lauron 1994; Garnier-Delcourt 2008; Orton 1977; Redhead et al. 2002; Santesson 1993a.

Eonema Redhead, Lücking & Lawrey; type: *E. pyriforme*. Mol.: yes (T, L).

Species: 0-0-1. **pyriforme** (M.P.Christ.) Redhead, Lücking & Lawrey [= *Athelia pyriformis* (M.P.Christ.) Jülich]: facultatively lichenicolous on *Cetraria aculeata*.

Lit.: Khodosovtsev et al. 2018.

Family Tricholomataceae Lotsy

Gamundia Raitelh.; type: *G. pseudoclusilis* (Joss. & Konrad) Raitelh. (saprotrophic) [possibly a synonym of *G. striatula* (Kühner) Raitelh.]. Mol.: yes. *G. leucophylla* (Fr.) H.E.Bigelow and *G. xerophila* (Lüthi & Röllin) Raitelh. are only doubtfully lichenicolous on moribund *Peltigera*.

Species: 0-0-1 (10). **striatula** (Kühner) Raitelh.: facultatively lichenicolous on *Cladonia* and *Peltigera*.

Lit.: Alstrup & Hawksworth 1990; Barrasa & Rico 2010; Moreau 2005.

Order Atheliales Jülich

Family Atheliaceae Jülich

Athelia Pers.; type: *A. epiphylla*. Mol.: yes (T, L). Sexual and asexual (sclerotia-forming).

Species: 0-0-4 (100). **alnicola** (Bourd. & Galz.) Jülich: facultatively lichenicolous; **arachnoidea** (Berk.) Jülich: frequently lichenicolous, on various lichens, also over bryophytes or bark; **epiphylla** Pers.: facultatively lichenicolous; **salicum** Pers.: facultatively lichenicolous.

Lit.: Arvidsson 1976, 1978; Jülich 1972; Lawrey et al. 2007; Parmasto 1998.

Order Boletales E.-J.Gilbert

Family Coniophoraceae Ulbr.

Leucogyrophana Pouzar; type: *L. mollusca* (Fr.) Pouzar (saprotrophic). Mol.: yes (T, L). Sexual and asexual (sclerotia-forming).

Species: 1-0-0 (10). **lichenicola** Thorn, Malloch & Ginns: on *Cladonia* and *Stereocaulon*.

Lit.: Lawrey et al. 2007; Thorn et al. 1998.

Order Cantharellales Gäum.

Order Cantharellales genera incertae sedis

Adamflakia Diederich & Lawrey; type: *A. applanata* [= *Bulbilla appplanata*] Diederich, Flakus & Etayo, nom. inval.; type: *B. appplanata*. Mol.: yes (T, L). Asexual (bulbil-forming).

Species: 1-0-0. **appplanata** Diederich & Lawrey [= *Bulbilla appplanata* Diederich, Flakus & Etayo, nom. inval.]: on Peltigerales.

Lit.: Diederich et al. 2014a; Lawrey et al. 2016.

Burgella Diederich & Lawrey; type: *B. flavoparmeliae*. Mol.: yes (T, L). Asexual (bulbil-forming).

Species: 1-0-1. **flavoparmeliae** Diederich & Lawrey: on *Flavoparmelia baltimorensis*; **lutea** Diederich, Capdet, A.I.Romero & Etayo: facultatively lichenicolous over various lichens.

Lit.: Diederich & Lawrey 2007; Diederich et al. 2014a; Lawrey et al. 2007.

Burgellopsis Diederich & Lawrey; type: *B. nivea*. Mol.: yes (T, L). Asexual (bulbil-forming).

Species: 1-0-0. **nivea** Diederich & Lawrey: on sterile, crustose lichen.

Lit.: Diederich et al. 2014a.

Burgoa Goid.; type: *B. verzuoliana* Goid. (saprotrophic). Mol.: yes (T, L). Asexual (bulbil-forming). Related to *Sistotrema* Fr. s.l. (sexual)

Species: 1-0-0 (7). **angulosa** Diederich, Lawrey & Etayo: on various lichens.

Lit.: Diederich & Lawrey 2007; Lawrey et al. 2007.

Ceratobasidium D.P.Rogers; type: *C. calosporum* S.P.Rogers (saprotrophic). Mol.: yes (L). Sexual and asexual (sclerotia/bulbil-forming).

Species: 1-0-0 (10). **bulbillifaciens** Diederich & Lawrey: on various lichens.

Lit.: Diederich et al. 2014a.

Minimedusa Weresub & P.M.LeClair; type: *M. polyspora* (Hotson) Weresub & P.M.LeClair (saprotrophic). Mol.: yes (T, L). Asexual (bulbil-forming).

Species: 1-0-0 (3). **pubescens** Diederich, Lawrey & Heylen: on various lichens.

Lit.: Diederich & Lawrey 2007; Lawrey et al. 2007.

Neoburgoa Diederich, E.Zimm. & Lawrey; type: *N. freyi*. Mol.: yes (T, L). Asexual (bulbil-forming).

Species: 1-0-0. **freyi** Diederich, E.Zimm. & Lawrey: on *Cladonia rangiferina*.

Lit.: Lawrey et al. 2016.

Order Corticiales K.-H.Larss.

Family Corticiaceae Herter

Corticium Pers.; type: *C. roseum* Pers. Mol.: yes (T, L). Sexual. Species: 1-0-0 (20). **silviae** Diederich, E.Zimm. & Lawrey: on *Thamnolia*.

Lit.: Diederich et al. 2018.

Erythricium J.Erikss. & Hjortstam; type: *E. laetum* (P.Karst.) J.Erikss. & Hjortstam (saprotrophic) [= *Marchandiobasidium* Diederich & Schultheis; type: *M. aurantiacum*]. Mol.: yes (T, L). Sexual and asexual (bulbil-forming).

Species: 1-0-0 (7). **aurantiacum** (Lasch) D.Hawksw. & A.Henrici [= *Marchandiomyces aurantiacus* (Lasch) Diederich & Etayo; = *Marchandiobasidium aurantiacum*

Diederich & Schultheis]: on *Physcia* and rarely other lichens.

Lit.: Diederich 1990; Diederich & Lawrey 2007; Diederich et al. 2003; Hawksworth & Henrici 2015; Lawrey et al. 2008.

Laetisaria Burds.; type: *L. fuciformis* (McAlpine) Burds. (graminicolous). Mol.: yes (T, L). Sexual or asexual (bulbil-forming).

Species: 2-0-0 (7). **buckii** (Diederich & Lawrey) Diederich, Lawrey & Ghobad-Mejhad [\equiv *Marchandiomyces buckii* Diederich & Lawrey]: on various lichens; **lichenicola** Diederich, Lawrey & Van den Broeck: on *Physcia*.

Lit.: Diederich & Lawrey 2007; Diederich et al. 2011a.

Lawreyomyces Lücking & Moncada; type: *L. palicei*. Mol.: yes (T, L). Sexual, asexual, hyphal and yeast stages unknown. Endolichenic. Cannot be detected or identified without DNA sequences. Not validly published (Hawksworth et al. 2017). DNA sequences obtained from the host of the generic type (*Agonimia foliacea*) led previous authors to erroneously conclude that the host was a lichenized member of Corticiaceae.

Species: 7-0-0. **bogotensis** Lücking & Moncada: endolichenic in *Normandina* sp.; **columbiensis** Lücking & Moncada: endolichenic in *Normandina columbiensis*; **confusus** Lücking & Moncada: endolichenic in *Normandina* aff. *columbiensis*; **foliaceae** Lücking & Moncada: endolichenic in *Agonimia foliacea*; **palicei** Lücking & Moncada: endolichenic in *Agonimia foliacea*; **pulchellae** Lücking & Moncada: endolichenic in *Normandina pulchella*; **spribillei** Lücking & Moncada: endolichenic in *Agonimia foliacea*.

Lit.: Lücking & Moncada 2017.

Marchandiomyces Diederich & D.Hawksw.; type: *M. corallinus*. Mol.: yes (T, L). Asexual (bulbil-forming).

Species: 1-0-0 (3). **corallinus** (Roberge) Diederich & D.Hawksw.: on various lichens.

Lit.: Diederich & Lawrey 2007; Etayo & Diederich 1996a; Hawksworth 1979a; Lawrey et al. 2007; Sikaroodi et al. 2001.

NOMENCLATURE AND TAXONOMIC NOVELTIES

After the revision of the genus *Didymocyrtis*, including now many species that have a former *Phoma* species as the asexual stage (Ertz et al. 2015), it became obvious that both *Phoma lobariae* and *P. psoromatis* do not belong there. Instead, the morphological characters of both perfectly fit the current circumscription of *Abrothallus*, including species mainly known from the asexual stage that were formerly described in *Vouauxiomyces*. The two following new combinations become therefore necessary.

Abrothallus lobariae (Diederich & Etayo) Diederich & Ertz, comb. nov.

BASIONYM: *Phoma lobariae* Diederich & Etayo, in Etayo & Diederich, Flechten Follmann, Contributions to Lichenology in Honour of Gerhard Follmann: 213 (1995)

MYCOBANK MB 827766

Abrothallus psoromatis (Zhurb. & U.Braun) Diederich & Zhurb., comb. nov.

BASIONYM: *Phoma psoromatis* Zhurb. & U.Braun, Lichenologist 45: 587 (2013)

MYCOBANK MB 827767

Arthonia polydactylonis Diederich & Ertz, nom. nov.

REPLACED SYNONYM: *Arthonia ceracea* Etayo & Breuss, Österr. Z. Pilzk. 7: 206 (1998) nom. illeg. non *Arthonia ceracea* Fée, Essai Crypt. Ecorces Exot. Offic., Suppl. Révis. (Paris): 42 (1837)

MYCOBANK MB 827768

TYPE: CANADA. BRITISH COLUMBIA: Wells Gray Provincial Park, Trophy Mountain Recreation Area, 51°46'N, 119°54'W, 1800-1900 m, on *Peltigera polydactylon*, 24 Aug. 1994. O. Breuss 10.658 (LI-holotype, UPS-isotype, non vid.).

Asteroglobulus pyramidalis (Etayo) Diederich, comb. nov.

BASIONYM: *Cornutispora pyramidalis* Etayo, Opuscula Philolichenum 8: 134 (2010)

MYCOBANK MB 827769

Based on the original description and a further specimen studied by us, this species does not belong to *Cornutispora*, but is a typical member of *Asteroglobulus*.

Specimen examined: AZORES. SAO MIGUE: Furnas, on the shore of Lagoa das Furnas, on bark of *Cryptomeria japonica*, on *Parmotrema robustum*, 30 July 2010, P. Diederich 16968 (herb. Diederich).

Bachmanniomyces D.Hawksw., Bull. Brit. Mus. (Nat. Hist.), Bot. 9: 10 (1981); type: *B. uncialicola* (Zopf) D.Hawksw.

SYN. NOV.: *Phaeopyxis* Rambold & Triebel, Notes Roy. Bot. Gard. Edinburgh 46: 380 (1990); type *P. punctum* (A.Massal.) Rambold, Triebel & Cop-pins

Pino-Bodas et al. (2017) included the type species of both genera in a molecular phylogenetic analysis and found that both cluster together in a well-supported clade within the Ostropomycetidae, and their results suggested that *Bachmanniomyces uncialicola* represents the asexual stage of *Phaeopyxis punctum*. Consequently, we consider both

species and both genera to be synonymous. As *Bachmanniomyces* (1981) predates *Phaeopyxis* (1990), and after the deletion of Art. 57.2 in the new Shenzhen Code (ICN), the name *Bachmanniomyces* has to be used for this genus in the absence of a formal conservation proposal. The following new combinations and synonymy become therefore necessary:

Bachmanniomyces australis (Rambold & Triebel)
Diederich & Pino-Bodas, comb. nov.

BASIONYM: *Phaeopyxis australis* Rambold & Triebel,
Notes Roy. Bot. Gard. Edinburgh 46: 381 (1990)
MYCOBANK MB 827770

Bachmanniomyces carniolicus (Arnold) Diederich
& Pino-Bodas, comb. nov.

BASIONYM: *Biatora carniolica* Arnold, in Głowacki,
Verh. K. K. Zool.-Bot. Ges. Wien 20: 453 (1870);
≡ *Phaeopyxis carniolica* (Arnold) Rambold &
Triebel, Notes Roy. Bot. Gard. Edinburgh 46:
382 (1990)

MYCOBANK MB 827771

Bachmanniomyces muscigenae (Alstrup & E.S.Hansen)
Diederich & Pino-Bodas, comb. nov.

BASIONYM: *Phaeopyxis muscigenae* Alstrup & E.S.Hansen,
Graphis Scripta 12: 44 (2001)

MYCOBANK MB 827772

Bachmanniomyces punctum (A.Massal.) Diederich
& Pino-Bodas, comb. nov.

BASIONYM: *Nesolechia punctum* A.Massal., Schedulae
criticae in lichenis exsiccatis Italiae: 96 (1856);
≡ *Phaeopyxis punctum* (A.Massal.) Rambold,
Triebel & Coppins, Notes Roy. Bot. Gard.
Edinburgh 46: 384 (1990)

SYN. NOV.: *Phyllosticta uncialicola* Zopf, Hedwigia 35:
324 (1896); ≡ *Bachmanniomyces uncialicola*
(Zopf) D.Hawksw., Bull. Brit. Mus. (Nat. Hist.),
Bot. 9: 11 (1981)

MYCOBANK MB 827773

Bachmanniomyces varius (Coppins, Rambold &
Triebel) Diederich & Pino-Bodas, comb. nov.

BASIONYM: *Phaeopyxis varia* Coppins, Rambold &
Triebel, Notes Roy. Bot. Gard. Edinburgh 46:
385 (1990)

MYCOBANK MB 827774

Didymocyrtis grumantiana (Zhurb. & Diederich)
Zhurb. & Diederich, comb. nov.

BASIONYM: *Phoma grumantiana* Zhurb. & Diederich,
in Diederich et al., Lichenologist 39: 160 (2007)
MYCOBANK MB 827775

Although no sequences are available from this species, it strongly resembles other *Phoma* species recently included in *Didymocyrtis* and is most probably closely related to them.

Epithamnolia atrolazulina (Etayo) Diederich,
comb. nov.

BASIONYM: *Hainesia atrolazulina* Etayo, Opera Lilloana
50: 205 (2017)
MYCOBANK MB 827776

Suija et al. (2018) revised the lichenicolous *Hainesia* Ellis & Sacc. species and suggested including them in an enlarged concept of the genus *Epithamnolia* Zhurb. *Hainesia atrolazulina* obviously belongs to the same genus, but is distinguished from all other species by the dark blue, instead of brownish conidiomatal wall (Etayo 2017).

Gyalolechia epiplacanthium (Etayo) Diederich,
comb. nov.

BASIONYM: *Fulgensia epiplacanthium* Etayo, Guineana
16: 170 (2010)
MYCOBANK MB 827777

This species was described for a lichenized taxon with a reduced or sometimes almost absent thallus, growing parasitically over *Placynthium*, otherwise strongly resembling *Fulgensia bracteata*. As the genus *Fulgensia* has recently been shown to be a younger synonym of *Gyalolechia*, and as molecular data placed *F. bracteata* close to the generic types of both *Gyalolechia* and *Fulgensia* (Arup et al. 2013), this new combination becomes necessary.

Divakar et al. (2015) showed that *Phacopsis* s.l. (see Triebel et al. 1995) represents three phylogenetically distinct genera, *Phacopsis* s.str., *Nesolechia* and the new *Raesaenenia*. Divakar et al. (2017) used a temporal phylogenetic method to harmonize family- and genus-level classification and concluded that *Nesolechia* should be considered as a synonym of *Punctelia*, and *Raesaenenia* of *Protousnea*. Molecular data obtained from Peršoh & Rambold (2002) are still insufficient for *Phacopsis* s.str., although Divakar et al. (2015) found, based on a single ITS sequence, that the generic type *P. vulpina* formed a sister relationship with the *Relicina* + *Pseudoparmelia* clade.

As *Nesolechia* was the sister clade of *Punctelia*, and *Raesaenenia* of *Protousnea*, in the phylogenetic tree obtained by Divakar et al. (2017), and as both lichenicolous genera are morphologically and anatomically rather different from the lichenized genera, we continue accepting *Nesolechia* and *Raesaenenia* as distinct genera.

The three taxa combined below were described within *Phacopsis* s.l., but are obviously congeneric with the type of *Nesolechia*, and consequently are combined there.

Nesolechia doerfeltii (Alstrup & P.Scholz) Diederich, comb. nov.

BASIONYM: *Phacopsis doerfeltii* Alstrup & P.Scholz, in Scholz, Sauteria 9: 38 (1998)

MYCOBANK MB 827779

Nesolechia falcispora (Triebel & Rambold) Diederich, comb. nov.

BASIONYM: *Phacopsis falcispora* Triebel & Rambold, in Triebel et al., Bryologist 98: 76 (1995)

MYCOBANK MB 827780

Nesolechia oxyspora* var. *fusca (Triebel & Rambold) Diederich, comb. nov.

BASIONYM: *Phacopsis oxyspora* var. *fusca* Triebel & Rambold, in Triebel et al., Bryologist 98: 80 (1995)

MYCOBANK MB 827781

Phaeoseptoria Speg.

Quaedvlieg et al. (2013) and Phookamsak et al. (2014) showed in multigene phylogenetic analyses that sequences of the type of *Phaeosphaeria* (sexual) and *Phaeoseptoria* (asexual) group together and consequently synonymized *Phaeoseptoria* under *Phaeosphaeria*. However, after the deletion of Art. 57.2 in the new Shenzhen Code (ICN), the earlier name *Phaeoseptoria* (1908) must be used for these species, and not *Phaeosphaeria* (1909).

Although no sequences are available from *Phaeoseptoria peltigerae*, the only known lichenicolous species of the genus, we nevertheless regard it here as a typical member of *Phaeoseptoria*, based on morphological resemblances with the generic type.

Preussia peltigerae (Brackel) Diederich, comb. nov.

BASIONYM: *Sporormiella peltigerae* Brackel, Ber. Bayer. Bot. Ges. 79: 36 (2009)

MYCOBANK MB 827782

Kruys & Wedin (2009) proposed to treat *Sporormiella* Ellis & Everh. as a synonym of *Preussia* Fuckel, based on multigene phylogenetic analyses. Consequently the only known lichenicolous species of *Sporormiella* needs to be combined in *Preussia*.

Sclerococcum Fr. : Fr., Syst. mycol. 1: XL (1821); type: *S. sphaerale* (Ach. : Fr.) Fr.

SYN. NOV.: *Dactylospora* Körb., Syst. Lich. Germ.: 271 (1855); type: *D. floerkei* Körb. [= *D. parasitica* (Flörke) Zopf]

Dactylosporaceae Bellem. & Hafellner, Cryptog. Mycol. 3: 79 (1982); type: *Dactylospora* Körb.

SYN. NOV.: Sclerococcaceae Rėblová, Unter. & W.Gams, Mycol. Progr. 16: 35 (2017); type: *Sclerococcum* Fr. : Fr.

Diederich et al. (2013) presented a first phylogenetic study of *Sclerococcum* in which five species were transferred to *Cladophialophora*. The generic type, *S. sphaerale*, was found to be a member of a strongly supported clade that also included the two non-lichenicolous marine *Dactylospora*, *D. haliotropha* and *D. mangrovei*, and an unidentified rock isolate. Schoch et al. (2009) found that two further sequences of the lichenicolous *D. lobariella* and the saprotrophic *D. imperfecta* belonged to another lineage, concluding that the genus *Dactylospora* was polyphyletic. Rėblová et al. (2017) erroneously concluded that the generic type of *Dactylospora*, the lichenicolous *D. parasitica*, must belong to the clade also containing the lichenicolous *D. lobariella*, and that the family name Dactylosporaceae consequently refers to that lineage. Subsequently, they described the new family Sclerococcaceae for the lineage containing the type of *Sclerococcum* and the two marine *Dactylospora* species. However, Pino-Bodas et al. (2017) have shown that the generic type *D. parasitica* clusters with *S. sphaerale*, both species being included in a lineage with the lichenicolous *D. ahtii*, *D. deminuta*, *D. glaucomarioides*, *D. sp. RP391* and the saprotrophic *D. haliotrepha*, *D. mangrovei* and *D. vrijmoediae*. Our own analyses including newly generated sequences of *D. parasitica* confirm its close relationship with *Sclerococcum sphaerale* (Fig. 4). Moreover, our newly generated sequences of *D. lobariella* cluster with *D. parasitica* suggesting that the published nuLSU sequence of *D. lobariella* by Schoch et al. (2009) is a

contaminant. In our phylogenetic tree (**Fig. 4**), this sequence ('*Dactylospora lobariella* 4') is placed in the outgroup, thus outside of the Sclerococcales because it belongs to the Chaethothyriales. The presumed polyphyly of *Dactylospora* (Schoch et al. 2009) seems thus to be based on contaminant sequences. Two species were reported by Schoch et al. (2009) as belonging to another lineage: *D. lobariella*, for which we can prove, based on newly obtained sequences, that the sequence is a contaminant, and the saprotrophic *D. imperfecta*, for which we had no way to check the quality of the sequence, but we suspect a similar explanation. Moreover, the published mtSSU sequence of *D. diminuta* (KY661681) was not included in our phylogenetic analysis (**Fig. 4**) because it is obviously also a contaminant with a Chaethothyriales species, while the ITS sequence places the species close to other *Dactylospora* s.str. As a result, in Pino-Bodas et al. (2017), the single specimen of *D. diminuta* is placed in the Dactylosporaceae but as the earliest diverging taxon of the family because the mtSSU pulls it out of the core group, giving the impression that it might represent a distinct genus.

In Pino-Bodas et al. (2017) and in our phylogenetic tree (**Fig. 4**), *D. parasitica* is heterogeneous, rendering the correct phylogenetic position of the type of *Dactylospora* within the Dactylosporaceae uncertain. One specimen ('*D. parasitica* 2' in **Fig. 4**) appears to be so close to *Sclerococcum sphaerale* that it might represent its sexual stage.

As a conclusion, *Dactylospora* + *Sclerococcum* appears to represent a monophyletic group, for which the family name Dactylosporaceae has to be used, Sclerococcaceae becoming a new synonym. Further, the two genera *Sclerococcum* and *Dactylospora* cannot be kept as separate. As *Sclerococcum* (1821) predates *Dactylospora* (1855), and after the deletion of Art. 57.2 in the new Shenzhen Code (ICN), the name *Sclerococcum* has to be used for this genus. A proposal to conserve the more species-rich genus *Dactylospora* would not likely be accepted, as *Sclerococcum* currently includes 20 species, as many recent papers dealt with the taxonomy of *Sclerococcum* species, as several recent papers dealt with the molecular phylogeny of *Sclerococcum*, and as the genus is the type of the order Sclerococcales. For the moment, we recognize a single genus in Dactylosporaceae because no morphological characters support the recognition of more than one genus. Indeed, Hafellner (1979)

studied many *Dactylospora* species in his *Karschia* monograph, including lichenicolous and saprotrophic species, and the genus appeared as morphologically homogeneous. Now, almost 40 years later, no attempt of splitting the genus or of excluding some species has been done, and many more species have been described that fit the genus as circumscribed by Hafellner (1979). Molecular phylogenetic results (except one sequence that we prefer to consider as doubtful) also support the hypothesis of the monophyly of the genus.

The following new name and new combinations become therefore necessary for the lichenicolous taxa:

Sclerococcum acarosporicola Ertz & Diederich, nom. nov.

REPLACED SYNONYM: *Karschia acarosporae* H.Magn., Svensk Bot. Tidskr. 37: 285 (1943) non *Sclerococcum acarosporae* S.Y.Kondr., in Kondratyuk & Zelenko, Ukr. Bot. Journ. 59: 600 (2002); ≡ *Dactylospora acarosporae* (H.Magn.) Hafellner, Nova Hedw., Beih. 62: 96 (1979)

MYCOBANK MB 827701

Sclerococcum aeruginosum (Holien & Ihlen) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora aeruginosa* Holien & Ihlen, in Ihlen et al., Bryologist 107: 358 (2004)

MYCOBANK MB 827702

Sclerococcum ahtii (Zhurb. & Pino-Bodas) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora ahtii* Zhurb. & Pino-Bodas, in Pino-Bodas et al., Persoonia 39: 102 (2017)

MYCOBANK MB 827703

Sclerococcum allantoideum (Alstrup & D.Hawksw.) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora allantoidea* Alstrup & D.Hawksw., Meddel. Grønland Biosci. 31: 23 (1990)

MYCOBANK MB 827704

Sclerococcum amygdalariae (Triebel) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora amygdalariae* Triebel, Biblioth. Lichenol. 35: 197 (1989)

MYCOBANK MB 827705

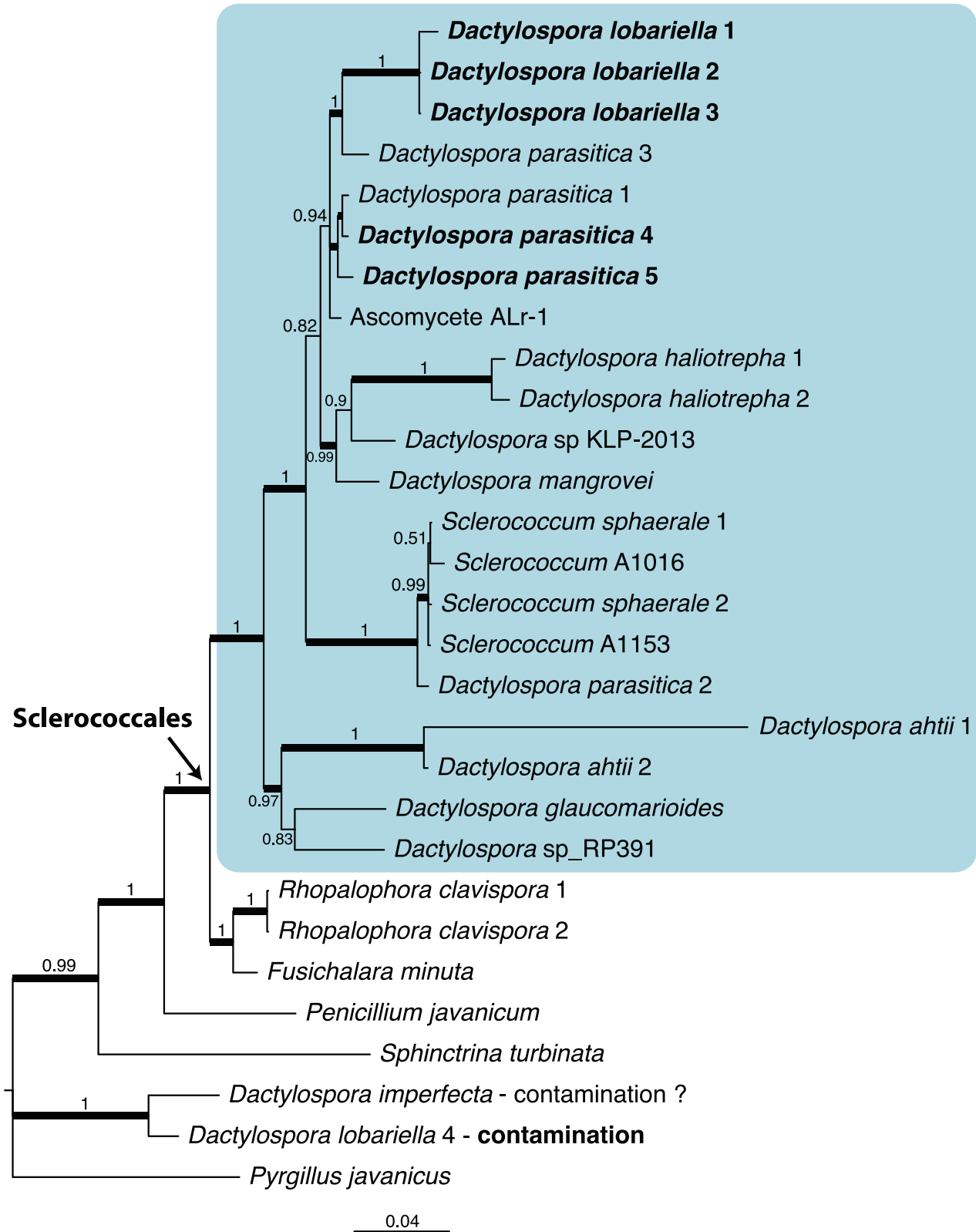


Figure 4. Phylogenetic relationships among 24 samples of Sclerococcales resulting from a Bayesian analysis based on a data set of nuLSU and mtSSU sequences. *Penicillium javanicum*, *Pyrgillus javanicus* and *Sphinctrina turbinata* were chosen as outgroup. Posterior probabilities are shown near internal branches. Internal branches, considered strongly supported (Posterior probabilities ≥ 0.95) are represented by thicker lines. The newly sequenced samples are in bold. The genus *Sclerococcum* (including *Dactylospora*, considered here as a synonym of *Sclerococcum*) is highlighted with a colored box.

Table 6. Species names, voucher specimens and GenBank accession numbers for the specimens included in the phylogenetic inference depicted in Fig. 4. GenBank accession numbers in bold refer to sequences generated by this project.

Name	Voucher	nuLSU	mtSSU	Host for lichenicolous fungi
<i>Pyrgillus javanicus</i>	AFTOL-ID 342	DQ823103	FJ225774	
<i>Penicillium javanicum</i>	AFTOL-ID 429	EF413621	FJ225778	
<i>Sphinctrina turbinata</i>	AFTOL-ID 1721	EF413632	FJ713611	
<i>Fusichalara minuta</i>	CBS 709.88	KX537758	KX537762	
<i>Rhopalophora clavisporea</i> 1	CBS 129.74	KX537755	KX537759	
<i>Rhopalophora clavisporea</i> 2	CBS 281.75	KX537756	KX537760	
<i>Dactylospora ahtii</i> 1	USA, Talbot CHI17-37a (H), RP182	NA	KY661687	<i>Cladonia rangiferina</i>
<i>Dactylospora ahtii</i> 2	Iceland, Hognabba 1325a (H), RP23	KY661659	KY661686	<i>Cladonia uncialis</i> subsp. <i>biuncialis</i>
<i>Dactylospora glaucomarioides</i>	Russia, Zhurbenko 13107 (LE), RP275	KY661660	KY661683	<i>Ochrolechia akagiensis</i>
<i>Dactylospora haliotrepha</i> 1	AFTOL-ID 798	FJ713617	NA	
<i>Dactylospora haliotrepha</i> 2	AFTOL-ID 758	FJ176855	KJ766382	
<i>Dactylospora imperfecta</i>	AFTOL-ID 5006	FJ176896	NA	
<i>Dactylospora lobariella</i> 1	Canary Islands, Ertz 13794 (BR)	MH698497	NA	<i>Lobaria pulmonaria</i>
<i>Dactylospora lobariella</i> 2	Austria, Diederich 17708 (hb Diederich)	MH698498	MH698502	<i>Lobaria pulmonaria</i>
<i>Dactylospora lobariella</i> 3	France, Diederich 18109 (hb Diederich)	MH698499	MH698503	<i>Lobaria pulmonaria</i>
<i>Dactylospora lobariella</i> 4	AFTOL-ID 2137	FJ176891	NA	?
<i>Dactylospora mangrovei</i>	AFTOL-ID 2108; CBS 110444	FJ176890	KJ766383	
<i>Dactylospora parasitica</i> 1	Russia, Tugi (LE), RP422	KY661666	KY661690	<i>Ochrolechia</i> sp.
<i>Dactylospora parasitica</i> 2	Russia, Zhurbenko 12135 (LE), RP423	NA	KY661691	<i>Ochrolechia</i> sp.
<i>Dactylospora parasitica</i> 3	Finland, Pykala 39145 (H), RP424	KY661667	KY661692	<i>Ochrolechia</i> sp.
<i>Dactylospora parasitica</i> 4	Belgium, Ertz 16080 (BR)	MH698500	MH698504	<i>Ochrolechia turneri</i>
<i>Dactylospora parasitica</i> 5	Canary Islands, van den Boom 46349 (hb v.d.Boom)	MH698501	MH698505	on sorediate crust cf. <i>Pertusaria flavicans</i>
<i>Dactylospora</i> sp RP391	Chile, Buck 60495a (H)	KY661664	KY661689	<i>Cladonia rangiferina</i>
<i>Dactylospora</i> sp KLP-2013	isolate NTOU4002	KC692153	NA	
Ascomycete ALr-1	isolate ALr-1	EF210108	NA	<i>Lecanora rupicola</i>
<i>Sclerococcum sphaerale</i> 1	Luxembourg, Diederich 17279 (hb Diederich)	JX081672	JX081677	<i>Pertusaria corallina</i>
<i>Sclerococcum sphaerale</i> 2	Belgium, Ertz 17425 (BR)	JX081674	JX081676	<i>Pertusaria corallina</i>
<i>Sclerococcum</i> A1016	Austria, Muggia & Fleischhacker (GZU)	KT263077	KT263115	lichen thalli
<i>Sclerococcum</i> A1153	Austria, Muggia	MF071425	MF085485	<i>Pertusaria corallina</i>

Sclerococcum anziae (Zhurb., Ezhkin, Skirina & Y.Ohmura) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora anziae* Zhurb., Ezhkin, Skirina & Y.Ohmura, Folia Cryptog. Estonica 54: 13 (2017)

MYCOBANK MB 827706

Sclerococcum aspiciliicola (Alstrup & D.Hawksw.) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora aspiciliicola* Alstrup & D.Hawksw., Meddel. Grønland Biosci. 31: 24 (1990)

MYCOBANK MB 827707

Sclerococcum athallinum (Müll.Arg.) Ertz & Diederich, comb. nov.

BASIONYM: *Buellia athallina* Müll.Arg., Mem. Soc. Phys. Genève 16: 64 (1862); ≡ *Dactylospora*

athallina (Müll.Arg.) Hafellner, Beih. Nova Hedwigia 62: 99 (1979)

MYCOBANK MB 827708

Sclerococcum attendendum (Nyl.) Ertz & Diederich, comb. nov.

BASIONYM: *Lecidea attendenda* Nyl., Flora 49: 419 (1866); ≡ *Dactylospora attendenda* (Nyl.) Arnold, Flora 57: 108 (1874)

MYCOBANK MB 827709

Sclerococcum australe (Triebel & Hertel) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora australis* Triebel & Hertel, in Triebel, Biblioth. Lichenol. 35: 205 (1989)

MYCOBANK MB 827710

Sclerococcum boreale (Holien & Ihlen) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora borealis* Holien & Ihlen, in Ihlen et al., Bryologist 107: 359 (2004)

MYCOBANK MB 827711

Sclerococcum cladoniicola (Alstrup & Olech) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora cladoniicola* Alstrup & Olech, Polish Polar Res. 14: 35 (1993)

MYCOBANK MB 827712

Sclerococcum crassum (Sarrión & Hafellner) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora crassa* Sarrión & Hafellner, Lichenologist 34: 361 (2002)

MYCOBANK MB 827713

Sclerococcum davidii (Hafellner & H.Mayrhofer) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora davidii* Hafellner & H.Mayrhofer, Biblioth. Lichenol. 95: 233 (2007)

MYCOBANK MB 827714

Sclerococcum deminutum (Th.Fr.) Ertz & Diederich, comb. nov.

BASIONYM: *Lecidea parasitica* var. *deminuta* Th.Fr., Öfvers. Kongl. Vetensk.-Akad. Förh. 13: 127 (1856); ≡ *Dactylospora deminuta* (Th.Fr.) Triebel, Biblioth. Lichenol. 35: 209 (1989)

MYCOBANK MB 827715

Sclerococcum dobrowskii (Olech & Alstrup) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora dobrowskii* Olech & Alstrup, Polish Polar Res. 17: 166 (1996)

MYCOBANK MB 827716

Sclerococcum frigidum (Hafellner) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora frigida* Hafellner, Herzogia 7: 166 (1985)

MYCOBANK MB 827717

Sclerococcum glaucomarioides (Tuck.) Ertz & Diederich, comb. nov.

BASIONYM: *Buellia glaucomarioides* Tuck., Synops. North Americ. Lich. 2: 108 (1888); ≡ *Dactylo-*

spora glaucomarioides (Tuck.) Hafellner, Beih. Nova Hedwigia 62: 109 (1979)

MYCOBANK MB 827718

Sclerococcum hafellnerianum (Sérus.) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora hafellneriana* Sérus., in Sérusiaux & Wessels, Mycotaxon 19: 499 (1984)

MYCOBANK MB 827719

Sclerococcum heterodermiae (Etayo) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora heterodermiae* Etayo, Opera Lilloana 50: 165 (2017)

MYCOBANK MB 827720

Sclerococcum homoclinellum (Nyl.) Ertz & Diederich, comb. nov.

BASIONYM: *Lecidea homoclinella* Nyl., Flora 55: 361 (1872); ≡ *Dactylospora homoclinella* (Nyl.) Hafellner, Beih. Nova Hedwigia 62: 112 (1979)

MYCOBANK MB 827721

Sclerococcum inconspicuum (Etayo) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora inconspicua* Etayo, Biblioth. Lichenol. 98: 79 (2008)

MYCOBANK MB 827722

Sclerococcum inquilinum (Tuck.) Ertz & Diederich, comb. nov.

BASIONYM: *Buellia inquilina* Tuck., Lich. Calif. 32 (1866); ≡ *Dactylospora inquilina* (Tuck.) Hafellner, Beih. Nova Hedwigia 62: 116 (1979)

MYCOBANK MB 827723

Sclerococcum lobariellum (Nyl.) Ertz & Diederich, comb. nov.

BASIONYM: *Lecidea lobariella* Nyl., Flora 52: 296 (1869); ≡ *Dactylospora lobariella* (Nyl.) Hafellner, Beih. Nova Hedwigia 62: 118 (1979)

MYCOBANK MB 827724

Sclerococcum microsporum (Etayo) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora microspora* Etayo, Candollea 46: 391 (1991)

MYCOBANK MB 827725

Sclerococcum orygmæum (Nyl.) Ertz & Diederich, comb. nov.

BASIONYM: *Lecidea orygmæa* Nyl., Flora 52: 296 (1869); ≡ *Dactylospora orygmæa* (Nyl.) S.Y.Kondrat. & D.J.Galloway, Biblioth. Lichenol. 57: 336 (1995)

MYCOBANK MB 827726

Sclerococcum parasitaster (Nyl.) Ertz & Diederich, comb. nov.

BASIONYM: *Lecidea parasitaster* Nyl., Flora 58: 105 (1875); ≡ *Dactylospora parasitaster* (Nyl.) Arnold, Flora 58: 346 (1875)

MYCOBANK MB 827727

Sclerococcum parasiticum (Flörke) Ertz & Diederich, comb. nov.

BASIONYM: *Lecidea parasitica* Flörke, Deutsche Lichenen 6: 3 (1819); ≡ *Dactylospora parasitica* (Flörke) Zopf, Hedwigia 35: 159 (1896)

MYCOBANK MB 827728

= *Dactylospora floerkei* Körb., Systema lichenum Germaniae: 271 (1855), nom. illeg. superfl.

SYN. NOV.: *Sclerophyton occidentale* Herre [as *occidentale*], Bryologist 43: 27 (1940). TYPE: U.S.A. CALIFORNIA: Santa Clara Co., Los Gatos, on *Quercus californica*, on *Ochrolechia turneri* (identification kindly confirmed by M. Kukwa based on photographs), 30.ix.1907, A. Herre 1183 (F – lichenicolous apothecia, lectotype here designated; M! – isolectotype).

Notes: The holotype is now kept in F (kindly examined by T. Lumbsch and compared with our photos from the M specimen) and entirely agrees with an isotype kept in M examined by us. The type material represents a thallus of *Ochrolechia turneri* parasitized by apothecia of *Sclerococcum parasiticum*. As Herre's name is based on a mixture of a lichen and a lichenicolous fungus, we herewith lectotypify it on the lichenicolous apothecia present in the type specimen kept in F.

Sclerococcum parellarium (Nyl.) Ertz & Diederich, comb. nov.

BASIONYM: *Lecidea parellaria* Nyl., Flora 59: 239 (1876); ≡ *Dactylospora parellaria* (Nyl.) Arnold, Flora 60: 300 (1877)

MYCOBANK MB 827729

Sclerococcum pertusariicola (Tuck.) Ertz & Diederich, comb. nov.

BASIONYM: *Buellia pertusariicola* Tuck. [as *pertusariicola*], Synops. North Americ. Lich. 2: 108 (1888); ≡ *Dactylospora pertusariicola* (Tuck.) Hafellner, Beih. Nova Hedwigia 62: 122 (1979)

MYCOBANK MB 827730

Sclerococcum pleiospermum (Triebel) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora pleiosperma* Triebel, in Hafellner, Mycotaxon 84: 300 (2002)

MYCOBANK MB 827731

Sclerococcum polysporum (Triebel) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora polyspora* Triebel, Biblioth. Lichenol. 35: 212 (1989)

MYCOBANK MB 827732

Sclerococcum porphyreum (Hafellner & Kalb) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora porphyrea* Hafellner & Kalb, in Hafellner, Herzogia 7: 169 (1985)

MYCOBANK MB 827733

Sclerococcum protothallinum (Anzi) Ertz & Diederich, comb. nov.

BASIONYM: *Abrothallus prothallinus* Anzi, Catal. Lich. Sond.: 116 (1860); ≡ *Dactylospora protothallina* (Anzi) Hafellner, Beih. Nova Hedwigia 62: 124 (1979)

MYCOBANK MB 827734

Sclerococcum purpurascens (Triebel) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora purpurascens* Triebel, Biblioth. Lichenol. 35: 214 (1989)

MYCOBANK MB 827735

Sclerococcum pyrenaicum (Etayo) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora pyrenaica* Etayo, Guineana 16: 147 (2010)

MYCOBANK MB 827736

Sclerococcum rhyparizae (Arnold) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora rhyparizae* Arnold, Flora 57: 108 (1874)

MYCOBANK MB 827737

Sclerococcum rimulicola (Müll.Arg.) Ertz & Diederich, comb. nov.

BASIONYM: *Buellia rimulicola* Müll.Arg., Flora 55: 500 (1872); \equiv *Dactylospora rimulicola* (Müll.Arg.) Hafellner, Beih. Nova Hedwigia 62: 126 (1929)

MYCOBANK MB 827738

Sclerococcum rostrupii (Alstrup) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora rostrupii* Alstrup, in Alstrup et al., Frodskaparrit 40: 89 (1994)

MYCOBANK MB 827739

Sclerococcum saxatile (Schaer.) Ertz & Diederich, comb. nov.

BASIONYM: *Calicium saxatile* Schaer., Naturwiss. Anz. Allg. Schweiz. Ges. Gesamten Naturwiss. 5: 35 (1821); \equiv *Dactylospora saxatilis* (Schaer.) Hafellner, Beih. Nova Hedwigia 62: 129 (1979)

MYCOBANK MB 827740

Sclerococcum saxatile var. *laureri* (Hafellner) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora saxatilis* var. *laureri* Hafellner, Beih. Nova Hedwigia 62: 135 (1979)

MYCOBANK MB 827741

Sclerococcum suburceolatum (Coppins & Fryday) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora suburceolata* Coppins & Fryday, Lichenologist 44: 725 (2012)

MYCOBANK MB 827742

Sclerococcum tegularum (Arnold) Ertz & Diederich, comb. nov.

BASIONYM: *Buellia tegularum* Arnold, Ber. Bayer. Bot. Ges. 1 (suppl.): 130 (1891); \equiv *Dactylospora tegularum* (Arnold) Hafellner, Beih. Nova Hedwigia 62: 149 (1979)

MYCOBANK MB 827743

Sclerococcum urceolatum (Th.Fr.) Ertz & Diederich, comb. nov.

BASIONYM: *Buellia urceolata* Th.Fr., Lich. Arctoi 3: 333 (1860)

MYCOBANK MB 827744

The following new species has been contributed by Dr B. Coppins:

Sclerococcum ophthalmizae Coppins, sp. nov.

MYCOBANK MB 827745

Differs from S. parasitica in having 16-spored asci, ascospores to 7-septate, and a different internal pigmentation.

TYPE: BRITISH ISLES. SCOTLAND: WESTERNNESS (VC 97): N side of Loch Sunart, c. 10 km WSW of Salen, Rubha Aird Druimnich, NM597610, 0–30 m elev., on thallus of *Leptra ophthalmiza* on *Betula* trunk, 8.iii.1983, B.J. Coppins 9274 & P.M. Jørgensen (E – holotype; GZU – isotype).

Ascomata 0.12–0.4 mm diam., scattered, black; disc concave to flat; margin smooth. Exciple 25–30 μ m wide, reddish brown (K–) or green tinged in upper part; cells to 10 μ m diam. Hymenium 50–60 μ m tall, colourless; epihymenium brown, K–. Hypothecium pale grey- or reddish-brown, K–. Paraphyses 1.5–1.7 μ m thick; apices to 3 μ m. *Asci* c. 50 \times 12–17 μ m, 16-spored. Ascospores (10.5–)12–18 \times 3.5–4.5 μ m, narrowly ellipsoid, oblong or fusiform, sometimes curved, brown, smooth-walled or slightly roughened when old, 3(–7)-septate.

Distribution and host: Known from Scotland (Isle of Skye, Westernness: Loch Sunart, West Ross), always on the thallus of *Leptra ophthalmiza*.

Additional specimens examined: BRITISH ISLES. SCOTLAND. WESTERNNESS (VC 97): N side of Loch Sunart, Glenborrodale, RSPB Nature Reserve, NM6060, on *Quercus*, 15.vi.1992, B.J. Coppins 15293 (E). KINTYRE (VC 101): Knapdale, Loch Coill-Bharr, NR780897, birch-oak wood, on *Quercus*, 22.x.2001, B.J. & A.M. Coppins 20460 (E). WEST ROSS (VC 105): Inverpolly NNR, N side of Allt Geann an t-Strathain, NC090163, 30–50 m elev., SE-facing hazel pasture woodland, on large boulder, 8.vi.1999, B.J. & A.M. Coppins 18765 (E, sub *Leptra ophthalmiza*); Beinn Eighe NNR, Coille na Glas-leitir, NE of Cnoc na Gaoithe, NG9964, c. 150 m elev., 14.iv.2001, B.J. & A.M. Coppins 19731 (E); Loch Maree, Eilean Dubh na Sròine. NG910720. 15 m elev., on *Pinus*, 31.v.1999, B.J. Coppins 18555 & V.J. Giavarini (E, sub *Leptra ophthalmiza*).

Although this species has never been formally described, the name *Dactylospora ophthalmizae* Coppins has been used for many years by British lichenologists, as it is included in the keys to British, Iberian and Canarian lichenicolous fungi (Hawksworth et al. 2010a).

We further combine in *Sclerococcum* three non-lichenicolous *Dactylospora* species that have been included in recent phylogenetic analyses (Diederich et al. 2013; Pino-Bodas et al. 2017; R  blov  et al. 2017) and that belonged to the same clade as the type:

Sclerococcum haliotrephum (Kohlm. & E.Hohlm.) Ertz & Diederich, comb. nov.

BASIONYM: *Buellia haliotrepha* Kohlm. & E.Kohlm., Nova Hedwigia 9: 90 (1965); ≡ *Dactylospora haliotrepha* (Kohlm. & E.Kohlm.) Hafellner, Beih. Nova Hedwigia 62: 111 (1979)
MYCOBANK MB 827746

Sclerococcum mangrovei (E.B.G.Jones, Alias, Abdel-Wahab & S.Y.Hsieh) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora mangrovei* E.B.G.Jones, Alias, Abdel-Wahab & S.-Y.Hsieh, in Jones et al., Mycoscience 40: 317 (1999)
MYCOBANK MB 827747

Sclerococcum vrijmoediae (K.L.Pang, S.Y.Guo, Alias, Hafellner & E.B.G.Jones) Ertz & Diederich, comb. nov.

BASIONYM: *Dactylospora vrijmoediae* K.L.Pang, S.Y.Guo, Alias, Hafellner & E.B.G.Jones, Botanica Marina 57: 317 (2014)
MYCOBANK MB 827748

The genus *Libertiella* Speg. & Roum. with the type *L. malmedyensis* Speg. & Roum. resembles mesoconidial stages of *Scutula* so much that there is no doubt that both genera are synonyms (Triebl et al. 1997). As all currently accepted species of *Scutula* are confined to hosts belonging to Peltigerales, we combine here in *Scutula* two species of *Libertiella* described from *Peltigera*. We refrain from combining a further species, *L. fennica* Alstrup, also growing on *Peltigera*, as it differs by the ovoid or pyriform to subglobose conidia, distinct from conidia of all other known *Scutula* species, as well as *L. leprariae* Etayo & Diederich (on *Lepraria*) and the poorly known *L.*

obscurior Gerber (on *Brodoa*) known from hosts not belonging to the Peltigerales.

Scutula curvispora (D.Hawksw. & Mi dl.) Diederich, comb. nov.

BASIONYM: *Libertiella curvispora* D.Hawksw. & Mi dl., Mycol. Res. 101: 1127 (1997)
MYCOBANK MB 827783

Scutula didymospora (D.Hawksw. & Mi dl.) Diederich, comb. nov.

BASIONYM: *Libertiella didymospora* D.Hawksw. & Mi dl., Mycol. Res. 101: 1128 (1997)
MYCOBANK MB 827784

Stigmidium haesitans (Nyl.) Diederich, comb. nov.

BASIONYM: *Verrucaria haesitans* Nyl., in Kihlman, Meddeland. Soc. Fauna Fl. Fenn. 18: 59 (1891); ≡ *Pharcidia haesitans* (Nyl.) Vouaux, Bull. Soc. Mycol. France 28: 249 (1912)
MYCOBANK MB 827785

Mayrhofer (1987: 336) reported *Pharcidia haesitans* from Sweden and wrote that it belonged to *Stigmidium*, fide Hafellner (pers. comm.). Later, the species was incorrectly referred to as *S. haesitans* (Nyl.) Hafellner (Santesson 1993a), although such a combination was never published. This error was later addressed by Santesson et al. (2004) who used the same name and authorities, by adding “comb. not published”. The name is hereby validly combined in *Stigmidium*.

Stigmidium parvum (Henssen) Diederich, comb. nov.

BASIONYM: *Pharcidia parva* Henssen, Symb. Bot. Upsal. 18: 112 (1963)
MYCOBANK MB 827786

Santesson (1993a) named this taxon “*Stigmidium parvum* (Henssen) (Provisionally placed here, Art. 34.1b)”, followed by the basionym, but without a full reference to that basionym. As this author clearly did not intend to publish a new combination, and according to Art. 41.1 of ICN, the new combination was not validly published. We herewith validly combine the species in *Stigmidium*.

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LITERATURE CITED

- Acharius, E. 1795. Nya och mindre kaenda Svenska Lafarter, beskrifne (V:te Fortsaettning). Kongl. Vetenskaps Academiens, Nya Handlingar 1795: 207–215.
- Acharius, E. 1810. Lichenographia Universalis. Danckwerts, Göttingen.
- Akaike, H. 1973. Information theory and an extension of the maximum likelihood principle. In Petrov B.N. & F. Csaki: Proceedings of the 2nd International Symposium on Information Theory. Budapest, Akademiai Kiado: 267–281.
- Alstrup, V. 1991. *Sporidesmium bacidiicola* sp. n. Graphis Scripta 3: 44–45.
- Alstrup, V. 1992. *Weddellomyces aspiciliicola*, a new lichenicolous fungus found in Czechoslovakia. Folia Geobotanica et Phytotaxonomica 27: 185–187.
- Alstrup, V. 1993a. News on lichens and lichenicolous fungi from the Nordic countries. Graphis Scripta 5: 96–104.
- Alstrup, V. 1993b. Notes on some lichenicolous fungi from Denmark. Graphis Scripta 5: 60–64.
- Alstrup, V. 1996. *Nectria tatrensis* sp. nov. and other lichenicolous fungi found on the bryo-lichenological excursion in Slovakia 1993. Biológia [Bratislava] 51: 13–14.
- Alstrup, V. 1997. New lichenicolous fungi found on the NLF meeting in Norway. Graphis Scripta 8: 25–29.
- Alstrup, V. 2002. Revisions of some lichens and lichenicolous fungi from Antarctica. Folia Cryptogamica Estonica 39: 1–2.
- Alstrup, V. & M. S. Cole. 1998. Lichenicolous fungi of British Columbia. The Bryologist 101: 221–229.
- Alstrup, V. & E. S. Hansen. 2001. New lichens and lichenicolous fungi from Greenland. Graphis Scripta 12: 41–50.
- Alstrup, V. & D. L. Hawksworth. 1990. The lichenicolous fungi of Greenland. Meddelelser om Gronland, Bioscience 31: 1–90.
- Alstrup, V. & M. Olech. 1993. Lichenicolous fungi from Spitsbergen. Polish Polar Research 14: 33–42.
- Alstrup, V. & M. Olech. 1996. Lichenicolous fungi from the Polish Tatra Mountains. Fragmenta Floristica et Geobotanica 41: 747–752.
- Alstrup, V. & S. Svane. 1998. Interesting lichens and lichenicolous fungi from northeast Jutland, Denmark. Graphis Scripta 9: 23–25.
- Alstrup, V., S. N. Christensen, E. S. Hansen & S. Svane. 1994. The lichens of the Faroes. Fróðskaparrít 40: 61–121.
- Alves, M. M. E., A. Aptroot, S. R. Lacerda & M. E. D. S. Cáceres. 2014. Three new Arthoniaceae from Chapada do Araripe, Ceará, NE Brazil. Lichenologist 46: 663–667.
- Andreev, M. 2010. *Halecania santessonii*, a new lichenicolous lichen from Russia. Lichenologist 42: 249–252.
- Aptroot, A. 1991. A monograph of the Pyrenulaceae (excluding *Anthracothecium* and *Pyrenula*) and the Reuquenellaceae, with notes on the Pleomassariaceae, the Trypetheliaceae and *Mycromicrothelia* (lichenized and non-lichenized Ascomycetes). Bibliotheca Lichenologica 44: 1–178.
- Aptroot, A. 2014. Two new genera of Arthoniales from New Caledonia and the Solomon Islands, with the description of eight further species. The Bryologist 117: 282–289.
- Aptroot, A. & K. H. Moon. 2015. New lichen records from Korea, with the description of the lichenicolous *Halecania parasitica*. Herzogia 28: 193–203.
- Aptroot, A. & H. J. M. Sipman. 2001. New Hong Kong lichens, ascomycetes and lichenicolous fungi. Journal of the Hattori Botanical Laboratory 91: 317–343.
- Aptroot, A. & D. Triebel. 2002. A new *Phacopsis* species on *Paraparmelia* and *Xanthoparmelia* in southern Africa. Nova Hedwigia 74: 405–409.
- Aptroot, A., P. Diederich, E. Sérusiaux & H. J. M. Sipman. 1995. Lichens and lichenicolous fungi of Laing Island (Papua New Guinea). Bibliotheca Lichenologica 57: 19–48.
- Aptroot, A., P. Diederich, E. Sérusiaux & H. J. M. Sipman. 1997. Lichens and Lichenicolous Fungi from New Guinea. Bibliotheca Lichenologica 64: 1–220.
- Ariyawansa, H. A., K. D. Hyde, S. C. Jayasiri, B. Buyck, K. W. T. Chethana, D. Q. Dai, Y. C. Dai, D. A. Daranagama, R. S. Jayawardena, R. Lücking, M. Ghobad-Nejhad, T. Niskanen, K. M. Thambugala, K. Voigt, R. L. Zhao, G.-J. Li, M. Doilom, S. Boonmee, Z. L. Yang, Q. Cai, Y.-Y. Cui, A. H. Bahkali, J. Chen, B. K. Cui, J. J. Chen, M. C. Dayarathne, A. J. Dissanayake, A. H. Ekanayaka, A. Hashimoto, S. Hongsanan, E. B. Gareth Jones, E. Larsson, W. J. Li, Q.-R. Li, J. K. Liu, Z. L. Luo, S. S. N. Maharachchikumbura, A. Mapook, E. H. C. McKenzie, C. Norphanphoun, S. Konta, K. L. Pang, R. H. Perera, R. Phookamsak, C. Phukhamsakda, U. Pinruan, E. Randrianjohany, C. Singtripop, K. Tanaka, C. M. Tian, S. Tibpromma, M. A. Abdel-Wahab, D. N. Wanasinghe, N. N. Wijayawardene, J.-F. Zhang, H. Zhang, F. A. Abdel-Aziz, M. Wedin, M. Westberg, J. F. Ammirati, T. S. Bulgakov, D. X. Lima, T. M. Callaghan, P. Callac, C.-H. Chang, L. F. Coca, M. Dal-Forno, V. Dollhofer, K. Fliiegerová, K. Greiner, G. W. Griffith, H.-M. Ho, V. Hofstetter, R. Jeewon, J. C. Kang, T.-C. Wen, P. M. Kirk, I. Kytövuori, J. D. Lawrey, J. Xing, H. Li, Z. Y. Liu, X. Z. Liu, K. Liimatainen, H. T. Lumbsch, M. Matsumura, B. Moncada, S. Nuankae, S. Parmmen, A. L. C. M. de Azevedo Santiago, S. Sommai, Y. Song, C. A. F. de Souza, C. M. de Souza-Motta, H. Y. Su, S. Suetrong, Y. Wang, S.-F. Wei, T. C. Wen, H. S. Yuan, L. W. Zhou, M. Réblová, J. Fournier, E. Camporesi, J. J. Luangsa-ard, K. Tasanathai, A. Khonsanit, D. Thanakitpipattana, S. Somrithipol, P. Diederich, A. M. Millanes, R. S. Common, M. Stadler, J. Y. Yan, X. H. Li, H. W. Lee, T. T. T. Nguyen, H. B. Lee, E. Battistin, O. Marsico, A. Vizzini, J. Vila, E. Ercole, U. Eberhardt, G. Simonini, H.-A. Wen, X.-H. Chen, O. Miettinen, V. Spirin & Hernawati (2015). Fungal diversity notes 111–252—taxonomic and phylogenetic contributions to fungal taxa. Fungal Diversity 75: 27–274.
- Aptroot, A., N. Mota Junior, V. Santos & M. E. S. Cáceres. 2016. New tropical calicioid lichens from South America. Lichenologist 48: 135–139.
- Arnold A. E., J. Miadlikowska, K. L. Higgins, S. D. Sarvate, P. Gugger, A. Way, V. Hofstetter, F. Kauff & F. Lutzoni. 2009. A phylogenetic estimation of trophic transition networks for ascomycetous fungi: Are lichens cradles of symbiotrophic diversification? Systematic Biology 58: 283–297.

- Arup, U., U. Søchting & P. Frödén. 2013. A new taxonomy of the family Teloschistaceae. *Nordic Journal of Botany* 31: 16–3.
- Arvidsson, L. 1976. *Athelia arachnoidea* (Berk.) Jül. and its influence on epiphytic cryptogams in urban areas. Göteborgs Svampklubbs Årsskrift 1975–1976: 4–10.
- Arvidsson, L. 1978. Svampangrepp på lavar—en orsak till lavöken. *Svensk Botanisk Tidskrift* 72: 285–292.
- Asplund, J., Y. Gauslaa & S. Merinero. 2016. The role of fungal parasites in tri-trophic interactions involving lichens and lichen-feeding snails. *New Phytologist* 211: 1352–1357.
- Asplund, J., Y. Gauslaa & S. Merinero. 2018. Low synthesis of secondary compounds in the lichen *Lobaria pulmonaria* infected by the lichenicolous fungus *Plectocarpus lichenum*. *New Phytologist* 217: 1397–1400.
- Atienza, V. 2002. Two new species of *Minutoexcipula* (mitosporic fungi) from Spain. *Bibliotheca Lichenologica* 82: 141–152.
- Atienza, V. & D. L. Hawksworth. 1994. *Minutoexcipula tuckerae* gen. et sp. nov., a new lichenicolous deuteromycete on *Pertusaria texana* in the United States. *Mycological Research* 98: 587–592.
- Atienza, V. & D. L. Hawksworth. 2008. *Lichenothelia renobalesiana* sp. nov. (Lichenotheliaceae), for a lichenicolous ascomycete confused with *Polycoccum opulentum* (Dacampiaceae). *Lichenologist* 40: 87–96.
- Atienza, V., V. Calatayud & D. L. Hawksworth. 2003. Notes on the genus *Polycoccum* (Ascomycota, Dacampiaceae) in Spain, with a key to the species. *Lichenologist* 35: 125–135.
- Atienza, V., S. Pérez-Ortega & J. Etayo. 2009. Two new conidial lichenicolous fungi from Spain indicate the distinction of *Lichenodiplis* and *Minutoexcipula*. *Lichenologist* 41: 223–229.
- Awasti, D. D. 1991. A key to the microlichens of India, Nepal and Sri Lanka. *Bibliotheca Lichenologica* 40: 1–337.
- Baloch, E., G. Gilenstam & M. Wedin. 2013. The relationships of *Odontotrema* (Odontotremataceae) and the resurrected *Sphaeropezia* (Stictidaceae)—new combinations and three new *Sphaeropezia* species. *Mycologia* 105: 384–397.
- Barr, M. E. 1997. Notes on some ‘Dimeriaceous’ fungi. *Mycotaxon* 64: 149–171.
- Barrasa, J. M. & V. J. Rico. 2010. Taxonomic and nomenclatural comments on the lichenicolous agaric *Arrhenia peltigerina*. *Lichenologist* 42: 485–490.
- Bensch, K., U. Braun, J. Z. Groenewald & P. W. Crous. 2012. The genus *Cladosporium*. *Studies in Mycology* 72: 1–401.
- Berger, F. 2000. Beitrag zur Kenntnis der Flechten und lichenicolen Pilze Islands. *Acta Botanica Islandica* 13: 69–82.
- Berger, F. & P. Diederich. 1996. *Lichenodiplis hawksworthii* sp. nov., a third lichenicolous species of *Lichenodiplis* (Coelomycetes). *Herzogia* 12: 35–38.
- Berger, F. & S. LaGrecia. 2014. Contributions to the lichen flora of Bermuda – Part I. New records, new combinations, and interesting collections of lichenized ascomycetes. *Evansia* 31: 41–68.
- Berger, F. & E. Zimmermann. 2016. Addition to the lichen flora of Madeira with special focus on lichenicolous fungi. *Herzogia* 29: 235–276.
- Berger, F., U. Braun & B. Heuchert. 2015. *Gonatophragmium lichenophilum* sp. nov. – a new lichenicolous hyphomycete from Austria. *Mycobiota* 5: 7–13.
- Boqueras, M. & P. Diederich. 1993. New or interesting lichenicolous fungi. 3. *Karsteniomyces llimonae* sp. nov. and *Sclerococcum serusiaxii* sp. nov. (Deuteromycotina). *Mycotaxon* 47: 425–431.
- Brackel, W. von. 2008. *Phoma ficuzzae* sp. nov. and some other lichenicolous fungi from Sicily, Italy. *Sauteria* 15: 103–120.
- Brackel, W. von. 2009. Weitere Funde von flechtenbewohnenden Pilzen in Bayern – Beitrag zu einer Checkliste IV. *Berichte der Bayerischen Botanischen Gesellschaft* 79: 5–55.
- Brackel, W. von. 2010a. Weitere Funde von flechtenbewohnenden Pilzen in Bayern – Beitrag zu einer Checkliste V. *Berichte der Bayerischen Botanischen Gesellschaft* 80: 5–32.
- Brackel, W. von. 2010b. *Dacampia cyrtellae*, a new name for *Dacampia lecaniae* Brackel. *Herzogia* 23: 315–316.
- Brackel, W. von. 2010c. Some lichenicolous fungi and lichens from Iceland, including *Lichenopeltella uncialicola* sp. nov. *Herzogia* 23: 93–109.
- Brackel, W. von. 2011a. Lichenicolous fungi and lichens from Puglia and Basilicata (southern Italy). *Herzogia* 24: 65–101.
- Brackel, W. von. 2011b. *Lichenopeltella rangiferinae* sp. nov. and some other lichenicolous fungi from Iceland. *Acta Botanica Islandica* 15: 51–60.
- Brackel, W. von. 2013a. Einige Nachweise von flechtenbewohnenden Pilzen aus den italienischen Alpen. *Herzogia* 26: 141–157.
- Brackel, W. von. 2013b. *Pronectria rhizocarpicola*, a new lichenicolous fungus from Switzerland. *Mycosphere* 4: 926–928.
- Brackel, W. von. 2014. Kommentierter Katalog der flechtenbewohnenden Pilze Bayerns. *Bibliotheca Lichenologica* 109: 476 pp.
- Brackel, W. von. 2015. Lichenicolous fungi from Central Italy with notes on some remarkable hepaticolous, algicolous and lichenized fungi. *Herzogia* 28: 212–281.
- Brackel, W. von. 2016. Eine neue flechtenbewohnende *Micarea*-Art aus Baden-Württemberg. *Carolinea* 74: 5–9.
- Brackel, W. von & F. Berger. 2010. Gall-inducing species of *Polycoccum* (Ascomycota) on the lichen genus *Placopsis*. *Herzogia* 23: 195–204.
- Brackel, W. von & J. Etayo. 2010. *Pronectria collematis* (Bionectriaceae, Hypocreales), a new species on *Collema* from Germany and Spain. *Lichenologist* 42: 361–364.
- Brackel, W. von & J. Kocourková. 2006. *Endococcus karlstadtensis* sp. nov. und weitere Funde von flechtenbewohnenden Pilzen in Bayern – Beitrag zu einer Checkliste II. *Berichte der Bayerischen Botanischen Gesellschaft* 76: 5–32.
- Brackel, W. von & S. Markovskaja. 2009. A new lichenicolous species of *Endophragmiella* from Bavaria/Germany. *Nova Hedwigia* 88: 513–519.
- Brackel, W. & D. Puntillo. 2016. New records of lichenicolous fungi from Calabria (southern Italy), including a first checklist. *Herzogia* 29: 277–306.
- Brackel, W. von & D. G. Zimmermann. 2012. Eine neue *Nectriopsis*-Art auf *Cladonia* aus Nordrhein-Westfalen. *Herzogia* 25: 231–234.
- Brackel, W. von J. Etayo & C. Lechat. 2012. Notes on three lichenicolous species of *Acremonium* including two new species. *Mycosphere* 3: 854–862.
- Braun, U. 1988. Studies on *Ramularia* and allied genera (I). *International Journal of Mycology and Lichenology* 3: 271–285.
- Braun, U. & B. Heuchert. 2010. *Sporidesmiella lichenophila* sp. nov. – a new lichenicolous hyphomycete. *Herzogia* 23: 69–74.
- Braun, U., B. Heuchert & W. von Brackel. 2008. *Pseudosporopetes longipilus* on *Lepraria* sp., a hyphomycete imitating a lichenicolous habit. *Herzogia* 21: 235–238.
- Braun, U., B. Heuchert & P. Diederich. 2009. Two new and another interesting lichenicolous hyphomycete. *Herzogia* 22: 165–171.
- Braun, U., A. Y. Khodosovtsev, V. V. Darmostuk & P. Diederich. 2016. *Trichoconis hafellneri* sp. nov. on *Athallia pyracea* and *Xanthoria parietina*, a generic discussion of *Trichoconis* and keys to the species of this genus. *Herzogia* 29: 307–314.

- Breuss, O. 1985. On the lichen genera *Placocarpus* and *Placidiopsis* (Verrucariaceae). *Plant Systematics and Evolution* 148: 313–315.
- Breuss, O. 1990. Zwei neue Flechtenarten aus Tenerife (Kanarische Inseln). *Linzer Biologische Beiträge* 22: 327–334.
- Breuss, O. 1994. Über einige wenig bekannte *Verrucaria*-Arten (Lichenes, Verrucariaceae). *Österreichische Zeitschrift für Pilzkunde* 3: 15–20.
- Breuss, O. 1998. On the taxonomy of “*Catapyrenium*” *plumbeum* (lichenized Ascomycetes, Verrucariaceae). *Annalen des Naturhistorischen Museums in Wien* 100B: 671–676.
- Breuss, O. 2007. *Verrucaria*. In: T. H. Nash, III, C. Gries & F. Bungartz (eds.): *Lichen Flora of the Greater Sonoran Desert Region*, Vol. 3. Lichens Unlimited, Arizona State University, Tempe, Arizona, pp. 335–377.
- Breuss, O. 2009. A synopsis of the lichen genus *Placopyrenium* (Verrucariaceae), with descriptions of new taxa and a key to all species. *Bibliotheca Lichenologica* 99: 93–112.
- Bricaud, O. & C. Roux. 1991. *Buellia scheideggeriana* Bricaud et Roux sp. nov., espèce nouvelle de lichen. *Nova Hedwigia* 52: 161–172.
- Cáceres, M. E. S. & R. Lücking. 2000. Three new species and one new combination of foliicolous lichens and lichenicolous fungi from the Atlantic Rainforest in Pernambuco state, Brazil. *Nova Hedwigia* 70: 217–226.
- Cáceres, M. E. S., P. Diederich, R. Lücking & E. Sérusiaux. 2001. *Chiodecton epiphyllum* is a lichenicolous fungus on *Coenogonium flavicans* and belongs in the genus *Plectocarpon* (Arthoniales: Roccellaceae). *Lichenologist* 33: 503–506.
- Cáceres, M. E. S., A. Aptroot & D. Ertz. 2014. New species and interesting records of Arthoniales from the Amazon, Rondônia, Brazil. *Lichenologist* 46: 573–588.
- Calatayud, V. 2004. *Polycoccum*. In: T. H. Nash III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz (eds.): *Lichen Flora of the Greater Sonoran Desert Region*, Vol. 2. Lichens Unlimited, Arizona State University, Tempe, Arizona, pp. 684–686.
- Calatayud, V. & V. Atienza. 1995. *Epaphroconidia hawksworthii* gen. et sp. nov., a new lichenicolous conidial fungus on *Pertusaria pertusa* in Spain. *Mycological Research* 99: 850–852.
- Calatayud, V. & V. Atienza. 2000. *Polycoccum epizoharyi* (Dacampiaceae, Fungi), a new lichenicolous fungus on *Buellia zoharyi* in Spain. *Nova Hedwigia* 70: 265–271.
- Calatayud, V. & E. Barreno. 1995. *Buellia vouauxii* Calatayud & Barreno sp. nov., a new lichenicolous fungus on *Rhizoplaca melanophthalma* (Ramond) Leuckert & Poelt from the Canary Islands. *Cryptogamie, Bryologie-Lichénologie* 16: 257–262.
- Calatayud, V. & E. Barreno. 2003. A new *Lichenostigma* on vagrant *Aspicilia* species. *Lichenologist* 35: 279–285.
- Calatayud, V. & J. Etayo. 1999a. *Codonmyces* and *Lichenostella*, two new genera of lichenicolous conidial fungi. *Lichenologist* 31: 593–601.
- Calatayud, V. & J. Etayo. 1999b. *Fensterconidia caloplacae*, a new sporodochial lichenicolous fungus with catenate conidiogenous cells. *Lichenologist* 31: 587–592.
- Calatayud, V. & J. Etayo. 2001. Five new species of lichenicolous conidial fungi from Spain. *Canadian Journal of Botany* 79: 223–230.
- Calatayud, V. & P. Navarro-Rosinés. 1998. *Weddellomyces xanthoparmeliae* sp. nov. and additions to the chorology of other species of the genus. *Mycotaxon* 69: 503–514.
- Calatayud, V. & P. Navarro-Rosinés. 2000. Contribution to the knowledge of the genus *Lichenostigma* (lichenicolous fungi, Arthoniales), p. 104. In: *The Fourth IAL Symposium, Progress and Problems in Lichenology at the Turn of the Millennium*. Universitat de Barcelona, Barcelona.
- Calatayud, V. & P. Navarro-Rosinés. 2001. *Bellemerella acarosporae* and *B. polysporinae* (Verrucariales), two new species of lichenicolous fungi from Spain. *Nova Hedwigia* 72: 473–478.
- Calatayud, V. & G. Rambold. 1998. Two new species of the lichen genus *Immersaria* (Porpidiaceae). *Lichenologist* 30: 231–244.
- Calatayud, V. & V. J. Rico. 1995. *Polycoccum evae* (Dothideales), a new lichenicolous fungus on *Dimelaena oreina*. *Mycotaxon* 53: 29–32.
- Calatayud, V. & D. Triebel. 1999. *Stigmatidium neofusceliae* (Dothideales s.l.), a new lichenicolous fungus from Spain. *Nova Hedwigia* 69: 439–448.
- Calatayud, V. & D. Triebel. 2001. *Stigmatidium acetabuli* (Dothideales sens. lat.), a new lichenicolous fungus on *Pleurosticta acetabulum*. *Bibliotheca Lichenologica* 78: 27–33.
- Calatayud, V., V. Atienza & E. Barreno. 1995. *Buellia vouauxii* Calatayud & Barreno sp. nov., a new lichenicolous fungus on *Rhizoplaca melanophthalma* (Ramond) Leuckert & Poelt from the Canary Islands. *Cryptogamie, Bryologie-Lichénologie* 16: 257–262.
- Calatayud, V., E. Barreno & O. E. Eriksson. 1997. *Nimisiostella lichenicola* (Lecanorales inc. sed.), a new lichenicolous fungus from Spain. *Systema Ascomycetum* 15: 111–116.
- Calatayud, V., P. Navarro-Rosinés & E. Calvo. 2000. *Lichenochora mediterranea* (Phyllachorales, Ascomycota), a new lichenicolous fungus from Spain. *Lichenologist* 32: 225–231.
- Calatayud, V., J. Etayo & P. Diederich. 2001a. *Paraethariicola aspiciliae* (Ostropales, Odontotremataceae), a new genus and species of lichenicolous fungi. *Lichenologist* 33: 477–482.
- Calatayud, V., M. J. Sanz & A. Aptroot. 2001b. *Lichenopyrenis galligena* (Pleomassariaceae), a new genus of gall-forming lichenicolous fungi on *Leptochidium*. *Mycological Research* 105: 634–637.
- Calatayud, V., P. Navarro-Rosinés & J. Hafellner. 2002. A synopsis of *Lichenostigma* subgen. *Lichenogramma* (Arthoniales), with a key to the species. *Mycological Research* 106: 1230–1242.
- Calatayud, V., E. Barreno & V. J. Rico. 2004a. Two lichenicolous species of *Arthonia* on vagrant *Aspicilia* species. *Bibliotheca Lichenologica* 88: 67–78.
- Calatayud, V., J. Hafellner & P. Navarro-Rosinés. 2004b. *Lichenostigma*. In: Nash, TH, III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz (eds.): *Lichen Flora of the Greater Sonoran Desert Region*, Vol. 2. Lichens Unlimited, Arizona State University, Tempe, Arizona, pp. 664–669.
- Calatayud V., P. Navarro-Rosinés & J. Hafellner. 2013. Contributions to a revision of *Cercidospora* (Dothideales), 2: Species on *Lecanora* s.l., *Rhizoplaca* and *Squamarina*. *Mycosphere* 4: 539–557.
- Candan, M. & M. Halıcı. 2009. Two new lichenicolous *Arthonia* species from Turkey. *Mycotaxon* 107: 209–213.
- Candoussau, F., M. Boqueras, A. Gómez-Bolea, T. Læssøe, R. Lowen, J. D. Rogers, A. Y. Rossman & G. J. Samuels. 2007. Observations on *Neobarya*, including new species and new combinations. *Sydowia* 59: 179–215.
- Chagnon, P. L., J. M. U’Ren, J. Miadlikowska, F. Lutzoni & A. E. Arnold. 2016. Interaction type influences ecological network structure more than local abiotic conditions: Evidence from endophytic and endolichenic fungi at a continental scale. *Oecologia* 180: 181–191.
- Chambers, S. P., D. J. Galloway & P. W. James. 2009. *Carbonea* (Hertel) Hertel (1983). In: C. W. Smith, A. Aptroot, B. J.

- Coppins, A. Fletcher, O. L. Gilbert, P. W. James & P. A. Wolseley (eds): The lichens of Great Britain and Ireland. The British Lichen Society, London, pp. 278–280.
- Christiansen, M. S. 1956. A new species of the formgenus *Lichenocodium* Petr. & Syd. (Fungi Imperfecti), *L. xanthorhiza* sp. n. *Friesia* 5: 212–217.
- Christiansen, M. S. 1980. *Lichenocodium erodens* and some other fungi parasitic on *Lecanora conizaeoides*. *Lichenologist* 12: 149–154.
- Christiansen, M. S. 1993. *Chalara lichenicola* n. sp. (Deuteromycotina), a lichenicolous hyphomycete from Svalbard. *Nordic Journal of Botany* 13: 309–312.
- Clauzade, G. & C. Roux. 1976. Les champignons lichénicoles non lichénisés. Université des Sciences et Techniques du Languedoc, Montpellier.
- Clauzade, G., P. Diederich & C. Roux. 1989. Nelikenigintaj fungoj likenlogaj—Ilustrita determinlibro. Bulletin de la Société Linnéenne de Provence, Numéro spécial 1: 1–142. Cole, M. S. & D. L. Hawksworth. 2001. Lichenicolous fungi, mainly from the USA, including *Patriciomyces* gen. nov. *Mycotaxon* 77: 305–338.
- Cole, M. S. & D. L. Hawksworth. 2002. *Lichenopeltella heterodermiicola*, a new lichenicolous ascomycete on *Heterodermia speciosa* in Arkansas. *Mycotaxon* 83: 391–396.
- Cole, M. S. & D. L. Hawksworth. 2004. *Lichenocodium christiansenii* sp. nov. from *Nodobryoria abbreviata* (Parmeliaceae) in the Pacific Northwest, with a key to the known lichenicolous species. *Lichenologist* 36: 1–6.
- Collin, P. & A. Lauron. 1994. *Omphalina peltigerina* (Peck) P. Collin, champignon lichénicole nouveau pour la France. *Bulletin de la Société Mycologique de France* 110: 11–16.
- Constantinescu, O. & R. Santesson. 1987. *Choreospora* gen. nov., a new lichenicolous hyphomycete from Australia. *Lichenologist* 19: 177–181.
- Coppins, B. J. 1988. *Skyttea refractiva*, a new lichenicolous discomycete. *Notes from the Royal Botanic Garden Edinburgh* 45: 171–173.
- Coppins, B. J. 2009. *Micarea* Fr. (1825). In: C. W. Smith, A. Aptroot, B. J. Coppins, A. Fletcher, O. L. Gilbert, P. W. James & P. A. Wolseley (eds): The lichens of Great Britain and Ireland. The British Lichen Society, London, pp. 583–606.
- Coppins, B. J. & S. Y. Kondratyuk. 1995. *Stygiomyces* and *Pseudonitschkia*: two new genera of lichenicolous fungi. *Edinburgh Journal of Botany* 52: 229–236.
- Coppins, B. J. & S. Y. Kondratyuk. 1998. *Opegrapha trassii* sp. nov., a new lichenicolous fungus on *Heterodermia*. *Folia Cryptogamica Estonica* 32: 9–14.
- Crittenden, P. D., J. C. David, D. L. Hawksworth, F. D. Campbell. 1995. Attempted isolation and success in the culturing of a broad spectrum of lichen-forming and lichenicolous fungi. *New Phytologist* 130: 267–297.
- Crous, P. W., U. Braun, K. Schubert & J. Z. Groenewald. 2007. Delimiting *Cladosporium* from morphologically similar genera. *Studies in Mycology* 58: 33–56.
- Crous, P. W., J. Z. Groenewald & P. Diederich. 2010. *Fusicladium peltigericola*. *Fungal Planet* 54. *Persoonia* 25: 128–129.
- Crous, P. W., L. M. Carris, A. Giraldo, J. Z. Groenewald, D. L. Hawksworth, M. Hernández-Restrepo, W. M. Jaklitsch, M.-H. Lebrun, R. K. Schumacher, J. B. Stielow, E. J. van der Linde, J. Vilcane, H. Voglmayr & A. R. Wood. 2015. The Genera of Fungi – fixing the application of the type species of generic names – G 2: *Allantophomopsis*, *Latorua*, *Macrodiplodiopsis*, *Macrohilum*, *Milospium*, *Protostegia*, *Pyricularia*, *Robillarda*, *Rotula*, *Septoriella*, *Torula*, and *Wojnowicia*. *IMA Fungus* 6: 163–198.
- Darmostuk, V. V., A. Ye. Khodosovtsev, Naumovich G. O. & N. V. Kharechko. 2018. *Roselliniella lecideae* sp. nov. and other interesting lichenicolous fungi from the Northern Black Sea region (Ukraine). *Turkish Journal of Botany* 42: 354–361.
- Darriba, D., G. L. Taboada, R. Doallo & D. Posada. 2012. jModelTest 2: more models, new heuristics and parallel computing. *Nature Methods* 9: 772.
- David, J. C. & J. Etayo. 1995. A new lichenicolous fungus from *Collema: Endococcus caudisporus* sp. nov. (Dothideales, incertae sedis). *Lichenologist* 27: 314–316.
- David, J. C. & D. L. Hawksworth. 1995. *Zevadia*: a new lichenicolous hyphomycete from western Ireland. *Bibliotheca Lichenologica* 58: 63–71.
- de Gruyter J., J. H. Woudenberg, M. M. Aveskamp, G. J. Verkley, J. Z. Groenewald & P. W. Crous. 2010. Systematic reappraisal of species in *Phoma* section *Paraphoma*, *Pyrenochaeta* and *Pleurophoma*. *Mycologia* 102: 1066–81.
- de los Ríos, A. & M. Grube. 2000. Host-parasite interfaces of some lichenicolous fungi in the Decampiaceae (Dothideales, Ascomycota). *Mycological Research* 104: 1348–1353.
- Diederich, P. 1986. Lichenicolous fungi from the Grand Duchy of Luxembourg and surrounding areas. *Lejeunia* n.s. 119: 1–26.
- Diederich, P. 1989. Les lichens épiphytiques et leurs champignons lichénicoles (macrolichens exceptés) du Luxembourg. *Travaux Scientifiques du Musée national d'histoire naturelle de Luxembourg* 14: 1–268.
- Diederich, P. 1990. New or interesting lichenicolous fungi. 1. Species from Luxembourg. *Mycotaxon* 37: 297–330.
- Diederich, P. 1992a. *Stromatopogon baldwinii* Zahlbr., a lichenicolous coelomycete with dimorphic conidia. *Lichenologist* 24: 371–375.
- Diederich, P. 1992b. New or interesting lichenicolous fungi. 2. *Taeniolella beschiana* sp. nov. and *Taeniolella serusiauxii* sp. nov. (Hyphomycetes). *Bulletin de la Société des naturalistes luxembourgeois* 93: 155–162.
- Diederich, P. 1994. New or interesting lichenicolous fungi. 4. *Clauzadeomyces verrucosus* gen. et sp. nov. (Deuteromycotina). *Bulletin de la Société linnéenne de Provence* 45: 417–420.
- Diederich, P. 1995. New or interesting lichenicolous fungi. VI. *Arthonia follmanniana*, a new species from the Galápagos Islands, pp. 179–182. In F. J. A. Daniels, M. Schulz & J. Peine (eds.), *Flechten Follmann. Contributions to Lichenology in Honour of Gerhard Follmann*. Geobotanical and Phytotaxonomical Study Group, Botanical Institute, University of Cologne, Cologne.
- Diederich, P. 1996. The lichenicolous heterobasidiomycetes. *Bibliotheca Lichenologica* 61: 1–198.
- Diederich, P. 2002. *Kalchbrenneriella*, a new genus to accommodate the lichenicolous hyphomycete *Torula cyanescens*. *The Bryologist* 105: 411–414.
- Diederich, P. 2003. New species and new records of American lichenicolous fungi. *Herzogia* 16: 41–90.
- Diederich, P. 2004a. *Abrothallus*. In: T.H. Nash III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz (eds.): *Lichen Flora of the Greater Sonoran Desert Region*, Vol. 2. Lichens Unlimited, Arizona State University, Tempe, Arizona, pp. 626–630.
- Diederich, P. 2004b. *Epicoccum*. In: T.H. Nash III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz (eds.): *Lichen Flora of the Greater Sonoran Desert Region*, Vol. 2. Lichens Unlimited, Arizona State University, Tempe, Arizona, pp. 651–652.
- Diederich, P. 2004c. *Spirographa*. In: T.H. Nash III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz (eds.): *Lichen Flora of the*

- Greater Sonoran Desert Region, Vol. 2. Lichens Unlimited, Arizona State University, Tempe, Arizona, pp. 702–703.
- Diederich, P. 2004d. *Tremella*. In: T.H. Nash III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz (eds.): Lichen Flora of the Greater Sonoran Desert Region, Vol. 2. Lichens Unlimited, Arizona State University, Tempe, Arizona, pp. 710–714.
- Diederich, P. 2007a. New or interesting lichenicolous heterobasidiomycetes. *Opuscula Philolichenum* 4: 11–22.
- Diederich, P. 2007b. *Tremella*. In: T. H. Nash, III, C. Gries & F. Bungartz (eds.): Lichen Flora of the Greater Sonoran Desert Region. Vol. 3. Lichens Unlimited, Arizona State University, Tempe, Arizona, pp. 405–407.
- Diederich, P. 2007c. *Sphaerellothecium gallowayi* sp. nov., a new lichenicolous ascomycete on *Heterodermia* from Australia and Papua New Guinea. *Bibliotheca Lichenologica* 95: 165–169.
- Diederich, P. 2010. *Sclerococcum cladoniae*, a new lichenicolous hyphomycete on *Cladonia* from Luxembourg. *Bulletin de la Société des naturalistes luxembourgeois* 111: 57–59.
- Diederich, P. 2011. Description of *Abrothallus parmotremitis* sp. nov. (lichenicolous Ascomycota). *Bulletin de la Société des naturalistes luxembourgeois* 112: 25–34.
- Diederich, P. 2014. *Aabaarnia* and *Normanogalla*, two new lichenicolous genera of Ostropales, Ascomycota. *Bulletin de la Société des naturalistes luxembourgeois* 115: 141–149.
- Diederich, P. 2015. Two new lichenicolous species of *Sclerococcum* (asexual Ascomycetes) growing on Graphidaceae. *Bulletin de la Société des naturalistes luxembourgeois* 117: 35–42.
- Diederich, P. & U. Braun. 2009. First lichenicolous record of *Acremonium hypholomatis* (anamorphic Ascomycota). *Bulletin de la Société des naturalistes luxembourgeois* 110: 97–99.
- Diederich, P. & M. S. Christiansen. 1994. *Biatoropsis usnearum* Räsänen, and other heterobasidiomycetes on *Usnea*. *Lichenologist* 26: 47–66.
- Diederich, P. & B. Coppins. 2014. *Diplolaeviopsis symmictae* (Helotiales, Ascomycota), a new lichenicolous fungus on *Lecanora symmicta*. *Bulletin de la Société des naturalistes luxembourgeois* 115: 151–155.
- Diederich, P. & D. Ertz. 2018. Lectotypification of *Plectocarpon diedertianum* (Arthoniales). *Herzogia* 31: 322–326.
- Diederich, P. & J. Etayo. 1994. Taxonomic notes on the genus *Plectocarpon* (lichenicolous Ascomycotina). *Nordic Journal of Botany* 14: 589–600.
- Diederich, P. & J. Etayo. 2000. A synopsis of the genera *Skyttea*, *Llimoniella* and *Rhymbocarpus* (lichenicolous Ascomycota, Leotiales). *Lichenologist* 32: 423–485.
- Diederich, P. & J. Etayo. 2004. *Skyttea*. In: T.H. Nash III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz (eds.): Lichen Flora of the Greater Sonoran Desert Region, Vol. 2. Lichens Unlimited, Arizona State University, Tempe, Arizona, pp. 693–695.
- Diederich, P. & J. Lawrey. 2007. New lichenicolous, muscicolous, corticolous and lignicolous taxa of *Burgoa* s.l. and *Marchandiomyces* s.l. (anamorphic Basidiomycota), a new genus for *Omphalina foliacea*, and a catalogue and a key to the non-lichenized, bulbiferous basidiomycetes. *Mycological Progress* 6: 61–80.
- Diederich, P. & D. Puntillo. 1995. New or interesting lichenicolous fungi. 7. *Nectria brutia* sp. nov. (Ascomycotina, Hypocreales). *Bulletin de la Société des naturalistes luxembourgeois* 96: 95–98.
- Diederich, P. & P. Scholz. 1995. New or interesting lichenicolous fungi. 5.—*Sclerococcum leuckertii* spec. nova (Deuteromycotina). *Bibliotheca Lichenologica* 57: 113–116.
- Diederich, P. & E. Sérusiaux. 2003. *Stromatopogon cladoniae* sp. nov., a remarkable new lichenicolous coelomycete from Belgium. *Bibliotheca Lichenologica* 86: 103–106.
- Diederich, P. & P. van den Boom. 2013. Two new lichenicolous species of *Hainesia* (asexual Ascomycetes) growing on *Cladonia*. *Bulletin de la Société des naturalistes luxembourgeois* 114: 59–63.
- Diederich, P. & P. van den Boom. 2017. *Sclerococcum phaeophysciae* and *S. toensbergii*, two new lichenicolous asexual Ascomycetes, with a revised key to the species of *Sclerococcum*. *Bulletin de la Société des naturalistes luxembourgeois* 119: 71–78.
- Diederich, P. & M. Wedin. 2000. The species of *Hemigrapha* (lichenicolous Ascomycetes, Dothideales) on Peltigerales. *Nordic Journal of Botany* 20: 203–214.
- Diederich, P. & M. Zhurbenko. 1997. *Taeniolella rolfi* sp. nov., a new lichenicolous hyphomycete from the Siberian Arctic. *Symbolae Botanicae Upsalienses* 32: 11–16.
- Diederich, P. & M. Zhurbenko. 2001. Nomenclatural notes on *Taeniolella rolfi* (lichenicolous hyphomycetes). *Graphis Scripta* 12: 37–40.
- Diederich, P. & M. P. Zhurbenko. 2009. *Sphaerellothecium phaeorrhizae* and *Zwackhiomyces sipmanii* spp. nov. on *Phaeorrhiza sareptana* from north-eastern Asia, with a key to the species of *Sphaerellothecium*. *Bibliotheca Lichenologica* 99: 113–122.
- Diederich, P., P. van den Boom & A. Aptroot. 2002a ('2001'). *Cladoniicola staurospora* gen. et sp. nov., a new lichenicolous coelomycete from western Europe. *Belgian Journal of Botany* 134: 127–130.
- Diederich, P., M. Zhurbenko & J. Etayo. 2002b. The lichenicolous species of *Odontotrema* (syn. *Lethariicola*) (Ascomycota, Ostropales). *Lichenologist* 3: 479–501.
- Diederich, P., B. Schultheis & M. Blackwell. 2003. *Marchandiobasidium aurantiacum* gen. et sp. nov., the teleomorph of *Marchandiomyces aurantiacus* (Basidiomycota, Ceratobasidiales). *Mycological Research* 107: 523–527.
- Diederich, P., J. Kocourková, J. Etayo & M. Zhurbenko. 2007. The lichenicolous *Phoma* species (coelomycetes) on *Cladonia*. *Lichenologist* 39: 153–163.
- Diederich P., U. Braun, B. Heuchert & D. Ertz, 2010a. Four new lichen-associated *Trimmatostroma* species (hyphomycetes). *Bulletin de la Société des naturalistes luxembourgeois* 111: 47–55.
- Diederich, P., D. Ertz & J. Etayo. 2010b. An enlarged concept of *Llimoniella* (lichenicolous Helotiales), with a revised key to the species and notes on related genera. *Lichenologist* 42: 253–269.
- Diederich, P., J. D. Lawrey, M. Sikaroodi & P. M. Gillevet. 2011a. A new lichenicolous teleomorph is related to plant pathogens in *Laetisaria* and *Limonomyces* (Basidiomycota, Corticiales). *Mycologia* 103: 525–533.
- Diederich, P., J. D. Lawrey, M. Sikaroodi, P. P. G. van den Boom & D. Ertz. 2011b. *Briancoppinsia*, a new coelomycetous genus of Arthoniaceae (Arthoniales) for the lichenicolous *Phoma cytophora*, with a key to this and similar taxa. *Fungal Diversity* 52: 1–12.
- Diederich, P., D. Ertz, J. D. Lawrey, M. Sikaroodi & W. A. Untereiner. 2013. Molecular data place the hyphomycetous lichenicolous genus *Sclerococcum* close to *Dactylospora* (Eurotiomycetes) and *S. parmeliae* in *Cladophialophora* (Chaetothyriales). *Fungal Diversity* 58: 61–72.
- Diederich, P., J. D. Lawrey, M. Capdet, S. Pereira, A. I. Romero, J. Etayo, A. Flakus, M. Sikaroodi & D. Ertz. 2014a. New lichen-associated bulbil-forming species of Cantharellales (Basidiomycetes). *Lichenologist* 46: 333–347.

- Diederich, P., A. M. Millanes & M. Wedin. 2014b. *Tremella umbilicariae* (Tremellomycetes, Basidiomycota), a new lichenicolous species on *Umbilicaria* from Peru. *Bulletin de la Société des naturalistes luxembourgeois* 115: 167–172.
- Diederich, P., R. Lücking, A. Aptroot, H. J. M. Sipman, U. Braun, T. Ahti & D. Ertz. 2017. New species and new records of lichens and lichenicolous fungi from the Seychelles. *Herzogia* 30: 182–236.
- Diederich, P., E. Zimmermann, M. Sikaroodi, M. Ghobad-Nejhad & J. D. Lawrey. 2018. A first lichenicolous *Corticium* species (Corticaceae, Corticiales), described from *Thamnia* in Switzerland. *Bulletin de la Société des naturalistes luxembourgeois* 120 (in press).
- Dillenius, J. J. 1742 [‘1741’]. *Historia Muscorum*. Sheldonian Theatre, Oxford.
- Divakar, P. K., A. Crespo, M. Wedin, S. D. Leavitt, D. L. Hawksworth, L. Myllys, B. McCune, T. Randlane, J. W. Bjerke, Y. Ohmura, I. Schmitt, C. G. Boluda, D. Alors, B. Roca-Valiente, R. Del-Prado, C. Ruibal, K. Buaruang, J. Núñez-Zapata, G. Amo de Paz, V. J. Rico, M. C. Molina, J. A. Elix, T. L. Esslinger, I. K. K. Tronstad, H. Lindgren, D. Ertz, C. Guedan, L. Saag, K. Mark, G. Singh, F. Dal Grande, S. Parnmen, A. Beck, M. Navarro Benatti, D. Blanchon, M. Candan, P. Clerc, T. Goward, M. Grube, B. P. Hodkinson, J.-S. Hur, G. Kantvilas, P. M. Kirika, J. Lendemer, J.-E. Mattsson, M. Inés Messuti, J. Miądlikowska, M. Nelsen, J. I. Ohlson, S. Pérez-Ortega, A. Saag, H. J. M. Sipman, M. Sohrabi, A. Thell, G. Thor, C. Truong, R. Yahr, D. K. Upreti, P. Cubas & H. T. Lumbsch. 2015. Evolution of complex symbiotic relationships in a morphologically derived family of lichen-forming fungi. *New Phytologist* 208: 1217–1226.
- Divakar, P. K., A. Crespo, E. Kraichak, S. D. Leavitt, G. Singh, I. Schmitt & H. T. Lumbsch. 2017. Using a temporal phylogenetic method to harmonize family- and genus-level classification in the largest clade of lichen-forming fungi. *Fungal Diversity* 84: 101–114.
- Döbbeler, P. 1994. *Epigloea urosperma* (Ascomycetes) – ein neuer Flechtenparasit. *Sendtnera* 2: 277–282.
- Driscoll, K. E., S. R. Clayden & R. C. Harris. 2016. *Lecanora insignis* (Lecanoraceae) and its lichenicolous fungi in North America, including a new species of *Skyttea* (Helotiales). *The Bryologist* 119: 039–051.
- Duke, T. & O. W. Purvis. 2009. *Diplotomma* Flot. (1849). In: C. W. Smith, A. Aptroot, B. J. Coppins, A. Fletcher, O. L. Gilbert, P. W. James & P. A. Wolseley (eds): *The lichens of Great Britain and Ireland*. The British Lichen Society, London, pp. 381–383.
- Earland-Bennett, P. M. & D. L. Hawksworth. 1999a. Observations on the genus *Psammia*, including the description of two new algalicolous and lichenicolous species. *Lichenologist* 31: 579–586.
- Earland-Bennett, P. M. & D. L. Hawksworth. 1999b. *Lichenopeltella coppinsii*, a new species on *Verrucaria muralis* from the British Isles. *Lichenologist* 31: 575–578.
- Earland-Bennett, P. M., C. J. B. Hitch & D. L. Hawksworth. 2006. New records and new species of lichens and lichenicolous fungi from Mataelpino (Sierra de Guadarrama, Comunidad de Madrid). *Boletín de la Sociedad Micológica de Madrid* 30: 243–248.
- Edwards, H. G. M., M. R. D. Seaward, T. F. Preece, S. E. Jorge-Villar & D. L. Hawksworth. 2017. Raman spectroscopic analysis of the effect of the lichenicolous fungus *Xanthoriicola physciae* on its lichen host. *Symbiosis* 71: 57–63.
- Egea, J. M. & P. Torrente 1994. El género de hongos liquenizados *Lecanactis* (Ascomycotina). *Bibliotheca Lichenologica* 54: 1–205.
- Elix, J. A. 2015. A new species of the lichen genus *Monerolechia* (Ascomycota, Physciaceae) from Australia. *Telopea* 18: 91–95.
- Elix, J. A. 2018. Three new species and five new records of corticolous and lichenicolous buellioid lichens (Caliciaceae, Ascomycota) from New Zealand’s subantarctic islands. *Australasian Lichenology* 82: 60–67.
- Elix, J. A., G. Kantvilas & P. M. McCarthy. 2017. Thirteen new species and a key to buellioid lichens (Caliciaceae, Ascomycota) in Australia. *Australasian Lichenology* 81: 26–67.
- Eriksson, O. E. & D. L. Hawksworth. 1987. Notes on ascomycete systematics. Nos 225–463. *Systema Ascomycetum* 6: 111–165.
- Eriksson, O. E. & D. L. Hawksworth. 1991. Notes on ascomycete systematics—Nos 969–1127. *Systema Ascomycetum* 9: 1–38.
- Eriksson, O. E. & R. Santesson. 1986. *Lasiosphaeriopsis stereo-caulicola*. *Mycotaxon* 25: 569–580.
- Eriksson, O. E., H. O. Baral, R. S. Currah, K. Hansen, C. P. Kurtzman, T. Laessøe and G. Rambold (Eds.). 2001. Notes on ascomycete systematics. Nos 3128–3302. *Mycotax* 6: 1–26.
- Ertz, D. 2009. Revision of the corticolous *Opegrapha* species from the Paleotropics. *Bibliotheca Lichenologica* 102: 1–176.
- Ertz, D. & P. Diederich. 2003. *Opegrapha cladoniicola*, a new lichenicolous fungus from Hawaii. *Lichenologist* 35: 147–149.
- Ertz, D. & P. Diederich. 2006. The first lichenicolous species of *Schismatomma* (Roccellaceae), *S. physconiicola* sp. nov., from Mexico. *The Bryologist* 109: 415–420.
- Ertz, D. & P. Diederich. 2007. *Plectocarpon*. In: T. H. Nash, III, C. Gries & F. Bungartz: *Lichen flora of the Greater Sonoran Desert Region*. Volume 3. Lichens Unlimited, Arizona State University, Tempe, pp. 402–403.
- Ertz, D. & P. Diederich. 2015. Dismantling Melaspileaceae: a first phylogenetic study of *Buelliella*, *Hemigrapha*, *Karschia*, *Labrocarpon* and *Melaspilea*. *Fungal Diversity* 71: 141–164.
- Ertz, D. & A. M. Fryday. 2017. A remarkable, endohymenial species of *Arthothelium* (Arthoniales) from Campbell Island, New Zealand. *Lichenologist* 49: 93–97.
- Ertz, D. & P. P. G. van den Boom. 2012. *Plectocarpon dirinariæ* (Arthoniales), a new lichenicolous species from Cape Verde. *Lichenologist* 44: 591–593.
- Ertz, D., M. Zhurbenko, P. Diederich & J. Miądlikowska. 2003. A new species of *Plectocarpon* (lichenicolous Roccellaceae, Ascomycota) on *Peltigera*. *The Bryologist* 106: 465–467.
- Ertz, D., P. Diederich & J. Miądlikowska. 2004. The lichenicolous *Opegrapha* species (Roccellaceae, Ascomycota) with 3-septate ascospores on *Pertusaria* and *Ochrolechia*. *Botanical Journal of the Linnean Society* 144: 235–241.
- Ertz, D., C. Christnach, M. Wedin & P. Diederich. 2005. A world monograph of the genus *Plectocarpon* (Roccellaceae, Arthoniales). *Bibliotheca Lichenologica* 91: 1–155.
- Ertz, D., A. Aptroot, B. Van De Vijver, L. Sliwa & C. Moermans. 2014a. Lichens from the Utsteinen Nunatak (Sør Rondane Mountains, Antarctica), with the description of one new species and the establishment of permanent plots. *Phytotaxa* 191: 99–114.
- Ertz, D., J. D. Lawrey, R. S. Common & P. Diederich. 2014b. Molecular data resolve a new order of Arthoniomycetes sister to the primarily lichenized Arthoniales and composed of black yeasts, lichenicolous and rock-inhabiting species. *Fungal Diversity* 66: 113–137.
- Ertz, D., P. Diederich, J. D. Lawrey, F. Berger, C. E. Freebury, B. Coppins, A. Gardiennet & J. Hafellner. 2015. Phylogenetic insights resolve Dacampiaceae (Pleosporales) as polyphyletic: *Didymocytis* (Pleosporales, Phaeosphaeriaceae) with *Phoma*-like

- anamorphs resurrected and segregated from *Polycoccum* (Trypetheliales, Polycoccaceae fam. nov.). *Fungal Diversity* 74: 53–89.
- Ertz, D., B. Heuchert, U. Braun, C. Freebury, R. S. Common & P. Diederich. 2016. Contribution to the phylogeny and taxonomy of the genus *Taeniolella*, with a focus on lichenicolous taxa. *Fungal Biology* 120: 1416–1447.
- Ertz, D., B. Coppins & N. Sanderson. 2018a. The British endemic *Enterographa sorediata* is the widespread *Syncesia myrticola* (Roccellaceae, Arthoniales). *Lichenologist* 50: 153–160.
- Ertz, D., N. Sanderson, A. Łubek & M. Kukwa. 2018b. Two new species of Arthoniaceae from old-growth European forests, *Arthonia thoriana* and *Inoderma sorediatum*, and a new genus for *Schismatomma niveum*. *Lichenologist* 50: 161–172.
- Etayo, J. 1991. *Dactylospora microspora* spec. nov., nuevo hongo liquenícola de la flora española. *Candollea* 46: 391–393.
- Etayo, J. 1993. *Arthonia pantherina* a new species of lichenicolous fungi from north Spain. *Nova Hedwigia* 57: 469–471.
- Etayo, J. 1994. Líquenes y hongos liquenícolas de los Pirineos occidentales, III. *Candollea* 49: 245–249.
- Etayo, J. 1995a. *Mixtoconidium canariense*, a new genus and species of lichenicolous Coelomycetes with dimorphic conidia. *Mycotaxon* 53: 425–432.
- Etayo, J. 1995b. Two new species of lichenicolous fungi from the Pyrenees. *Nova Hedwigia* 61: 189–197.
- Etayo, J. 1996. Aportación a la flora liquénica de las Islas Canarias. I. Hongos liquenícolas de Gomera. *Bulletin de la Société linnéenne de Provence* 47: 93–110.
- Etayo, J. 1998. Some hypocrealean lichenicolous fungi from Southwest Europe. *Nova Hedwigia* 67: 499–509.
- Etayo, J. 2000. Aportación a la flora liquénica de las Islas Canarias. VI. Hongos liquenícolas de La Palma. *Bulletin de la Société linnéenne de Provence* 51: 153–162.
- Etayo, J. 2001. Hongos liquenícolas de Ecuador. I. Dos especies nuevas del orden Hypocreales (Ascomycota): *Pronectria parmotrematis* y *Trichonectria leptogiicola*. *Anales del Jardín Botánico de Madrid* 58: 219–222.
- Etayo, J. 2002a. Aportación al conocimiento de los hongos liquenícolas de Colombia. *Bibliotheca Lichenologica* 84: 1–154.
- Etayo, J. 2002b. Catálogo de líquenes y hongos liquenícolas del Parque Natural de Bértiz (Navarra, España). *Bulletin de la Société linnéenne de Provence* 53: 155–170.
- Etayo, J. 2003. Hongos liquenícolas de Ecuador. II. Dos nuevas especies sobre *Placopsis*. *Anales del Jardín Botánico de Madrid* 60: 19–25.
- Etayo, J. 2007. Two new lichenicolous fungi: an *Opegrapha* and a *Plectocarpon* species (Ascomycota: Roccellaceae) from Chile. *Lichenologist* 39: 543–547.
- Etayo, J. 2008. Líquenes y hongos liquenícolas del LIC de Ablitas (S. Navarra, España). *Cryptogamie, Mycologie* 29: 63–94.
- Etayo, J. 2010a. Lichenicolous fungi from the western Pyrenees. V. Three new ascomycetes. *Opuscula Philolichenum* 8: 131–139.
- Etayo, J. 2010b. Hongos liquenícola de Perú. *Bulletin de la Société linnéenne de Provence* 61: 1–46.
- Etayo, J. 2010c. Líquenes y hongos liquenícolas de Aragón. *Guineana* 16: 1–501.
- Etayo, J. 2011. *Lichenochora hyperphysciae*, a new lichenicolous fungus found in Mexico and Spain. *Bibliotheca Lichenologica* 106: 53–56.
- Etayo, J. 2017. Hongos liquenícolas de Ecuador. *Opera Lilloana* 50: 1–535.
- Etayo, J. 2018a. *Tremella mayrhoferi*, a new lichenicolous species on *Lecanora allophana*. *Herzogia* 31 (in press).
- Etayo, J. 2018b. Lichenicolous fungi of the Azores islands. I. Terceira. *Ascomycete.org*. 10: 107–116.
- Etayo, J. & A. Aptroot. 2006. Líquenes epífitos y hongos liquenícolas de Bahía Honda (Veraguas, Panamá). Epiphytic lichens and lichenicolous fungi from Bahía Honda (Veraguas, Panama). In: Castroviejo, S.; Ibáñez, A.: Estudios sobre la biodiversidad de la región de Bahía Honda (Veraguas, Panamá). Studies on the Biodiversity of the Bahía Honda Region (Veraguas, Panama). *Bibliotheca de Ciencias* 20. Consejo Superior de Investigaciones Científicas Instituto de España, Real Academia de Ciencias Exactas, Físicas y Naturales, Madrid, pp. 63–93.
- Etayo, J. & A. Aptroot. 2017. New and interesting lichens from Panama. *The Bryologist* 120: 501–510.
- Etayo, J. & F. Berger. 2002. Aportación a la flora liquénica de las Islas Canarias. VII. Algunos líquenes y hongos liquenícolas. *Estudios canarios* 47: 9–23.
- Etayo, J. & F. Berger. 2009. *Carnegieispora rimeliae*, a new genus of lichenicolous fungus from the Azores. *Opuscula Philolichenum* 7: 17–20.
- Etayo, J. & F. Berger. 2013. *Isthmoconidium bacidiicola*, a new genus and species of lichenicolous hyphomycetes on *Bacidia* from Bermuda. *Opuscula Philolichenum* 12: 1–5.
- Etayo, J. & O. Breuss. 1996. Líquenes y hongos liquenícolas de los Pirineos occidentales y norte de la Península Ibérica, IV. Cryptogamie, Bryologie-Lichénologie 17: 213–230.
- Etayo, J. & O. Breuss. 1998. New species and interesting records of lichenicolous fungi. *Österreichische Zeitschrift für Pilzkunde* 7: 203–213.
- Etayo, J. & O. Breuss. 2001. *Endococcus incrassatus*, a new lichenicolous fungus (Dothideales). *Österreichische Zeitschrift für Pilzkunde* 10: 315–317.
- Etayo, J. & O. Breuss. 2004. *Stromatopogon geminatum* spec. nova, a further lichenicolous fungus on *Usnea*. *Österreichische Zeitschrift für Pilzkunde* 13: 277–279.
- Etayo, J. & V. Calatayud. 1998. *Sclerococcum* (Deuteromycotina) with black sporodochia in Spain. *Annalen des Naturhistorischen Museums in Wien* 100B: 677–681.
- Etayo, J. & V. Calatayud. 2005. *Taeniolella diderichiana*, a new lichenicolous hyphomycete on *Placopsis*. *Lichenologist* 37: 303–305.
- Etayo, J. & P. Diederich. 1995. Lichenicolous fungi from the western Pyrenees, France and Spain. I. New species of Deuteromycetes. Pages 205–221. In: F. J. A. Daniels, M. Schulz & J. Peine (eds.), *Flechten Follmann. Contributions to Lichenology in Honour of Gerhard Follmann*. Geobotanical and Phytotaxonomical Study Group, Botanical Institute, University of Cologne, Cologne.
- Etayo, J. & P. Diederich. 1996a. Lichenicolous fungi from the western Pyrenees, France and Spain. II. More Deuteromycetes. *Mycotaxon* 60: 415–428.
- Etayo, J. & P. Diederich. 1996b. Lichenicolous fungi from the western Pyrenees, France and Spain. III. Species on *Lobaria pulmonaria*. *Bulletin de la Société des naturalistes luxembourgeois* 97: 93–118.
- Etayo, J. & P. Diederich. 1998. Lichenicolous fungi from the western Pyrenees, France and Spain. IV. Ascomycetes. *Lichenologist* 30: 103–120.
- Etayo, J. & P. Diederich. 2000. *Echinodiscus lesdainii* gen. et comb. nov., a new name for *Phacopsis lesdainii* Vouaux (lichenicolous Ascomycetes, Leotiales). *Bulletin de la Société des naturalistes luxembourgeois* 100: 63–66.

- Etayo, J. & P. Diederich. 2001. *Gyalideopsis floridae*, sp. nov. a new lichenicolous lichen from Florida (Gomphillaceae, Ascomycetes). *The Bryologist* 104: 130–133.
- Etayo, J. & P. Diederich, 2009. *Arthonia protoparmeliopseos*, a new lichenicolous fungus on *Protoparmeliopsis muralis* from Spain and Luxembourg. *Bulletin de la Société des naturalistes luxembourgeois* 110: 93–96.
- Etayo, J. & P. Diederich. 2011. *Rhymbocarpus aggregatus*, a new species of lichenicolous fungi (Helotiales) growing on *Buellia griseovirens* in Spain, with a revised key to species of the genus. *Bulletin de la Société des naturalistes luxembourgeois* 112: 35–38.
- Etayo, J. & P. Navarro-Rosinés. 2008. Una combinación y tres especies nuevas de *Lichenochora* (Phyllachorales, ascomicetes liquenícolas), y notas adicionales para el género. *Revista Catalana de Micologia* 30: 27–44.
- Etayo, J. & H. S. Osorio 2004. Algunos hongos liquenícolas de Sudamérica, especialmente del Uruguay. *Comunicaciones Botánicas Museo Nacional de Historia Natural y Antropología* 129 (6): 1–19.
- Etayo, J. & S. Pérez-Ortega. 2016. Lichenicolous lichens and fungi from Monfragüe National Park (western Spain). *Herzogia* 29: 315–328.
- Etayo, J. & L. G. Sancho. 2006. Two lichenicolous ascomycetes on austral species of *Usnea* (Lecanorales, Ascomycota). *Nova Hedwigia* 83: 483–488.
- Etayo, J. & L. G. Sancho. 2008. Hongos liquenícola del Sur de Sudamérica, especialmente de Isla Navarino (Chile). *Bibliotheca Lichenologica* 98: 302 pp.
- Etayo, J. & D. Triebel. 2010. New and interesting lichenicolous fungi at the Botanische Staatssammlung München. *Lichenologist* 42: 231–240.
- Etayo, J. & P. P. G. van den Boom. 2005. Contribution to the lichen flora of the Canary Islands. VIII. Some lichenicolous fungi. *Nova Hedwigia* 81: 157–162.
- Etayo, J. & P. P. G. van den Boom 2006. Some lichenicolous fungi from Guatemala, with the description of a new species. *Herzogia* 19: 191–197.
- Etayo, J. & P. van den Boom. 2013. A first checklist of lichenicolous fungi from the Dominican Republic, including the description of a new species of *Xenonectriella*. *Opuscula Philolichenum* 12: 142–150.
- Etayo, J. & K. Yazici. 2009. *Microsphaeropsis caloplacae* sp. nov. on *Caloplaca persica* in Turkey. *Mycotaxon* 107: 297–302.
- Etayo, J., A. Flakus & M. Kukwa. 2013a. *Niesslia echinoides* (Niessliaceae, Ascomycota), a new lichenicolous fungus on *Erioderma* from Bolivia. *Lichenologist* 45: 21–24.
- Etayo, J., A. Flakus & M. Kukwa. 2013b. *Capronia paranectrioides* (Herpotrichiellaceae, Ascomycota), a new lichenicolous fungus from Bolivia. *Lichenologist* 45: 623–626.
- Etayo, J., A. Flakus, M. Kukwa & P. Rodríguez Flakus. 2013c. *Lichenochora tertia* (Phyllachorales): the third species of the genus growing on *Xanthoria elegans*. *Mycotaxon* 123: 9–13.
- Etayo, J., A. Flakus, A. Suija & M. Kukwa. 2015. *Macroskyttea parmotrematis* gen. et sp. nov. (Helotiales, Leotiomycetes, Ascomycota), a new lichenicolous fungus from Bolivia. *Phytotaxa* 224: 247–257.
- Etayo, J., A. Flakus & M. Kukwa. 2018. Three new lichenicolous species of the genus *Plectocarpus* (Ascomycota: Lecanographaceae) from the Bolivian Andes. *Phytotaxa* (in press).
- Farkas, E. 2010. Notes and schedae to Lichenes Delicati Exsiccati Editae in memoriam Antonín Vězda (1920–2008), Fasc. 1. *Acta Botanica Hungarica* 52: 331–340.
- Farkas, E. & A. Flakus. 2016. *Trichonectria calopadiicola* sp. nov. (Hypocreales, Ascomycota): The second species of the family Bionectriaceae parasitic on foliicolous lichens discovered in Tanzania. *Phytotaxa* 278: 281–286.
- Fernández-Brime, S., X. Llimona & P. Navarro-Rosinés. 2010. *Lichenostigma rupicola* (Lichenotheliaceae), a new lichenicolous species growing on *Pertusaria rupicola*. *Lichenologist* 42: 241–247.
- Fernández-Mendoza, A. Fleischhacker T. Kopun, M. Grube & L. Muggia. 2017. ITS1 metabarcoding highlights low specificity of lichen mycobiomes at a local scale. *Molecular Ecology* 26: 4811–4830.
- Feuerer, T. & E. Timdal. 2004. *Rhizocarpus*. Pages 456–466. In: Nash, TH, III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz (eds.): *Lichen Flora of the Greater Sonoran Desert Region*, Vol. 2. Lichens Unlimited, Arizona State University, Tempe, Arizona.
- Flakus, A. & M. Kukwa. 2012. New species of lichenicolous fungi from Bolivia. *Lichenologist* 44: 469–477.
- Flakus, A., J. Etayo & M. Kukwa. 2014. *Melaspilea tucumana*, a new gall-forming lichenicolous fungus from the tropical Andes in Bolivia. *Lichenologist* 46: 657–662.
- Fleischhacker, A., M. Grube, T. Kopun, J. Hafellner & L. Muggia. 2015. Community analyses uncover high diversity of lichenicolous fungi in alpine habitats. *Microbial Ecology* 70: 348–360.
- Fleischhacker, A., M. Grube, A. Frisch, W. Obermayer & J. Hafellner. 2016. *Arthonia parietinaria* – A common but frequently misunderstood lichenicolous fungus on species of the *Xanthoria parietina*-group. *Fungal Biology* 120: 1341–1353.
- Follmann, G. & B. C. Werner. 2003. Lichenicolous fungi occurring on Roccellaceae (Arthoniales). I. New species from South America. *Journal of the Hattori Botanical Laboratory* 94: 261–292.
- Frisch, A. & H. Holien. 2018. *Arthonia toensbergii*, a new lichenicolous fungus on *Mycoblastus affinis* from the boreal rainforests in Norway. *Graphis Scripta* 30: 34–43.
- Frisch, A., G. Thor & D. Sheil. 2014a. Four new Arthoniomycetes from Bwindi Impenetrable National Park, Uganda – supported by molecular data. *Nova Hedwigia* 98: 295–312.
- Frisch, A., G. Thor, D. Ertz & M. Grube. 2014b. The Arthonialean challenge: restructuring Arthoniaceae. *Taxon* 63: 727–744.
- Fryday, A. M. 2011. How should we deal with the Antarctic and Subantarctic taxa published by Carroll William Dodge? *Opuscula Philolichenum* 9: 89–98.
- Fryday, A. M. & B. J. Coppins. 2012. New taxa, reports, and names of lichenized and lichenicolous fungi, mainly from the Scottish Highlands. *Lichenologist* 44: 723–737.
- Fryday, A. M. & D. O. Øvstedal. 2012. New species, combinations and records of lichenized fungi from the Falkland Islands (Islas Malvinas). *Lichenologist* 44: 483–500.
- Galloway, D. J. 2004. New lichen taxa and names in the New Zealand mycobiota. *New Zealand Journal of Botany* 42: 105–120.
- Gardiennet, A. & C. Lechat. 2012 ('2011'; published in December 2012). Une nouvelle espèce du genre *Trichonectria* découverte en France, *T. pyrenaica* sp. nov. *Bulletin de la Société mycologique de France* 127: 295–299.
- Gardiennet, A. & C. Roux. 2013. *Sphaerellothecium leratianum* Gardiennet et Cl. Roux sp. nova, champignon lichénicole non lichénisé sur *Brodoa*. *Bulletin de l'Association Française de Lichénologie* 38: 99–109.
- Garnier-Delcourt, M. 2008. *Arrhenia peltigerina*, un basidiomycète lichénicole nouveau pour la mycoflore luxembourgeoise (Basid-

- iomycota, Agaricales, Tricholomataceae). Bulletin de la Société des naturalistes luxembourgeois 109: 3–7.
- Garrido-Benavent, I., U. Søchting, A. de los Ríos Murillo & S. Pérez-Ortega. 2016. *Shackletonia cryodesertorum* (Teloschistaceae, Ascomycota), a new species from the McMurdo Dry Valleys (Antarctica) with notes on the biogeography of the genus *Shackletonia*. Mycological Progress 15: 743–754.
- Gasparyan, A., H. J. M. Sipman & W. von Brackel. 2014. A contribution to the lichen-forming and lichenicolous fungi flora of Armenia. Willdenowia 44: 263–267.
- Gaya, E. & P. Navarro-Rosinés. 2008. Sobre la presencia de *Polycoccum versisporum* (hongos liquenícolas, Dacampiaceae) en los Pirieneos catalanes y la identificación de su hospedante. Revista Catalana de Micologia 30: 71–78.
- Giavarini, V. J. & O. W. Purvis. 2009a. *Cyphelium* Ach. 1815. Pages 365–368. In: C. W. Smith, A. Aptroot, B. J. Coppins, A. Fletcher, O. L. Gilbert, P. W. James & P. A. Wolseley (eds): The lichens of Great Britain and Ireland. The British Lichen Society, London.
- Giavarini, V. J. & O. W. Purvis. 2009b. *Dirina* Fr. 1825. Pages 383–384. In: C. W. Smith, A. Aptroot, B. J. Coppins, A. Fletcher, O. L. Gilbert, P. W. James & P. A. Wolseley (eds): The lichens of Great Britain and Ireland. The British Lichen Society, London.
- Gierl, C. & K. Kalb. 1993. Die Flechtengattung *Dibaeis*. Eine Übersicht über die rosafrüchtigen Arten von *Baeomyces* sens. lat. nebst Anmerkungen zu *Phyllobaeis* gen. nov. Herzogia 9: 593–645.
- Gilbert, O. L. & P. W. James. 2009. *Candelariella* Müll. Arg. 1894. Pages 275–278. In: C. W. Smith, A. Aptroot, B. J. Coppins, A. Fletcher, O. L. Gilbert, P. W. James & P. A. Wolseley (eds): The lichens of Great Britain and Ireland. The British Lichen Society, London.
- Giralt, M. & D. L. Hawksworth. 1991. *Diplolaeviopsis ranula*, a new genus and species of lichenicolous coelomycetes growing on the *Lecanora strobilina* group in Spain. Mycological Research 95: 759–761.
- Giralt, M., P. P. G. van den Boom & J. A. Elix. 2010. *Endohyalina*, the genus in the Physciaceae to accommodate the species of the *Rinodina ericina*-group. Mycological Progress 9: 37–48.
- Girlanda, M., D. Isocrono, C. Bianco & A. M. Luppi-Mosca. 1997. Two foliose lichens as microfungus ecological niches. Mycologia 89: 531–536.
- Gonnet, D., O. Gonnet, A. Gardiennet & C. Roux. 2017. Les lichens et champignons lichénicoles de l'île de Cavallo (archipel des Lavezzi, Corse). Ecologia mediterranea 43: 171–184.
- Grube, M. 2005. *Frigidopyrenia* – a new genus for a particular subarctic lichen, with notes on similar taxa. Phytion (Austria) 45: 305–318.
- Grube, M. & A. de los Ríos. 2001. Observations on *Biatoropsis usnearum*, a lichenicolous heterobasidiomycete, and other gall-forming lichenicolous fungi, using different microscopical techniques. Mycological Research 105: 1116–1122.
- Grube, M. & J. Hafellner. 1990. Studien an flechtenbewohnenden Pilzen der Sammelgattung *Didymella* (Ascomycetes, Dothideales). Nova Hedwigia 51: 283–360.
- Grube, M. & M. Matzer. 1997. Taxonomic concepts of lichenicolous *Arthonia* species. Bibliotheca Lichenologica 68: 1–17.
- Grube, M., M. Matzer & J. Hafellner. 1995. A preliminary account of the lichenicolous *Arthonia* species with reddish, K+ reactive pigments. Lichenologist 27: 25–42.
- Hafellner, J. 1978. *Catolechia* Flotow ex Massalongo emend. Körber und *Epilichen* Clements ex Hafellner – zwei nahe verwandte Flechtengattungen. Nova Hedwigia 30: 673–695.
- Hafellner, J. 1979. *Karschia*. Revision einer Sammelgattung an der Grenze von lichenisierten und nichlichenisierten Ascomyceten. Beiheft zur Nova Hedwigia 62: 1–248.
- Hafellner, J. 1982a. Studien über lichenicole Pilze und Flechten II. *Lichenostigma maureri* gen. et spec. nov., ein in den Ostalpen häufiger lichenicoler Pilz (Ascomycetes, Arthoniales). Herzogia 6: 299–308.
- Hafellner, J. 1982b. Studien über lichenicole Pilze und Flechten I. Die Gattung *Pleoscutula* Vouaux. Herzogia 6: 289–298.
- Hafellner, J. 1982c. Flechtenfunde im Bockfjord, Spitzbergen. (Botanische Ergebnisse der Österreichischen Spitzbergen-Expedition 1979, I). Phytion [Austria] 22: 23–50.
- Hafellner, J. 1985a. Studien über lichenicole Pilze und Flechten III. Die Gattung *Roselliniella* Vainio emend. Haf. (Ascomycotina, Dothideales). Herzogia 7: 145–162.
- Hafellner, J. 1985b. Studien über lichenicole Pilze und Flechten IV. Die auf *Brigantiaea*-Arten beobachteten Ascomyceten. Herzogia 7: 163–180.
- Hafellner, J. 1987a. Studien über lichenicole Pilze und Flechten V. Über die Gattung *Phacopsis* Tul. emend. Körber (Lecanorales). Herzogia 7: 343–352.
- Hafellner, J. 1987b. Studien über lichenicole Pilze und Flechten VI. Ein verändertes Gattungskonzept für *Cercidospora*. Herzogia 7: 353–365.
- Hafellner, J. 1989. Studien über lichenicole Pilze und Flechten VII. Über die neue Gattung *Lichenochora* (Ascomycetes, Phyllachorales). Nova Hedwigia 48: 357–370.
- Hafellner, J. 1993. Über Funde von lichenicolen Pilzen und Flechten im südlichen Norwegen. Herzogia 9: 749–768.
- Hafellner, J. 1994a. Beiträge zu einem Prodromus der lichenicolen Pilze Österreichs und angrenzender Gebiete. I. Einige neue oder seltene Arten. Herzogia 10: 1–28.
- Hafellner, J. 1994b. Über Funde lichenicoler Pilze und Flechten auf Korsika (Frankreich). Bulletin de la Société linnéenne de Provence 44: 219–234.
- Hafellner, J. 1995a. Bemerkenswerte Funde von Flechten und lichenicolen Pilzen auf Makronesischen Inseln. I. Erstnachweise einiger Gattungen, pp. 427–439. In F. J. A. Daniels, M. Schulz & J. Peine (eds.), Flechten Follmann. Contributions to Lichenology in Honour of Gerhard Follmann. Geobotanical and Phytotaxonomical Study Group, Botanical Institute, University of Cologne, Cologne.
- Hafellner, J. 1995b. Bemerkenswerte Funde von Flechten und lichenicolen Pilzen auf makaronesischen Inseln III. Einige bisher auf den Kanarischen Inseln übersehene lecanorale Arten. Linzer Biologische Beiträge 27: 489–505.
- Hafellner, J. 1996a. Studien an lichenicolen Pilzen und Flechten VIII. *Perigrapha*, eine neue Ascomycetengattung für "*Melanotheca*" *superveniens* Nyl. (Arthoniales). Nova Hedwigia 63: 173–181.
- Hafellner, J. 1996b. Bemerkenswerte Funde von Flechten und lichenicolen Pilzen auf makaronesischen Inseln V. Über einige Neufunde und zwei neue Arten. Herzogia 12: 133–145.
- Hafellner, J. 1998a. Studien an lichenicolen Pilzen und Flechten. X. *Arthophacopsis* eine neue Gattung lichenicoler Ascomyceten (Arthoniales). Cryptogamie, Bryologie-Lichénologie 19: 155–168.
- Hafellner, J. 1998b. Studien an lichenicolen Pilzen und Flechten IX. Was ist *Abrothallus friesii* Hepp? Herzogia 13: 139–144.
- Hafellner, J. 1999. Beiträge zu einem Prodromus der lichenicolen pilze Österreichs und angrenzender Gebiete. IV. Drei neue Arten und weitere bemerkenswerte Funde hauptsächlich in der Steiermark. Linzer Biologische Beiträge 31: 507–532.

- Hafellner, J. 2000. Zur Biodiversität lichenisierter und lichenicoler Pilze in den Eisenerzer Alpen (Steiermark). Mitteilungen des Naturwissenschaftlichen Vereines für Steiermark 130: 71–106.
- Hafellner, J. 2001. Studies in lichenicolous fungi and lichens XII: on the genus *Trematosphaeriopsis* (Dothideales). Mycotaxon 80: 381–387.
- Hafellner, J. 2002. Studien an lichenicolen Pilzen und Flechten XI. *Scoliciosporum vouauxii*, eine lichenicole Flechten auf *Ramalina*-Arten. Herzogia 15: 13–18.
- Hafellner, J. 2004a. *Rosellinula*. Pages 689–690. In: T. H. Nash III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz (eds.): Lichen Flora of the Greater Sonoran Desert Region, Vol. 2. Lichens Unlimited, Arizona State University, Tempe, Arizona.
- Hafellner, J. 2004b. Notes on *Scoliciosporum intrusum*. Fritschiana 49: 29–41.
- Hafellner, J. 2004c. A further evolutionary lineage to lichenicolous growth in Physciaceae (Lecanorales). Bibliotheca Lichenologica 88: 175–186.
- Hafellner, J. 2006. Lecideoid lecanoralean ascomycetes invading *Rhizocarpon* subgen. *Rhizocarpon* taxa, with special emphasis on cryptothalline species. Fritschiana 52: 31–48.
- Hafellner, J. 2007. The lichenicolous fungi inhabiting *Tephromela* species. Bibliotheca Lichenologica 96: 103–128.
- Hafellner, J. 2009. *Phacothecium* resurrected and the new genus *Phacographa* (Arthoniales) proposed. Bibliotheca Lichenologica 100: 85–121.
- Hafellner, J. 2011. *Halospora* resurrected and segregated from *Merismatium*. Bibliotheca Lichenologica 106: 75–93.
- Hafellner, J. 2015. Distributional and other data for some species of *Didymocyrtis* (Dothideomycetes, Pleosporales, Phaeosphaeriaceae), including their *Phoma*-type anamorphs. Fritschiana 80: 43–88.
- Hafellner, J. & F. Berger. 2000. Über zwei seltene lichenicole Pilze auf *Trapelia*. Herzogia 14: 31–34.
- Hafellner, J. & V. Calatayud. 1999. *Lichenostigma cosmopolites*, a common lichenicolous fungus on *Xanthoparmelia* species. Mycotaxon 72: 107–114.
- Hafellner, J. & H. Mayrhofer. 2007. A contribution to the knowledge of lichenicolous fungi and lichens occurring in New Zealand. Bibliotheca Lichenologica 95: 225–266.
- Hafellner, J. & W. Obermayer. 1995. *Cercidospora trypteliza* und einige weitere lichenicole Ascomyceten auf *Arthrhoraphis*. Cryptogamie, Bryologie-Lichénologie 16: 177–190.
- Hafellner, J. & J. Poelt 1980. Der “Flechtenparasit” *Buellia pulverulenta*—eine bleibend interne parasitische Flechte. Phytion [Austria] 20: 129–133.
- Hafellner, J. & L. G. Sancho. 1990. Über einige lichenicole Pilze und Flechten aus den Gebirgen Zentralspaniens und den Ostalpen. Herzogia 8: 363–382.
- Hafellner, J., D. Triebel, B. D. Ryan & T. H. Nash III. 2002. On lichenicolous fungi from North America. II. Mycotaxon 84: 293–329.
- Hafellner, J. & R. Türk. 1995. Über Funde lichenicoler Pilze und Flechten im Nationalpark Hohe Tauern (Kärntner Anteil, Österreich). Carinthia II 185/105: 599–635.
- Hafellner, J. & B. Wieser. 2000. Beitrag zur Diversität von Flechten und lichenicolen Pilzen im oststeirischen Hügelland unter besonderer Berücksichtigung der Gebiete mit anstehenden Vulkaniten (Steiermark, Österreich). Fritschiana 23: 1–26.
- Hafellner, J. & E. Zimmermann. 2012. A lichenicolous species of *Pleospora* (Ascomycota) and a key to the fungi invading *Physcia* species. Herzogia 25: 47–59.
- Hafellner, J., W. Petutschnig, C. Taurer-Zeiner & H. Mayrhofer. 2005. Zur Flechtendiversität in den Gurktaler Alpen (Österreich: Kärnten, Steiermark und Salzburg). Herzogia 18: 79–138.
- Hafellner, J., G. Herzog & H. Mayrhofer 2008. Zur Diversität von lichenisierten und lichenicolen Pilzen in den Ennstaler Alpen (Österreich: Steiermark, Oberösterreich). Mitteilungen der Naturwissenschaftlichen Vereines für Steiermark 137: 131–204.
- Hafellner, J., W. Obermayer & M. Tretiach. 2014. *Miriquidica invadens*, an obligate youth parasite on *Sporastatia*, with remarks and a key to species of the *M. griseoatra* group. Lichenologist 46: 303–331.
- Halıci, M. 2008. *Arthonia hawksworthii* sp. nov. (Ascomycota, Arthoniaceae) on *Dimelaena oreina* from Turkey. Mycotaxon 105: 89–93.
- Halıci, M. G. 2010. *Weddellomyces pertusariicola* (Ascomycota, Dacampiaceae), a new species growing on *Pertusaria lactea* in Turkey. Annales Botanici Fennici. 47: 148–150.
- Halıci, M. & M. Candan. 2009. New lichenicolous fungi from Turkey. Nova Hedwigia 88: 483–490.
- Halıci, M. & M. Candan. 2009. New lichenicolous fungi from Turkey. Nova Hedwigia 88: 483–490.
- Halıci, M. G. & M. Candan. 2011. *Arthonia anatolica* sp. nov. (Arthoniaceae) on *Aspicilia contorta* subsp. *hoffmanniana*, a new lichenicolous species from Turkey. Mycotaxon 116: 335–339.
- Halıci, M. G. & D. L. Hawksworth. 2007. Two new species of lichenicolous fungi from Turkey. Lichenologist 39: 439–443.
- Halıci, M. G. & D. L. Hawksworth. 2008. Two new species of *Dacampia* (Ascomycota, Dacampiaceae), with a key to and synopsis of the known species of the genus. Fungal Diversity 28: 49–54.
- Halıci, M. G., A. Orange & A. Aksoy. 2006 (‘2005’). *Weddellomyces turcicus*, a new species on a grey *Acarospora* from Turkey. Mycotaxon 94: 249–252.
- Halıci, M. G., V. Atienza & D. L. Hawksworth. 2007a. Two new *Polycoccum* (Dothideales, Dacampiaceae) species on lichens from Turkey. Mycotaxon 101: 157–163.
- Halıci, M. G., J. Kocourková, P. Diederich & A. Aksoy. 2007b. *Endococcus variabilis*, a new species on *Staurothele areolata*. Mycotaxon 100: 337–342.
- Halıci, M. G., A. Ö. Türk & M. Candan. 2008. *Dacampia cladoniicola* sp. nov. (Ascomycota, Dacampiaceae) on *Cladonia* sp. from Turkey. Mycotaxon 103: 53–57.
- Halıci, M. G., M. Candan & V. Calatayud. 2009a. *Dacampia rubra* sp. nov. (Ascomycota, Dacampiaceae), a lichenicolous fungus on vagrant *Aspicilia* species. Mycotaxon 108: 235–240.
- Halıci, M. G., J. Etayo & M. Candan. 2009b. Two new lichenicolous species of *Dacampia* on Teloschistaceae. Mycotaxon 109: 393–398.
- Halıci, M.G., K. Knudsen, M. Candan & A. Türk. 2009c. A new species of *Polycoccum* (Dothideales, Dacampiaceae) from Turkey. Nova Hedwigia 89: 431–436.
- Halıci, M., M. Kocakaya & A. Aksoy. 2009d. *Lichenostigma anatolicum* sp. nov. (Ascomycota, Lichenotheliaceae) on a brown *Acarospora* from central Turkey. Mycotaxon 108: 67–72.
- Halıci, M. G., D. L. Hawksworth, M. Candan & A. O. Turk. 2010. A new lichenicolous species of *Capronia* (Ascomycota, Herpotrichiellaceae), with a key to the known lichenicolous species of the genus. Fungal Diversity 40: 37–40.
- Halıci, M. G., H. E. Akgül, C. Oztürk & E. Kiliç. 2013. *Polycoccum anatolicum* sp. nov. on *Lepraria incana* and a key to *Polycoccum* species known from Turkey. Mycotaxon 124: 45–50.

- Halıcı, M. G., M. Candan, M. Güllü & A. Özcan. 2014. *Phoma recepiti* sp. nov. from the *Caloplaca cerina* group in Turkey. *Mycotaxon* 129: 163–168.
- Halıcı, M. G., M. Güllü & I. Parnikoza. 2017. *Sagediopsis bayozturkii* sp. nov. on the lichen *Acarospora macrocyclos* from Antarctica with a key to the known species of the genus (Ascomycota, Adelococcaceae). *Polar Record* 53: 271–275.
- Hansen, E. S. & V. Alstrup. 1995. The lichenicolous fungi on *Cladonia* subgenus *Cladina* in Greenland. *Graphis Scripta* 7: 33–38.
- Harada, H. 2000. *Distopyrenis japonica* (Ascomycota, Pyrenulaceae), a new lichen-allied lichenicolous fungus from Chiba-ken, central Japan. *Mycoscience* 41: 491–493.
- Hariharan, G. N., R. K. Mibey & D. L. Hawksworth. 1996. A new species of *Lichenopeltella* on *Porina* in India. *Lichenologist* 28: 294–296.
- Harris, R. C. 1995. More Florida Lichens. Including the 10¢ Tour of the Pyrenolichens. Published by the author, Bronx, NY.
- Harris, R. C. & D. Ladd. 2007. New taxa of lichens and lichenicolous fungi from the Ozark ecoregion. *Opuscula Philolichenum* 4: 57–68.
- Harris, R. C. & J. C. Lendemer. 2009. The *Fellhanera silicis* group in eastern North America. *Opuscula Philolichenum* 6: 157–174.
- Harutyunyan, S., L. Muggia & M. Grube. 2008. Black fungi in lichens from seasonally arid habitats. *Studies in Mycology* 61: 83–90.
- Hawksworth, D. L. 1975. A revision of lichenicolous fungi accepted by Keissler in *Coniothecium*. *Transactions of the British Mycological Society* 65: 219–238.
- Hawksworth, D. L. 1976. New and interesting microfungi from Slapton, South Devonshire: Deuteromycotina III. *Transactions of the British Mycological Society* 67: 51–59.
- Hawksworth, D. L. 1977a. Three new genera of lichenicolous fungi. *Botanical Journal of the Linnean Society* 75: 195–209.
- Hawksworth, D. L. 1977b. Taxonomic and biological observations on the genus *Lichenonium* (Sphaeropsidales). *Persoonia* 9: 159–198.
- Hawksworth, D. L. 1978a. The identities of three species described in *Verrucaria* by Thomas Taylor. *Nova Hedwigia* 30: 549–556.
- Hawksworth, D. L. 1978b. Notes on British lichenicolous fungi: II. Notes from the Royal Botanical Garden Edinburgh 36: 181–197.
- Hawksworth, D. L. 1979a. The lichenicolous hyphomycetes. *Bulletin of the British Museum (Natural History), Botany Series* 6: 183–300.
- Hawksworth, D. L. 1979b. Studies in the genus *Endococcus* (Ascomycotina, Dothideales). *Botaniska Notiser* 132: 283–290.
- Hawksworth, D. L. 1980a. Notes on British lichenicolous fungi: III. Notes from the Royal Botanical Garden Edinburgh 38: 165–183.
- Hawksworth, D. L. 1980b. Notes on some fungi occurring on *Peltigera*, with a key to accepted species. *Transactions of the British Mycological Society* 74: 363–386.
- Hawksworth, D. L. 1981. The lichenicolous coelomycetes. *Bulletin of the British Museum (Natural History), Botany Series* 9: 1–98.
- Hawksworth, D. L. 1982a. Notes on British lichenicolous fungi: IV. Notes from the Royal Botanical Garden Edinburgh 40: 375–397.
- Hawksworth, D. L. 1982b. *Melaspilea canarienses* sp. nov. and other lichenicolous fungi from Tenerife. *Lichenologist* 14: 83–86.
- Hawksworth, D. L. 1982c. Secondary fungi in lichen symbioses: parasites, saprophytes and parasymbionts. *Journal of the Hattori Botanical Laboratory* 52: 357–366.
- Hawksworth, D. L. 1982d. Co-evolution and the detection of ancestry in lichens. *Journal of the Hattori Botanical Laboratory* 52: 323–329.
- Hawksworth, D. L. 1983. A key to the lichen-forming, parasitic, parasymbiotic and saprophytic fungi occurring on lichens in the British Isles. *Lichenologist* 15: 1–44.
- Hawksworth, D. L. 1984. Two interesting lichenicolous Hyphomycetes from Austria. *Beiheft zur Nova Hedwigia* 79: 373–379.
- Hawksworth, D. L. 1985a. A redispotion of the species referred to the ascomycete genus *Microthelia*. *Bulletin of the British Museum (Natural History), Botany Series* 14: 43–181.
- Hawksworth, D. L. 1985b. A new gall-forming *Polycoccum* on *Psormidium versicolor* from Tasmania. *Lichenologist* 17: 298–300.
- Hawksworth, D. L. 1986. Notes on British lichenicolous fungi: V. Notes from the Royal Botanic Garden Edinburgh 43: 497–519.
- Hawksworth, D. L. 1990a. Notes on British lichenicolous fungi: VI. Notes from the Royal Botanic Garden Edinburgh 46: 391–403.
- Hawksworth, D. L. 1990b. *Globosphaeria*, a remarkable new pyrenomycete on *Normandina* from Tasmania. *Lichenologist* 22: 301–305.
- Hawksworth, D. L. 1991a. *Charcotia* Hue, and *Arthonia* species lichenicolous on *Umbilicaria*. *Systema Ascomycetum* 10: 126–134.
- Hawksworth, D. L. 1991b. The fungal dimension of biodiversity: magnitude, significance, and conservation. *Mycological Research* 95: 641–655.
- Hawksworth, D. L. 1994. Notes in British lichenicolous fungi: VII. *Lichenologist* 26: 337–347.
- Hawksworth, D. L. 2001. The magnitude of fungal diversity: the 1.5 million species estimate revisited. *Mycological Research* 105: 1422–1432.
- Hawksworth, D. L. 2003. The lichenicolous fungi of Great Britain and Ireland: an overview and annotated checklist. *Lichenologist* 35: 191–232.
- Hawksworth, D. L. & V. Atienza. 1994. The lichenicolous fungi described by Veli Räsänen. *Acta Botanica Fennica* 150: 47–55.
- Hawksworth, D. L. & M. S. Cole. 2002. *Intralichen*, a new genus for lichenicolous ‘*Bispora*’ and ‘*Trimmatostroma*’ species. *Fungal Diversity* 11: 87–97.
- Hawksworth, D. L. & M. S. Cole. 2004. *Phoma fuliginosa* sp. nov., from *Caloplaca trachyphylla* in Nebraska, with a key to the known lichenicolous species. *Lichenologist* 36: 7–13.
- Hawksworth, D. L. & P. Diederich. 1988. A synopsis of the genus *Polycoccum* (Dothideales), with a key to accepted species. *Transactions of the British Mycological Society* 90: 293–312.
- Hawksworth, D. L. & B. J. Dyko. 1979. *Lichenodiplis* and *Vouauxiomyces*: two genera of lichenicolous Coelomycetes. *Lichenologist* 11: 51–61.
- Hawksworth, D. L. & T. L. Esslinger. 1993. *Haleomyces oropogoncola*, a new pyrenocarpous lichenicolous genus and species on *Oropogon lopezii* in the neotropics. *The Bryologist* 96: 349–354.
- Hawksworth, D. L. & J. Etayo. 2010. *Calongia gibelluloides* gen. sp. nov., a remarkable minute new lichenicolous conidial fungus from northern Spain. *Lichenologist* 42: 355–359.
- Hawksworth, D. L. & J. Etayo. 2011. *Calongea*, *Calongia*, and *Calongeomyces* nom. nov. *Lichenologist* 43: 275–276.
- Hawksworth, D. L. & D. J. Galloway. 1984. The identity of *Plectocarpon* Fee, and its implications for *Lichenomyces pseudocyphellaria* and the typification of *Sticta delisea*. *Lichenologist* 16: 85–89.

- Hawksworth, D. L. & J. Hafellner. 1986. *Phaeosporobolus usneae*, a new and widespread lichenicolous deuteromycete. *Nova Hedwigia* 43: 525–530.
- Hawksworth, D. L. & M. G. Halıcı. 2007. *Gemmaspora*, a new verrucarialean genus with remarkable ascospores for *Adelococcus lecanorae* growing on *Aspicilia* species in Syria and Turkey. *Lichenologist* 39: 121–128.
- Hawksworth, D. L. & A. Henrici. 2015. New resting places for *Laeticorticium quercinum* and *Marchandiobasidium aurantiacum*. *Field Mycology* 16: 16–17.
- Hawksworth, D. L. & T. Iturriaga. 2006. Lichenicolous fungi described from Antarctica and the sub-Antarctic islands by Carroll W. Dodge (1895–1988). *Antarctic Science* 18: 291–301.
- Hawksworth, D. L. & D. Jones. 1981. *Sclerococcum sphaerale* obtained in pure culture. *Transactions of the British Mycological Society* 77: 485–489.
- Hawksworth, D. L. & K. Kalb. 1992. A new species of *Ascochyta* on *Candelariella aurella* from Baja California, Mexico. *The Bryologist* 95: 338–339.
- Hawksworth, D. L. & J. Miądlikowska. 1997a. New species of lichenicolous fungi occurring on *Peltigera* in Ecuador and Europe. *Mycological Research* 101: 1127–1134.
- Hawksworth, D. L. & J. Miądlikowska. 1997b. *Vagnia*, a remarkable coelomycete producing a black columnar cirrus on *Peltigera* in Poland. *Lichenologist* 29: 45–49.
- Hawksworth, D. L. & J. Poelt. 1986. Five additional genera of conidial lichen-forming fungi from Europe. *Plant Systematics and Evolution* 154: 195–211.
- Hawksworth, D. L. & E. Punithalingam. 1973. New and interesting microfungi from Slapton, South Devonshire: Deuteromycotina. *Transactions of the British Mycological Society* 61: 57–69.
- Hawksworth, D. L. & A. Y. Rossman. 1997. Where are all the undescribed fungi? *Phytopathology* 87: 888–891.
- Hawksworth, D. L. & R. Santesson. 1988. *Skyttella*, a new genus for *Phacopsis mulleri* Willey (syn. *Agyrium flavescens* Rehm). *Graphis Scripta* 2: 33–37.
- Hawksworth, D. L. & R. Santesson. 1990. A revision of the lichenicolous fungi previously referred to *Phragmonaevia*. *Bibliotheca Lichenologica* 38: 121–143.
- Hawksworth, D. L., V. V. Atienza, & M. S. Cole. 2004. Lichenicolous species of *Homostegia* (Dothideomycetes), with the description of *H. hertelii* sp. nov., a new fungus on *Flavoparmelia* species. *Bibliotheca Lichenologica* 88: 187–194.
- Hawksworth, D. L., V. Atienza & B. J. Coppins. 2010a. Artificial keys to the lichenicolous fungi of Great Britain, Ireland, the Channel Islands, Iberian Peninsula, and Canary Islands. Fourth draft edition for testing only. Published online by the authors. https://www.ascofrance.fr/uploads/forum_file/LichenKeys2010-0001.pdf
- Hawksworth, D. L., A. M. Millanes & M. Wedin. 2010b. *Roselliiniella* revealed as an overlooked genus of Hypocreales, with the description of a second species on parmelioid lichens. *Persoonia* 24: 12–17.
- Hawksworth, D. L., M. G. Halıcı, Z. Kocakaya & M. Kocakaya. 2016. *Henfellra muriformis* gen. et sp. nov., a new dictyosporous pycnidial fungus on *Candelariella*, with a key to the lichenicolous fungi known from that genus. *Herzogia* 29: 329–336.
- Hawksworth, D. L., T. W. May & S. A. Redhead. 2017. Fungal nomenclature evolving: changes adopted by the 19th International Botanical Congress in Shenzhen, and procedures for the Fungal Nomenclature Session at the 11th International Mycological Congress in Puerto Rico 2018. *IMA Fungus* 8: 211–218.
- Henssen, A. 1995. Studies on the biology and structure of *Dacampia* (Dothideales), a genus with lichenized and lichenicolous species. *Cryptogamic Botany* 5: 149–158.
- Henssen, A. & G. Kantvilas. 1985. *Wawea fruticulosa*, a new genus and species from the Southern Hemisphere. *Lichenologist* 17: 85–97.
- Hertel, H. 1967. Revision einiger calciphiler Formenkreise der Flechtengattung *Lecidea*. Beihefte zur *Nova Hedwigia* 24: 1–155.
- Hertel, H. 1969. *Arthonia intexta* Almqu., ein vielfach verkannter fruchtkörperloser Flechtenparasit. *Berichte der Deutschen Botanischen Gesellschaft* 82: 209–220.
- Hertel, H. & G. Rambold. 1987. *Miriquidica* genus novum Lecanoracearum (Ascomycetes lichenisati). *Mitteilungen der Botanischen Staatssammlung München* 23: 377–392.
- Hertel, H. & G. Rambold. 1990. Zur Kenntnis der Familie Rimulariaceae (Lecanorales). *Bibliotheca Lichenologica* 38: 145–189.
- Heuchert, B. & U. Braun. 2006. On some dematiaceous lichenicolous hyphomycetes. *Herzogia* 19: 11–21.
- Heuchert, B. & U. Braun. 2014. Two new lichen-associated *Trimmatostroma* species. *Herzogia* 27: 227–236.
- Heuchert, B., M. P. Zhurbenko & U. Braun. 2014. Reassessment of the lichenicolous hyphomycete genus *Talpapellis*. *Herzogia* 27: 83–92.
- Heuchert, B., L. G. Sancho, U. Braun & D. L. Hawksworth. 2015. *Bicoloromyces kyffinensis*: a new genus and species of lichen-inhabiting conidial fungi from 83°46'S. *Antarctic Science* 27: 421–428.
- Heuchert, B., U. Braun, P. Diederich & D. Ertz. 2018. Taxonomic monograph of the genus *Taeniolella* s. lat. (Ascomycota). *Fungal Systematics and Evolution* (in press).
- Hibbett, D.S., M. Binder, J.F. Bischoff, M. Blackwell, P.F. Cannon, O.E. Eriksson, S. Huhndorf, T. James, P.M. Kirk, R. Lücking, H.T. Lumbsch, F. Lutzoni, P.B. Matheny, D.J. McLaughlin, M.J. Powell, S. Redhead, C.L. Schoch, J.W. Spatafora, J.A. Stalpers, R. Vilgalys, M.C. Aime, A. Aptroot, R. Bauer, D. Begerow, G.L. Benny, L.A. Castalbury, P.W. Crous, Y.C. Dai, W. Gams, D.M. Geiser, G.W. Griffith, C. Gueidan, D.L. Hawksworth, G. Hestmark, K. Kosaka, R.A. Humber, K.D. Hyde, J.E. Ironside, U. Kõljalg, C.P. Kurtzman, K.-H. Larsson, R. Lichtwardt, J. Longcore, J. Miądlikowska, A. Miller, J.-M. Moncalvo, S. Mozley-Standridge, F. Oberwinkler, E. Parmasto, V. Reeb, J.D. Rogers, C. Roux, L. Ryvarden, J.P. Sampaio, A. Schüßler, J. Sugiyama, R.G. Thorn, L. Tibell, W.A. Untereiner, C. Walker, Z. Wang, A. Weir, M. Weiss, M.M. White, K. Winka, Y.-J. Yao and N. Zhang. 2007. A higher-level classification of the fungi. *Mycological Research* 111: 509–547.
- Hirooka, Y., A. Y. Rossman, G. J. Samuels, C. Lechat & P. Chaverri. 2012. A monograph of *Allantonectria*, *Nectria*, and *Pleonectria* (Nectriaceae, Hypocreales, Ascomycota) and their pycnidial, sporodochial, and synnematosous anamorphs. *Studies in Mycology* 71: 1–210.
- Hoffmann, N. & J. Hafellner. 2000. Eine Revision der lichenicolen Arten der Sammelgattungen *Guignardia* und *Physalospora*. *Bibliotheca Lichenologica* 77: 1–190.
- Hofstetter, V., J. Miądlikowska, F. Kauff & F. Lutzoni. 2007. Phylogenetic comparison of protein-coding versus ribosomal RNA-coding sequence data: A case study of the Lecanoromycetes (Ascomycota). *Molecular Phylogenetics and Evolution* 44: 412–426.
- Holtan-Hartwig, J. & E. Timdal. 1987. Notes on some parasitic *Rhizocarpon* species. *Lichenologist* 19: 335–338.

- Horáková, J. 1994. *Arthonia pragensis* spec. nov. (Ascomycetes, Arthoniales), a new lichenicolous fungus from the Czech Republic. *Czech Mycology* 47: 139–143.
- Horáková, J. & V. Alstrup. 1994. *Arthonia pragensis* spec. nov. (Ascomycetes, Arthoniales), a new lichenicolous fungus from the Czech Republic. *Czech Mycology* 47: 139–143.
- Houmeau, J. M. & C. Roux. 1984. *Hafellnera* Houmeau et Roux gen. nov. genre nouveau de lichen. *Bulletin de la Société Botanique du Centre-Ouest, Nouvelle Serie* 15: 142.
- Huhtinen, S. & R. Santesson. 1997. A new lichenicolous species of *Polydesmia* (Leotiales: Hyaloscyphaceae). *Lichenologist* 29: 205–208.
- Huhtinen, S., D. L. Hawksworth & P. G. Ihlen. 2008. Observations on two glassy-haired lichenicolous discomycetes. *Lichenologist* 40: 549–557.
- Hyde K. D., S. Hongnan, R. Jeewon, D. J. Bhat, E. H. C. McKenzie, E. B. G. Jones, R. Phookamsak, H. A. Ariyawansa, S. Boonmee, Q. Zhao, F. A. Abdel-Aziz, M. A. Abdel-Wahab, S. Banmai, P. Chomnunti, B. K. Cui, D. A. Daranagama, K. Das, M. C. Dayarathne, N. I. de Silva, A. J. Dissanayake, M. Doilom, A. H. Ekanayaka, T. B. Gibertoni, A. Góes-Neto, S. K. Huang, S. C. Jayasiri, R. S. Jayawardena, S. Konta, H. B. Lee, W. J. Li, C. G. Lin, J. K. Liu, Y. Z. Lu, Z. L. Luo, I. S. Manawasinghe, P. Manimohan, A. Mapook, T. Niskanen, C. Norphanphoun, M. Papizadeh, R. H. Perera, C. Phukhamsakda, C. Richter, A. L. C. M. A. de Santiago, E. R. Drechsler-Santos, I. C. Senanayake, K. Tanaka, T. M. D. S. Tennakoon, K. M. Thambugala, Q. Tian, S. Tibpromma, B. Thongbai, A. Vizzini, D. N. Wanasinghe, N. N. Wijayawardene, H. X. Wu, J. Yang, X. Y. Zeng, H. Zhang, J. F. Zhang, T. S. Bulgakov, E. Camporesi, A. H. Bahkali, A. M. Amoozegar, L. S. Araujo-Neta, J. F. Ammirati, A. Baghela, R. P. Bhatt, S. Bojantchev, B. Buyck, G. A. da Silva, C. L. F. de Lima, R. J. V. de Oliveira, C. A. F. de Souza, Y. C. Dai, B. Dima, T. T. Duong, E. Ercole, F. Mafalda-Freire, A. Ghosh, A. Hashimoto, S. Kamolhan, J. C. Kang, S. C. Karunarathna, P. M. Kirk, I. Kytövuori, A. Lantieri, K. Liimatainen, Z. Y. Liu, X. Z. Liu, R. Lücking, G. Medardi, P. E. Mortimer, T. T. T. Nguyen, I. Promputtha, K. N. A. Raj, M. A. Reck, S. Lumyong, S. A. Shahzadeh-Fazeli, M. Stadler, M. R. Soudi, H. Y. Su, T. Takahashi, N. Tangthirasunun, P. Uniyal, Y. Wang, T. C. Wen, J. C. Xu, Z. K. Zhang, Y. C. Zhao, J. Z. Zhou & L. Zhu. 2016. Fungal diversity notes 367–490: taxonomic and phylogenetic contributions to fungal taxa. *Fungal Diversity* 80: 1–270.
- Ihlen, P. G. 1995. The lichenicolous fungi on *Thamnolia vermicularis* in Norway. *Graphis Scripta* 7: 17–24.
- Ihlen, P. G. 1998. The lichenicolous fungi on species of the genera *Baeomyces*, *Dibaeis*, and *Icmadophila* in Norway. *Lichenologist* 30: 27–57.
- Ihlen, P. G. 2004. A new species of *Lichenostigma* (Lichenotheliaceae, Arthoniales) from Scandinavia. *Lichenologist* 36: 183–189.
- Ihlen, P. G. & T. Tønsberg. 1996. The lichenicolous genus *Lettauia* in North America. *The Bryologist* 99: 32–33.
- Ihlen, P. G. & M. Wedin. 2005. Notes on Swedish lichenicolous fungi. *Nova Hedwigia* 81: 493–499.
- Ihlen, P. G. & M. Wedin. 2007. *Cercidospora alpina* sp. nov. and a key to the known species in Fennoscandia. *Lichenologist* 39: 1–6.
- Ihlen, P. G. & M. Wedin. 2008. An annotated key to the lichenicolous Ascomycota (including mitosporic morphs) of Sweden. *Nova Hedwigia* 86: 275–365.
- Ihlen, P. G., H. Holien & T. Tønsberg. 2004a. Two new species of *Dactylospora* (Dactylosporaceae, Lecanorales), with a key to the known species in Scandinavia. *The Bryologist* 107: 357–362.
- Ihlen, P. G., B. Owe-Larsson & T. Tønsberg. 2004b. *Arthonia biatoricola* sp. nov. from north-western Europe and northern Pacific North America. *Symbolae Botanicae Upsalienses* 34: 107–111.
- Isbrand, S. & V. Alstrup. 1992. *Opegrapha sphaerophoricola* sp. nov. *The Bryologist* 95: 233–234.
- Iturriaga, T., D. L. Hawksworth & J. L. Crane. 2008. '*Sporidesmium lichenicola*' sp. nov., a new lichenicolous fungus on *Leptogium* from Venezuela. *Mycologia* 100: 392–396.
- Jaklitsch, W. M., H. O. Baral, R. Lücking & H. T. Lumbsch. 2016. Ascomycota. In: Frey, W. (ed.) *Syllabus of Plant Families – Adolf Engler's Syllabus der Pflanzenfamilien*. Borntraeger, Stuttgart, 288 pp.
- Johnston, P. R., A. K. Seifert, J. K. Stone, A. Y. Rossman & L. Marvanová. 2014. Recommendations on generic names competing for use in Leotiomycetes (Ascomycota). *IMA Fungus* 5: 91–120.
- Joseph, S. & G. P. Sinha. 2015. The lichenicolous species of *Melaspilea* (Melaspileaceae) in India. *Taiwania* 60: 18–22.
- Joshi, S., D. K. Upreti & S. Nayaka. 2013. A new lichenicolous *Arthonia* species (Arthoniaceae) on *Diorygma* from India. *Lichenologist* 45: 323–327.
- Joshi, Y., S. Kondratyuk, L. Lökös, J. P. Halda, S.-O. Oh & J.-S. Hur. 2015. New species and new records of lichenicolous fungi from South Korea. *Mycosphere* 6: 493–500.
- Joshi, Y., A. Falswal, M. Tripathi & J. P. Halda. 2016a ('2017'). *Lichenodiplis ochrolechia*, a new species of lichenicolous fungi from India. *Sydowia* 69: 19–22.
- Joshi, Y., S. Upadhyay, K. Chandra, K. Bisht & A. Falswal. 2016b. A new species of *Plectocarpon* (Roccellaceae, lichenised ascomycetes) from India. *Acta Botanica Hungarica* 58: 257–264.
- Joshi, Y., A. Falswal, R. Bajpai & D. K. Upreti. 2016c. A new species of *Didymocyrtis* (Phaeosphaeriaceae, Ascomycota) growing on *Thamnolia vermicularis* from India. *Kavaka* 46: 27–29.
- Joshi, Y., A. Falswal & J. P. Halda. 2017a. *Polycoccum ochvarianum* – a new species of Dothideomycetes from India. *Sydowia* 69: 147–151.
- Joshi, Y., A. Falswal & R. Joshi. 2017b. A new species of lichenicolous fungus *Epicladonia* from India. *Kavaka* 48: 42–43.
- Jülich, W. 1972. *Monographie der Athelieae* (Corticiaceae, Basidiomycetes). *Willdenowia, Beiheft* 7: 1–283.
- Kalb, K. 1990. *Lichenes Neotropici* ausgegeben von Klaus Kalb. *Fascikel XI* (No. 451–475). Neumarkt/OPf. 12 pp.
- Kalb, K. 2001. New or otherwise interesting lichens. I. *Bibliotheca Lichenologica* 78: 141–167.
- Kalb, K. 2004. New or otherwise interesting lichens II. *Bibliotheca Lichenologica* 88: 301–329.
- Kalb, K. & J. A. Elix. 1995. The lichen genus *Physcidia*. *Bibliotheca Lichenologica* 57: 265–296.
- Kalb, K., J. Hafellner & B. Staiger. 1995. *Haematomma*-studien. II. Lichenicole Pilze auf Arten der Flechtengattung *Haematomma*. *Bibliotheca Lichenologica* 59: 199–222.
- Kalb, K., K. Buaruang, P. Mongkolsuk & K. Boonpragob. 2012. New or otherwise interesting lichens. VI, including a lichenicolous fungus. *Phytotaxa* 42: 35–47.
- Kantvilas, G. & A. Vězda. 1992. Additions to the lichen flora of Tasmania. *Telopea* 4: 661–670.
- Kantvilas, G. & M. Wedin. 2015. Lichenicolous species of the Ascomycete genus *Arthonia* Ach. from Kangaroo Island. *Journal of the Adelaide Botanic Gardens* 29: 1–6.
- Kärnefelt, I., S. Kondratyuk, U. Søchting, P. Frödén & U. Arup. 2002. Two new species of *Caloplaca* (Teloschistaceae) from the Southern Hemisphere. *The Bryologist* 105: 301–309.

- Katoh, K., K. Misawa, K. Kuma & T. Miyata. 2002. MAFFT: a novel method for rapid multiple sequence alignment based on fast Fourier transform. *Nucleic Acids Research* 30: 3059–3066.
- Kaufmann, M. & P. Hofmann. 1998. Beitrag zur Flechtenflora von Vorarlberg (Austria): Pfändergebiet und Leiblachtal im Bezirk Bregenz. *Linzer Biologische Beiträge* 30: 105–125.
- Keissler, K. Von. 1930. Die Flechtenparasiten, Pages 1–712. In: L. Rabenhorst (ed.), *Kryptogamen-Flora von Deutschland, Österreich und der Schweiz*, Band 8. Akademische Verlagsgesellschaft, Leipzig.
- Khodosovtsev, A. Y. & V. V. Darmostuk. 2016. *Pleospora xanthoriae* sp. nov. (Pleosporaceae, Pleosporales), a new lichenicolous fungus on *Xanthoria parietina* from Ukraine, with a key to the known lichenicolous species of *Dacampia* and *Pleospora*. *Opuscula Philolichenum* 15: 6–10.
- Khodosovtsev, A. Y. & V. V. Darmostuk. 2017. *Zwackhiomyces polischukii* sp. nov., and other noteworthy lichenicolous fungi from Ukraine. *Polish Botanical Journal* 62: 27–35.
- Khodosovtsev, A., J. Vondrák, A. Naumovich, J. Kocourková, O. Vondráková & J. Motiejūnaitė. 2012. Three new *Pronectria* species in terricolous and saxicolous microlichen communities (Bionectriaceae, Ascomycota). *Nova Hedwigia* 95: 211–220.
- Khodosovtsev, A. Y., L. M. Gavrylenko & V. M. Klymenko. 2016. *Katherinomyces cetrariae* gen. et sp. nov. (asexual Ascomycota) and *Sphaerellothecium aculeatae* sp. nov. (Mycosphaerellaceae), new lichenicolous fungi on *Cetraria aculeata* in Ukraine. *Nova Hedwigia* 103: 47–55.
- Khodosovtsev, A., V. Darmostuk, A. Suija & A. Ordynets. 2018. *Didymocyrtis trassii* sp. nov. and other lichenicolous fungi on *Cetraria aculeata*. *Lichenologist* (in press).
- Kihlman, A. O. 1891. Neue Beiträge zur Flechten-Flora der Halbinsel Kola. *Meddelanden Soc. Fauna Flora Fenn.* 18: 41–59.
- Kirschner, R., D. Begerow & F. Oberwinkler. 2001. A new *Chionosphaera* species associated with conifer inhabiting bark beetles. *Mycological Research* 105: 1403–1408.
- Knoph, J.-G. 2004. *Cornutispora herteliana*, a new lichenicolous coelomycete from Japan. *Bibliotheca Lichenologica* 88: 345–348.
- Knudsen, K. 2008. *Endococcus janae*, a new species from Peru on *Acarospora rhabarbarina*. *Opuscula Philolichenum* 5: 25–28.
- Knudsen, K. 2011. *Acarospora nashii*, a lichenicolous lichen from western North America. *Bibliotheca Lichenologica* 106: 169–172.
- Knudsen, K. & F. Bungartz. 2014. *Myriospora westbergii* (Acarosporaceae), a new discovery from the Galapagos Islands, Ecuador. *Opuscula Philolichenum* 13: 177–183.
- Knudsen, K. & J. Kocourková. 2008. A study of lichenicolous species of *Polysporina* (Acarosporaceae). *Mycotaxon* 105: 149–164.
- Knudsen, K. & J. Kocourková. 2009. Lichens, lichenicolous and allied fungi of the Santa Monica Mountains, Part 4: additions and corrections to the annotated list. *Opuscula Philolichenum* 7: 29–48.
- Knudsen, K. & J. Kocourková. 2010a. Lichenological notes 1: *Acarosporaceae*. *Mycotaxon* 112: 361–366.
- Knudsen, K. & J. Kocourková. 2010b. A new *Lichenostigma* species (genus incertae sedis) from southern California. *The Bryologist* 113: 229–234.
- Knudsen, K. & J. Kocourková. 2018. *Toninia nashii* is a lichenicolous fungus. *Bulletin of the California Lichen Society* 25: 16–17.
- Knudsen, K. & J. C. Lendemer. 2006. *Sarcopyrenia bacillosa* (Nyl. ex Hasse) Nav.-Ros. & Hladun rediscovered in California. *Evansia* 23: 66–67.
- Knudsen, K. & J. C. Lendemer. 2007. Studies in lichens and lichenicolous fungi: notes on some North American taxa. *Mycotaxon* 101: 81–87.
- Knudsen, K., O. Breuss & J. Kocourková. 2009a. A new species of *Placocarpus* (Verrucariaceae) from southern California. *Lichenologist* 41: 627–630.
- Knudsen, K., J. Kocourková & J. Etayo. 2009b. A new species of *Sphaerellothecium* (Mycosphaerellaceae) on *Placidium lacinulatum*. *Opuscula Philolichenum* 6: 41–44.
- Knudsen, K., J. W. Sheard, J. Kocourková & H. Mayrhofer. 2013. A new lichenicolous lichen from Europe and western North America in the genus *Dimelaena* (Physciaceae). *The Bryologist* 116: 257–262.
- Knudsen, K., O. Breuss & J. Kocourková. 2014. A new lichenicolous *Heteropladidium* (Verrucariaceae) from the deserts of southern California. *Opuscula Philolichenum* 13: 26–33.
- Knudsen, K., J. Kocourková & T. Wheeler. 2015. *Protoparmelia ryaniana* is a synonym of *Lecanora verrucariicola*, which belongs in the genus *Miriquidica* (Lecanoraceae). *Opuscula Philolichenum* 14: 138–142.
- Kocakaya, M., M. G. Halıcı & A. Aksoy. 2011. *Zwackhiomyces turcicus* sp. nov. (Ascomycota, Xanthopyreniaceae) from Turkey. *Mycotaxon* 116: 329–333.
- Kocakaya, Z., M. G. Halıcı & M. Kocakaya. 2015. *Phoma candelariellae* sp. nov., a lichenicolous fungus from Turkey. *Mycotaxon* 130: 1185–1189.
- Kocourková, J. 2009. Observations on the genus *Neolamya*, with the description of the new species *N. xanthoparmeliae* (Ascomycota, genera incertae sedis). *Opuscula Philolichenum* 6: 137–148.
- Kocourková, J. & F. Berger. 1999. *Polycoccum minutulum* (Dothideales, Ascomycetes), a new lichenicolous fungus on *Trapelia placodioides*. *Czech Mycology* 51: 171–177.
- Kocourková, J. & D. L. Hawksworth. 2008. *Acaroconium punctiforme* gen. sp. nov., a new lichenicolous coelomycete on *Acarospora* species and *Sarcogyne regularis*. *Lichenologist* 40: 105–109.
- Kocourková, J. & K. Knudsen. 2009a. A new species of *Stigmidium* (Mycosphaerellaceae, Ascomycetes) from western North America. *Czech Mycology* 61: 73–80.
- Kocourková, J. & K. Knudsen. 2009b. *Stigmidium epistigmellum* (Mycosphaerellaceae), a lichenicolous fungus from maritime *Caloplaca* in North America. *The Bryologist* 112: 578–583.
- Kocourková, J. & K. Knudsen. 2010a. *Stigmidium eucline* is not a synonym of *Stigmidium aggregatum*. *Opuscula Philolichenum* 8: 101–105.
- Kocourková, J. & K. Knudsen. 2010b. A new species of *Dacampia* (Dacampiaceae) on *Lecania fuscella*. *Bibliotheca Lichenologica* 105: 33–36.
- Kocourková, J. & K. Knudsen. 2011a. *Endococcus thelommatis*, a new lichenicolous fungus from Southern California. *Bibliotheca Lichenologica* 106: 173–178.
- Kocourková, J. & K. Knudsen. 2011b. Lichenological notes 2: *Lichenothelia convexa*, a poorly known rock-inhabiting and lichenicolous fungus. *Mycotaxon* 115: 345–351.
- Kocourková, J. & K. Knudsen. 2012. A new species of *Stigmidium* (Mycosphaerellaceae) on *Aspicilia* from North America. *Mycotaxon* 121: 45–52.
- Kocourková, J. & P. P. G. van den Boom. 2005. Lichenicolous fungi from the Czech Republic II. *Arthrorhaphis arctoparmeliae* spec. nov. and some new records for the country. *Herzogia* 18: 23–35.
- Kocourková, J., K. Knudsen & S. Tucker. 2012. A checklist of the lichenicolous biota of California. *Opuscula Philolichenum* 11: 61–103.
- Kondratyuk, S. Y. 1996a. Four new species of lichenicolous fungi, pp. 309–315. In: S. P. Wasser (ed.), *Botany and Mycology for the*

- Next Millennium. Collection of Scientific Articles Devoted to the 70th Anniversary of Academician K. M. Sytnik. N. G. Kholodny Institute of Botany, National Academy of Sciences of Ukraine, Kiev.
- Kondratyuk, S. Y. 1996b. New species of *Pronectria*, *Vouauxiomyces*, *Wentiomyces* and *Zwackhiomyces* from Australasia. *Muelleria* 9: 93–104.
- Kondratyuk, S. Y. 2008. *Polycoccum kaernefeltii* sp. nova (Dothideales), a new lichenicolous fungus on *Teloschistes chrysophthalmus* (L.) Th. Fr. *Ukrainian Botanical Journal* 65: 565–571.
- Kondratyuk, S. Y. & D. J. Galloway. 1995a. Some new species of lichenicolous fungi. *Bibliotheca Lichenologica* 58: 235–244.
- Kondratyuk, S. Y. & D. J. Galloway. 1995b. Two new lichenicolous fungi from *Lobaria* and *Sticta* (Stictaceae). Pages 255–261. In F. J. A. Daniels, M. Schulz & J. Peine (eds.), *Flechten Follmann. Contributions to Lichenology in Honour of Gerhard Follmann*. Geobotanical and Phytotaxonomical Study Group, Botanical Institute, University of Cologne, Cologne.
- Kondratyuk, S. Y. & D. J. Galloway. 1995c. Lichenicolous fungi and chemical patterns in *Pseudocyphellaria*. *Bibliotheca Lichenologica* 57: 327–345.
- Kondratyuk, S. Y. & I. Kudratov. 2002. *Opegrapha romsae* sp. nova (Arthoniales), a new lichenicolous fungus from Tajikistan. *Ukrayins'kyi Botanichnyi Zhurnal* 59: 420–425.
- Kondratyuk, S. Y. & S. D. Zelenko. 2002. New lichens and lichenicolous fungi from Israel and the Near East. *Ukrayins'kyi Botanichnyi Zhurnal* 59: 598–607.
- Kondratyuk, S. Y., D. J. Galloway & D. L. Hawksworth. 1994. *Unguiculariopsis ahtii*, and some other new lichenicolous fungi from *Pseudocyphellaria*. *Acta Botanica Fennica* 150: 93–97.
- Kondratyuk, S. Y., I. Kudratov & U. Bielczyk. 2002. *Lichenodiplisiella makarevichae*, a new lichenicolous coelomycete from Tajikistan. *Polish Botanical Journal* 47: 1–3.
- Kondratyuk, S., I. Kärnefelt, T. Goward, D. Galloway, I. Kudratov, A. Lackovičová, E. Lisická & A. Guttová. 2010. Diagnoses of new taxa. In *Oksner AM: Flora lišajnikov Ukraini y dvoch tomach*, Tom 2, Vypusk 3. Kiiv, Naukovo Dumka: 435–445.
- Kondratyuk, S., L. Lökös, S. Tschabanenko, M. Haji-Moniri, E. Farkas, X. Wang, S.-O. Oh & J.-S. Hur. 2013. New and noteworthy lichen-forming and lichenicolous fungi. *Acta Botanica Hungarica* 55: 275–349.
- Kondratyuk, S. Y., L. Lökös & J.-S. Hur. 2014. New lichen-forming and lichenicolous fungi from Ukraine. *Acta Botanica Hungarica* 56: 361–368.
- Kondratyuk, S., L. Lökös, E. Farkas, S.-O. Oh & J.-S. Hur. 2015. New and noteworthy lichen-forming and lichenicolous fungi 2. *Acta Botanica Hungarica* 57: 77–141.
- Kondratyuk, S., L. Lökös, J. P. Halda, M. Haji Moniri, E. Farkas, J. S. Park, B. G. Lee, S.-O. Oh & J.-S. Hur. 2016a. New and noteworthy lichen-forming and lichenicolous fungi 4. *Acta Botanica Hungarica* 58: 75–136.
- Kondratyuk, S., L. Lökös, S. Tschabanenko, M. H. Moniri, E. Farkas, X. Wang, S.-O. Oh & J.-S. Hur. 2016b. New and noteworthy lichen-forming and lichenicolous fungi: 5. *Acta Botanica Hungarica* 58: 319–396.
- Kondratyuk, S. Y., L. Lökös, J. P. Halda, C. Roux, D. K. Upreti, F. Schumm, H. K. Mishra, S. Nayaka, E. Farkas, J. S. Park, B. G. Lee, D. Liu, J.-J. Woo, J.-S. Hur. 2017. New and noteworthy lichen-forming and lichenicolous fungi 6. *Acta Botanica Hungarica* 59: 137–260.
- Kondratyuk, S. Y., L. Lökös, J. P. Halda, E. Farkas, D. K. Upreti, A. Thell, J.-J. Woo, S.-O. Oh & J.-S. Hur. 2018. New and noteworthy lichen-forming and lichenicolous fungi 7. *Acta Botanica Hungarica* 60: 115–184.
- Kruys, A. & Wedin W. 2009. Phylogenetic relationships and an assessment of traditionally used taxonomic characters in the Sporormiaceae (Pleosporales, Dothideomycetes, Ascomycota), utilising multigene phylogenies. *Systematics and Biodiversity* 7: 465–478.
- Kukwa, M. & P. Diederich. 2005. *Monodictys epilepraria*, a new species of lichenicolous hyphomycetes on *Lepraria*. *Lichenologist* 37: 217–220.
- Kukwa, M., J. Etayo & A. Flakus. 2012. *Plectocarpon stereocaulicola* (Roccellaceae, Ascomycota), a new lichenicolous fungus from Bolivia. *Lichenologist* 44: 479–482.
- Kutorga, E. & D. L. Hawksworth. 1997. A reassessment of the genera referred to the family Patellariaceae (Ascomycota). *Systema Ascomycetum* 15: 1–110.
- Ladd, D. & C. A. Morse. 2018. A new lichenicolous species of *Toninia* (Ramalinaceae) on *Dermatocarpon* in central North America. *The Bryologist* 121: 214–220.
- Lawrey, J. D. 2000. Chemical interactions between two lichen-degrading fungi. *Journal of Chemical Ecology* 26: 1821–1831.
- Lawrey, J. D. & P. Diederich. 2003. Lichenicolous fungi: interactions, evolution and biodiversity. *The Bryologist* 106: 80–120.
- Lawrey, J. D., M. Binder, P. Diederich, M. C. Molina, M. Sikaroodi and D. Ertz. 2007. Phylogenetic diversity of lichen-associated homobasidiomycetes. *Molecular Phylogenetics and Evolution* 44: 778–789.
- Lawrey, J. D., P. Diederich, M. Sikaroodi & P. Gillevet. 2008. Remarkable nutritional diversity in the Corticiales, including a new foliicolous species of *Marchandiomyces* (anamorphic Basidiomycota, Corticiaceae) from Australia. *American Journal of Botany* 95: 816–823.
- Lawrey, J. D., P. Diederich, M. P. Nelsen, C. Freebury, D. Van den Broeck, M. Sikaroodi & D. Ertz. 2012. Phylogenetic placement of lichenicolous *Phoma* species in the Phaeosphaeriaceae (Pleosporales, Dothideomycetes). *Fungal Diversity* 55: 195–213.
- Lawrey, J. D., J. Etayo, M. Dal-Forno, K. E. Driscoll & P. Diederich. 2015. Molecular data support establishment of a new genus for the lichenicolous species *Neobarya usneae* (Hypocreales). *The Bryologist* 118: 83–92.
- Lawrey, J. D., E. Zimmermann, M. Sikaroodi & P. Diederich 2016. Phylogenetic diversity of bulbil-forming lichenicolous fungi in Cantharellales including a new genus and species. *The Bryologist* 119: 341–349.
- Lechat, C., A. Gardiennet & J. Fournier. 2017. First report of a lichenicolous species of *Hypomyces* (Hypocreaceae), *H. peltigericola* sp. nov. *Ascomycete.org* 9(2): 23–26.
- Lendemer, J. C. & R. C. Harris. 2014. Studies in lichens and lichenicolous fungi – No. 19: Further notes on species from the Coastal Plain of southeastern North America. *Opuscula Philolichenum* 13: 155–176.
- Lendemer, J. C., J. Kocourková & K. Knudsen. 2009. Studies in lichen and lichenicolous fungi: more notes on taxa from North America. *Mycotaxon* 108: 491–497.
- Lendemer, J. C., R. C. Harris & A. M. Ruiz. 2016. A review of the lichens of the Dare Regional Biodiversity Hotspot in the Mid-Atlantic Coastal Plain of North Carolina, eastern North America. *Castanea* 81: 1–77.
- Li, W.-C., J. Zhou, S.-Y. Guo, L.-D. Guo. 2007. Endophytic fungi associated with lichens in Baihua mountain of Beijing, China. *Fungal Diversity* 25: 69–80.

- Limona, X. & J. M. Egea. 1984. La vegetación líquénica saxícola de los volcanes del Mar Menor (Murcia, SE de España). *Butll. Inst. Cat. Hist. Nat.* 51: 77–99.
- Lindsay, W. L. 1869. Enumeration of micro-lichens parasitic on other lichens. *Quarterly Journal of Microscopical Science, nouvelle série* 9: 49–57, 135–146, 342–358.
- Liu, J., Hyde, K., Jones, E., Gareth, B., Ariyawansa, H., Bhat, D., Boonmee, S., Maharach-chikumbura, S.N., McKenzie, E.C., Phookamsak, R., Phukhamsakda, C., Shenoy, B., Abdel-Wahab, M., Buyck, B., Chen, J., Chethana, K., Thilini, W., Singtripop, C., Dai, D., Dai, Y., Da-ranagama, D., Dissanayake, A., Doilom, M., D'souza, M., Fan, X., Goonasekara, I., Hirayama, K., Hongsan, S., Jayasiri, S., Jayawardena, R., Karunarathna, S., Li, W., Mapook, A., Nor-phanphoun, C., Pang, K., Perera, R., Persoh, D., Pinruan, U., Senanayake, I., Somrithipol, S., Suetrong, S., Tanaka, K., Thambugala, K., Tian, Q., Tibpromma, S., Udayanga, D., Wijaya-wardene, N., Wanasinghe, D., Wisitrasameewong, K., Zeng, X., Abdel-Aziz, F., Adamčík, S., Bahkali, A., Boonyuen, N., Bulgakov, T., Callac, P., Chomnunti, P., Greiner, K., Hashimoto, A., Hofstetter, V., Kang, J., Lewis, D., Li, X., Liu, X., Liu, Z., Matsumura, M., Mortimer, P., Rambold, G., Randrianjohany, E., Sato, G., Sri-Indrasutdhi, V., Tian, C., Verbeken, A., Brackel, W. von, Wang, Y., Wen, T., Xu, J., Yan, J., Zhao, R. & Camporesi, E. 2015. Fungal diversity notes 1–110: taxonomic and phylogenetic contributions to fungal species. *Fungal Diversity*:1–197.
- Liu, X. Z., Q. M. Wang, M. Göker, M. Groenewald, A. V. Kachalkin, H. T. Lumbsch, A. M. Millanes, M. Wedin, A. M. Yurkov, T. Boekhout, F. Y. Bai. 2016. Towards an integrated phylogenetic classification of the Tremellomycetes. *Studies in Mycology* 81: 85–147.
- Liu, J. K., K. D. Hyde, R. Jeewon, A. J. L. Phillips, S. S. N. Maharachchikumbura, M. Ryberg, Z.-Y. Liu & Q. Zhao. 2017. Ranking higher taxa using divergence times: a case study in Dothideomycetes. *Fungal Diversity* 84: 75–99.
- Löfgren, O. & L. Tibell 1979. *Sphinctrina* in Europe. *Lichenologist* 11: 109–137.
- Looman, J. 1962. Some lichens of Saskatchewan. *The Bryologist* 65: 294–304.
- López de Silanes, M. E., J. Etayo & G. Paz-Bermúdez. 2009. *Pronectria pilosa* (Hypocreaceae) sp. nov. and other lichenicolous fungi found on Collemataceae in the Iberian Peninsula. *The Bryologist* 112: 101–108.
- Lowen, R. 1995. *Acremonium* section *Lichenoidea* section nov. and *Pronectria oligospora* species nov. *Mycotaxon* 53: 81–95.
- Lowen, R. & D. L. Hawksworth. 1986. *Nectriella santessonii*, a new lichenicolous pyrenomycete with an *Acremonium* anamorph. *Lichenologist* 18: 321–328.
- Lowen, R., B. L. Brady, D. L. Hawksworth & R. R. M. Patterson. 1986. Two new lichenicolous species of *Hobsonia*. *Mycologia* 78: 842–846.
- Lowen, R. & P. Diederich. 1990. *Pronectria xanthoriae* and *P. terrestris*, two new lichenicolous fungi (Hypocreales). *Mycologia* 82: 788–791.
- Lücking, R. 1997. Additions and corrections to the knowledge of the foliicolous lichen flora of Costa Rica. *The family Gomphillaceae*. *Bibliotheca Lichenologica* 65: 1–109.
- Lücking, R. 1998. Foliicolous lichens and their lichenicolous fungi collected during the Smithsonian International Cryptogamic Expedition to Guyana 1996. *Tropical Bryology* 15: 45–76.
- Lücking, R. & B. Moncada. 2017. Dismantling *Marchandiomphalina* into *Agonimia* (Verrucariaceae) and *Lawreymyces* gen. nov. (Corticaceae): setting a precedent to the formal recognition of thousands of voucherless fungi based on type sequences. *Fungal Diversity* 84: 119–138.
- Lücking, R. & E. Sérusiaux. 1998. *Gyalideopsis cochlearifer*, a new pantropical, commensalistic species on foliicolous Gomphillaceae. *Lichenologist* 30: 543–549.
- Lücking, R., B. P. Hodkinson & S. D. Leavitt. 2016 [2017]. The 2016 classification of lichenized fungi in the Ascomycota and Basidiomycota – Approaching one thousand genera. *The Bryologist* 119: 361–416.
- Lücking, R., B. P. Hodkinson & S. D. Leavitt. 2017. Corrections and amendments to the 2016 classification of lichenized fungi in the Ascomycota and Basidiomycota. *The Bryologist* 120: 58–69.
- Lumbsch, H. T. 1989. Die holarktischen Vertreter der Flechtengattung *Diploschistes* (Thelotremataceae). *Journal of the Hattori Botanical Laboratory* 66: 133–196.
- Lumbsch, H. T., T. Ahti, S. Altermann, G. Amo De Paz, A. Aptroot, U. Arup, A. Bárcenas Peña, P. A. Bawingan, M. N. Benatti, L. Betancourt, C. R. Björk, K. Boonpragob, M. Brand, F. Bungartz, M. E. S. Cáceres, M. Candan, J. L. Chaves, P. Clerc, R. Common, B. J. Coppins, A. Crespo, M. Dal-Forno, P. K. Divakar, M. V. Duya, J. A. Elix, A. Elvebakk, J. D. Fankhauser, E. Farkas, L. Itatí Ferraro, E. Fischer, D. J. Galloway, E. Gaya, M. Giralt, T. Goward, M. Grube, J. Hafellner, J. E. Hernández M., M. A. Herrera Campos, K. Kalb, I. Kärnefelt, G. Kantvilas, D. Killmann, P. Kirika, K. Knudsen, H. Komposch, S. Kondratyuk, J. D. Lawrey, A. Mangold, M. P. Marcelli, B. McCune, M. I. Messuti, A. Michlig, R. Miranda González, B. Moncada, A. Naikatini, M. P. Nelsen, D. O. Øvstedal, Z. Palice, K. Papong, S. Parnmen, S. Pérez-Ortega, C. Printzen, V. J. Rico, E. Rivas Plata, J. Robayo, D. Rosabal, U. Ruprecht, N. Salazar Allen, L. Sancho, L. Santos De Jesus, T. Santos Vieira, M. Schultz, M. R. D. Seaward, E. Sérusiaux, I. Schmitt, H. J. M. Sipman, M. Sohrabi, U. Søchting, M. Z. Søgaard, L. B. Sparrius, A. Spielmann, T. Spribille, J. Sutjaritturakan, A. Thammathaworn, A. Thell, G. Thor, H. Thüs, E. Timdal, C. Truong, R. Türk, L. Umaña Tenorio, D. K. Upreti, P. van den Boom, M. Vivas Rebuelta, M. Wedin, S. Will-Wolf, V. Wirth, N. Wirtz, R. Yahr, K. Yeshitela, F. Ziemmeck, T. Wheeler & R. Lücking, 2011. One hundred new species of lichenized fungi: a signature of undiscovered global diversity. *Phytotaxa* 18: 1–127.
- Lumbsch, H. T. & S. M. Huhndorf. 2007. Outline of Ascomycota – 2007. *Myconet* 13: 1–58.
- Maddison, W.P. & D.R. Maddison. 2015. Mesquite: a modular system for evolutionary analysis. Version 3.04. Available from: <http://mesquiteproject.org>.
- Martínez, I. & J. Hafellner. 1998. Lichens and lichenicolous fungi on Peltigerales in the Iberian Peninsula and the Canary Islands. *Mycotaxon* 69: 271–310.
- Matzer, M. 1993. Beitrag zur Kenntnis der Ascomycetengattungen *Globosphaeria*, *Roselliniopsis* und *Synaptospora*. *Cryptogamie, Mycologie* 14: 11–19.
- Matzer, M. 1996. Lichenicolous ascomycetes with fissitunicate asci on foliicolous lichens. *Mycological Papers* 171: i–x, 1–202.
- Matzer, M. & J. Hafellner. 1990. Eine Revision der lichenicolous Arten der Sammelgattung *Rosellinia* (ascomycetes). *Bibliotheca Lichenologica* 37: 1–138.
- Matzer, M., H. Mayrhofer, J. Sattler & P. Clerc. 1994. *Rinodina canariensis* (lichenized Ascomycetes, Physciaceae), a new species parasitic on crustose lichens in Macaronesia and the Mediterranean region. *Nordic Journal of Botany* 14: 105–111.

- Mayrhofer, H. 1984a. Die saxicolen Arten der Flechtengattungen *Rinodina* und *Rinodinella* in der Alten Welt. *Journal of the Hattori Botanical Laboratory* 55: 327–493.
- Mayrhofer, H. 1984b. The saxicolous species of *Dimelaena*, *Rinodina* and *Rinodinella* in Australia. *Beiheft zur Nova Hedwigia* 79: 511–536.
- Mayrhofer, H. 1987. Ergänzende Studien zur Taxonomie der Gattung *Protothelenella*. *Herzogia* 7: 313–342.
- Mayrhofer, M. 1987. Studien über die saxicolen Arten der Flechtengattung *Lecania* in Europa I. *Halecania* gen. nov. *Herzogia* 7: 381–406.
- McNeill, J., F. R. Barrie, W. R. Buck, V. Demoulin, W. Greuter, D. L. Hawksworth, P. S. Herendeen, S. Knapp, K. Marhold, J. Prado, W. F. Prud'homme van Reine, G. F. Smith, J. H. Wiersma & N. J. & Turland. 2012. International Code of Nomenclature for algae, fungi, and plants (Melbourne Code) adopted by the Eighteenth International Botanical Congress Melbourne, Australia, July 2011. *Regnum Vegetabile* 154: 1–140.
- Ménard, T. & C. Roux. 1991. *Verrucaria irrubescentis* Menard et Roux sp. nov., espèce nouvelle de lichen. *Biocosme Méditerranéen* 8: 1–10.
- Merinero, S. & Y. Gauslaa. 2017. Specialized fungal parasites reduce fitness of their lichen hosts. *Annals of Botany* 121: 175–182.
- Miądlikowska, J. & V. Alstrup. 1995. Some peltigericolous fungi and lichens mainly from Poland. *Graphis Scripta* 71: 7–10.
- Millanes, A. M., P. Diederich, S. Ekman & M. Wedin. 2011. Phylogeny and character evolution in the jelly fungi (Tremellomycetes, Basidiomycota, Fungi). *Molecular Phylogenetics and Evolution* 61: 12–28.
- Millanes, A. M., M. Westberg, M. Wedin & P. Diederich. 2012. *Tremella diploschistina* (Tremellales, Basidiomycota, Fungi), a new lichenicolous species growing on *Diploschistes*. *Lichenologist* 44: 321–332.
- Millanes, A. M., P. Diederich, M. Westberg, T. Knutsson & M. Wedin. 2014a. *Tremella rhizocarpicola* sp. nov. and other interesting lichenicolous Tremellales and Filobasidiales in the Nordic countries. *MycKeys* 8: 31–41.
- Millanes, A. M., C. Truong, M. Westberg, P. Diederich & M. Wedin. 2014b. Host switching promotes diversity in host-specialized mycoparasitic fungi: uncoupled evolution in the *Biatoropsis-Usnea* system. *Evolution* 68-6: 1576–1593.
- Millanes, A. M., P. Diederich, M. Westberg, E. Pippola & M. Wedin. 2015. *Tremella cetrariellae* (Tremellales, Basidiomycota, Fungi), a new lichenicolous fungus on *Cetrariella delisei*. *Lichenologist* 47: 359–368.
- Millanes, A. M., P. Diederich & M. Wedin. 2016a. *Cyphobasidium* gen. nov., a new lichen-inhabiting lineage in the Cystobasidiomycetes (Pucciniomycotina, Basidiomycota, Fungi), *Fungal Biology*, <http://dx.doi.org/10.1016/j.funbio.2015.12.003>
- Millanes, A. M., P. Diederich, M. Westberg & M. Wedin. 2016b. Three new species in the *Biatoropsis usnearum* complex. *Herzogia* 29: 337–354.
- Miller, M.A., W. Pfeiffer & T. Schwartz. 2010. Creating the CIPRES Science Gateway for inference of large phylogenetic trees. In: *Proceedings of the Gateway Computing Environments Workshop (GCE)*, 14 November, 2010, New Orleans: 1–8.
- Molitor, F. & P. Diederich. 1997. Les pyrénolichens aquatiques du Luxembourg et leurs champignons lichénicoles. *Bulletin de la Société des naturalistes luxembourgeois* 98: 69–92.
- Moreau, F. 1951. Un champignon lichenicole cécidogène, *Phyllosticta galligena*, sp. nov. *Bulletin de la Société Botanique de France* 98: 100–102.
- Moreau, P.-A. 2005. Réflexions sur deux espèces omphaloides du Mercantour. *Annales Confederationis Europaeae Mycologiae Mediterraneensis* [‘2004’], pp. 73–81.
- Morse, C.A. 2013. A new lichenicolous *Enterographa* (Arthoniales, Roccellaceae) from central North America. *Opuscula Philolichenum* 12: 233–240.
- Motiejūnaitė, J. & V. Alstrup. 2006. *Graphium samogiticum* – a new hyphomycete species from Lithuania. *Nova Hedwigia* 83: 249–252.
- Motiejūnaitė, J. & M. Kukwa. 2008. *Pronectria minuta*, a new lichenicolous ascomycete from Poland and Russia. *Mycotaxon* 104: 229–234.
- Muggia, L. & M. Grube. 2010. Fungal composition of lichen thalli assessed by single strand conformation polymorphism. *Lichenologist* 42: 1–13.
- Muggia, L., T. Kopun & D. Ertz. 2015a. Phylogenetic placement of the lichenicolous, anamorphic genus *Lichenodiplis* and its connection to *Muellerella*-like teleomorphs. *Fungal Biology* 119: 1115–1128.
- Muggia, L., J. Kocourková & K. Knudsen. 2015b. Disentangling the complex of *Lichenothelia* species from rock communities in the desert. *Mycologia* 107: 1233–1253.
- Muggia, L., A. Fleischhacker, T. Kopun & M. Grube. 2016. Extremotolerant fungi from alpine rock lichens and their phylogenetic relationships. *Fungal Diversity* 76: 119–142.
- Muggia, L., T. Kopun & M. Grube. 2017. Effects of growth media on the diversity of culturable fungi from lichens. *Molecules* 22: 824.
- Muñoz, D., E. Llop & N. L. Hladun. 2013. *Sphinctrina paramerae*, a new Mediterranean lichenicolous species with non-septate spores. *Lichenologist* 45: 137–143.
- Muntañola-Cvetkovic, M. & A. Gómez-Bolea. 1998. *Arborillus llimonae* nov. gen. et sp., a synnematos lichenicolous hyphomycete. *Mycotaxon* 68: 145–155.
- Muscavitch, Z. M., J. C. Lendemer & R. C. Harris. 2017. A synopsis of the lichenicolous fungi occurring on *Phlyctis* including description of a new *Monodictys* widespread on *P. speirea*. *The Bryologist* 120: 418–426.
- Navarro-Rosinés, P. 1992. Els líquens i els fongs líquenícòles dels substrats carbonatats de Catalunya meridional. Doctoral thesis, Universitat de Barcelona, Facultat de Biologia, Departament de Biologia Vegetal, 459 pp. [electronic version: <http://www.tdx.cat/TDX-0408108-133724>]
- Navarro-Rosinés, P. & J. Etayo. 2001. *Lichenochora epinashii* sp. nov. y *L. sinapispermae* sp. nov. (Phyllachorales, Ascomycetes), dos nuevos hongos líquenícòles sobre *Caloplaca*. *Cryptogamie, Mycologie* 22: 147–158.
- Navarro-Rosinés, P. & J. Hafellner. 1996. *Lichenostigma elongata* spec. nov. (Dothideales), a lichenicolous ascomycete on *Lobothallia* and *Aspicilia* species. *Mycotaxon* 57: 211–225.
- Navarro-Rosinés, P. & N. L. Hladun. 1990. El género *Sarcopyrenia* Nyl. (ascomycetes líquenícòles) en Europa y norte de Africa. *Candollea* 45: 469–488.
- Navarro-Rosinés, P. & N. L. Hladun. 1994. Datos sobre el género *Rhagadostoma* (ascomycetes líquenícòles, Sordariales). *Bulletin de la Société linnéenne de Provence* 45: 431–442.
- Navarro-Rosinés, P. & N. L. Hladun. 1995. *Opegrapha rouxiana* sp. nov., nelikeníginta fungo likenloga ce enpetraj *Polyblastia*. *Bulletin de la Société linnéenne de Provence* 46: 85–90.
- Navarro-Rosinés, P. & N. L. Hladun. 2004. *Sarcopyrenia*. In: T. H. Nash III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz (eds.): *Lichen Flora of the Greater Sonoran Desert Region*, Vol. 2.

- Lichens Unlimited, Arizona State University, Tempe, Arizona, 690–691.
- Navarro-Rosinés, P. & D. Muñiz. 2009. *Skyttea heterochroae* comb. et nom. nov. (Helotiales) un hongo liquenícola propio de *Pertusaria heterochroa*, presente en Cataluña, Islas Baleares y Malta. *Revista Catalana de Micologia* 31: 77–85.
- Navarro-Rosinés, P. & C. Roux. 1990. *Polycoccum opulentum* (Th. Fr. et Almq.) Arnold, nelikeniginta fungo likenloga, ofta sed pretervidita. *Bulletin de la Société linnéenne de Provence* 41: 143–150.
- Navarro-Rosinés, P. & C. Roux. 1995. Le genre *Weddellomyces* (Dothideales, Dacampiaceae) en Catalogne et en Provence. *Mycotaxon* 53: 161–187.
- Navarro-Rosinés, P. & C. Roux. 1996. Le *Clauzadella gordensis* gen. et sp. nov., ascomycète lichénicole non lichénisé (Verrucariales, Verrucariaceae). *Canadian Journal of Botany* 74: 1533–1538.
- Navarro-Rosinés, P. & C. Roux. 1997a. *Bellemerella trapeliae* gen. et sp. nov., Ascomycète lichénicole non lichénisé (Verrucariales, Verrucariaceae). *Mycotaxon* 61: 441–454.
- Navarro-Rosinés, P. & C. Roux. 1997b. *Weddellomyces protearius* sp. nov. et *Lichenochora xanthoriae*, champignons lichénicoles non lichénisés parasites de *Caloplaca proteus*. *Mycotaxon* 61: 433–440.
- Navarro-Rosinés, P. & C. Roux. 1998. *Polycoccum clauzadei* sp. nov. (Ascomycetes, Dothideales), champignon lichénicole non lichénisé sur *Xanthoria elegans*. *Mycotaxon* 69: 327–337.
- Navarro-Rosinés, P. & C. Roux. 2017. *Sphaerellothecium aipolium* Vouaux ex Nav.-Ros. et Cl. Roux sp. nov. (Mycosphaerellaceae, Dothideomycetes), un hongo liquenícola no liquenizado que crece sobre *Physcia*. *Bulletin de la Société linnéenne de Provence* 68: 141–149.
- Navarro-Rosinés, P., C. Roux & X. Llimona. 1994. Nelikenigintaj fungoj ce *Squamarina: Chylococcum epicrassum* comb. nov. kaj *Lichenochora clauzadei* sp. nov. (Ascomycetes). *Bulletin de la Société linnéenne de Provence* 45: 421–429.
- Navarro-Rosinés, P., C. Roux & M. Casares. 1995. Hongos liquenícolas de *Squamarina* II: sobre la identidad de “*Didymella*” *crozalsiana* (Ascomycetes). *Cryptogamie, Bryologie-Lichénologie* 16: 99–103.
- Navarro-Rosinés, P., C. Roux & M. Giralt. 1996a. *Wernerella* gen. nov. (Dothideales, Ascomycetes) un género para incluir *Leptosphaeria maheui* Werner. *Bulletin de la Société linnéenne de Provence* 47: 167–177.
- Navarro-Rosinés, P., V. Calatayud & J. Hafellner. 1996b. The genus *Cercidospora* (Dothideales) in the Mediterranean region and Central Europe. In: *The third symposium – IAL 3 – Progress and problems in lichenology in the nineties*. Salzburg, p. 121.
- Navarro-Rosinés, P., M. Boqueras & C. Roux. 1998a. Nuevos datos para el género *Lichenochora* (Phyllachorales, Ascomycetes liquenícolas). *Bulletin de la Société linnéenne de Provence* 49: 107–124.
- Navarro-Rosinés, P. & C. Roux & O. Bricaud. 1998b. *Sarcopyrenia acutispora* Nav.-Ros. et Cl. Roux sp. nov., nelikeniginta fungo likenloga (Ascomycetes, Verrucariales, Sarcopyreniaceae Nav.-Ros. et Cl. Roux fam. nov.). *Bulletin de la Société linnéenne de Provence* 49: 125–135.
- Navarro-Rosinés, P., C. Roux & P. Diederich. 1998c. *Lichenochora bellemeri* sp. nov., champignon lichénicole non lichénisé (Ascomycetes, Phyllachorales). *Cryptogamie, Bryologie-Lichénologie* 19: 211–219.
- Navarro-Rosinés, P., C. Roux & M. Giralt. 1998d. Validación de *Wernerella maheui* (R.-G. Werner) Nav.-Ros., Cl. Roux et Giralt (Dothideales, Ascomycetes) y adición de una nueva localidad. *Bulletin de la Société linnéenne de Provence* 49: 137–138.
- Navarro-Rosinés, P., J. Etayo & V. Calatayud. 1999. *Rhagadostoma collematum* sp. nov. (ascomycetes liquenícolas, Sordariales) y nuevos datos para otras especies del género. *Bulletin de la Société linnéenne de Provence* 50: 233–241.
- Navarro-Rosinés, P., V. Calatayud & J. Hafellner. 2004. *Cercidospora*. In: T. H. Nash III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz (eds.): *Lichen Flora of the Greater Sonoran Desert Region*, Vol. 2. Lichens Unlimited, Arizona State University, Tempe, Arizona, pp. 635–639.
- Navarro-Rosinés, P., C. Roux & C. Gueidan. 2007. La generoj *Verrucula* kaj *Verruculopsis* (Verrucariaceae, Verrucariales). *Bulletin de la Société linnéenne de Provence* 58: 133–180.
- Navarro-Rosinés, P., V. Calatayud & J. Hafellner. 2009a. Contributions to a revision of the genus *Cercidospora* (Dothideales) 1. Species on Megasporaceae. *Mycotaxon* 110: 5–25.
- Navarro-Rosinés, P., Gueidan, C., Hladun, N. L. & C. Roux. 2009b. Sinopsis del género *Sarcopyrenia* (Ascomycota, hongos liquenícolas), con la descripción de tres nuevas especies. *Revista Catalana de Micologia* 31: 49–69.
- Navarro-Rosinés, P., M. P. Zhurbenko & C. Roux. 2010. *Pseudopyrenidium* nova genro por inkludi *Weddellomyces tartaricola* (nelikeniginta fungo likenloga, Ascomycota). *Bulletin de la Société linnéenne de Provence* 61: 129–140.
- Navarro-Rosinés, P., C. Roux & J. Hafellner. 2018. *Sphaerellothecium pumilum* comb. nov. (hongos liquenícolas, Dothideomycetes), un nombre prioritario sobre *S. aipolium*. *Revista Catalana de Micologia* 39: 117–127.
- Navrotskaya, I. L., S. Y. Kondratyuk, S. P. Wasser, E. Nevo & S. D. Zelenko. 1996. Lichens and lichenicolous fungi new for Israel and other countries. *Israel Journal of Plant Sciences* 44: 181–196.
- Nimis P. L., J. Poelt, M. Tretsch, D. Ottonello, D. Puntillo & A. Vězda. 1994. Contributions to lichen floristics in Italy. VII—The lichens of Marettimo (Egadi Islands, Sicily). *Bulletin de la Société linnéenne de Provence* 45: 247–262.
- Nordin, I. 1964. *Abrothallus succicus*, a common lichenicolous fungus. *Svensk Botanisk Tidskrift* 58: 225–232.
- Nordin, A. & L. Tibell. 2005. Additional species in *Tetramelas*. *Lichenologist* 37: 491–498.
- Obermayer, W. 1993. Die Flechten der Seetaler Alpen (Steiermark, Österreich). *Mitteilungen des Naturwissenschaftlichen Vereines für Steiermark* 123: 91–166.
- Obermayer, W. 1994. Die Flechtengattung *Arthrorhaphis* (Arthrorhaphidaceae, Ascomycotina) in Europa und Grönland. *Nova Hedwigia* 58: 275–333.
- Oksner, A. M. 2010. Flora Lišajnikiv Ukraini y dvoch tomach, Tom 2, Vypusk 3. Kiiv: Naukovo Dumka, 663 pp.
- Olech, M. & V. Alstrup. 1990. *Thelocarpon cyaneum* sp. nov. *Nordic Journal of Botany* 9: 575–576.
- Olech, M. & V. Alstrup. 1996. *Dactylospora dobrowolskii* sp. nov. and additions to the flora of lichens and lichenicolous fungi collected in the Bunge Oasis (East Antarctica). *Polish Polar Research* 17: 165–168.
- Olech, M. & U. Søchting. 1993. Four new species of *Caloplaca* from Antarctica. *Lichenologist* 25: 261–269.
- Olivier, H. 1905–1907. Les principaux parasites de nos lichens français. *Bulletin de l'Académie Internationale de Géographie Botanique* 15: 206–220, 273–284; 16: 42–48, 187–200, 253–264; 17: 123–128, 162–176, 232–240.
- Orange, A. 2002. Lichenicolous fungi on *Ionaspis lacustris*. *Mycotaxon* 81: 265–279.

- Orange, A. 2004. The *Verrucaria fuscella* group in Great Britain and Ireland. *Lichenologist* 36: 173–182.
- Orange, A. 2009. Two parasitic species of *Placopyrenium* (Verrucariaceae) from freshwater habitats in north-west Europe. *Lichenologist* 41: 131–139.
- Orton, P. D. 1977. Notes on British Agarics: V. *Kew Bulletin* 31: 709–721.
- Ott, S. & C. Scheidegger. 1992. The role of parasitism in the co-development and colonization of *Peltula euploca* and *Glyphopeltis ligustica*. *Symbiosis* 12: 159–172.
- Øvstedal, D. O. & D. L. Hawksworth. 1986. Lichenicolous ascomycetes from Bouvetoya. *Norsk Polarinstitutt Skrifter* 185: 57–60.
- Øvstedal, D. O., T. Tønberg & A. Elvebakk. 2009. The lichen flora of Svalbard. *Sommerfeltia* 33: 1–393.
- Page, R. D. M. 2003. Introduction. Pp. 1–21 in R. D. M. Page, ed. *Tangled trees: phylogeny, cospeciation and coevolution*. University of Chicago Press, Chicago.
- Palice, Z., C. Printzen, T. Spribille, M. Svensson, T. Tønberg, I. Urbanavichene, L. S. Yakovchenko & S. Ekman. 2013. Taxonomy of the genus *Myrionora*, with a second species from South America. *The Lichenologist* 45: 159–167.
- Parmasto, E. 1998. *Athelia arachnoidea*, a lichenicolous basidiomycete in Estonia. *Folia Cryptogamica Estonica* 32: 63–66.
- Pérez-Ortega, S. & A. Calatayud. 2009. *Lichenostigma epirupestre*, a new lichenicolous species on *Pertusaria* from Spain. *Mycotaxon* 107: 189–195.
- Pérez-Ortega, S. & J. Etayo. 2008. A new species of *Lecanora* s. lat., growing on *Lasallia pustulata*. *The Lichenologist* 40: 111–118.
- Pérez-Ortega, S. & J. Etayo. 2010. *Labrocarpon* gen. nov. for *Melaspilea canariensis*, with the description of *Buelliella protoparmeliopsis* sp. nov. from South America. *Lichenologist* 42: 271–276.
- Pérez-Ortega, S. & M. G. Halıcı. 2008. *Lasiosphaeriopsis lecanorae* sp. nov. (Ascomycota, Nitschkiaceae) on *Lecanora polytropa* from Spain with a key to the known species of the genus. *Mycotaxon* 104: 247–251.
- Pérez-Ortega, S. & T. Spribille. 2007. *Bellemerella ritae* sp. nov. (Verrucariaceae), a new lichenicolous ascomycete from north-west North America. *Nova Hedwigia* 85: 515–520.
- Pérez-Ortega, S. & T. Spribille. 2009. Three new species of *Lichenopeltella* (Microthyriaceae, Ascomycota) from northwest North America. *Nova Hedwigia* 89: 219–228.
- Pérez-Ortega, S., M. G. Halıcı, K. Knudsen & M. Candan. 2010. A new *Stigmidium* sensu stricto on *Thelenella muscorum*. *Lichenologist* 42: 397–403.
- Pérez-Ortega, S., J. Etayo, J. A. Elix & A. Crespo. 2011a. A new species of *Zwackhiomyces* (Xanthopyreniaceae, Ascomycota) growing on *Austroparmelina* from Australia. *Nova Hedwigia* 93: 395–400.
- Pérez-Ortega, S., J. Etayo & T. Spribille. 2011b. A new species of *Llimoniella* (Ascomycota, Helotiales) on *Ramboldia cinnabarina* from Alaska. *Lichenologist* 43: 363–366.
- Pérez-Ortega, S., A. Suija, A. Crespo & A. de los Ríos. 2014. Lichenicolous fungi of the genus *Abrothallus* (Dothideomycetes: Abrothallales ordo nov.) are sister to the predominantly aquatic Jahnulales. *Fungal Diversity* 64: 295–304.
- Pérez-Ortega, S., I. Garrido-Benavent & A. De Los Ríos. 2015. *Austrostigmidium*, a new austral genus of lichenicolous fungi close to rock-inhabiting meristematic fungi in Teratosphaeriaceae. *Lichenologist* 47: 143–156.
- Pérez-Vargas, I., J. Etayo & C. Hernández-Padrón. 2013. New species of lichenicolous fungi from the Canary Islands. *Phytotaxa* 99: 58–64.
- Petrini, O., U. Hake & M.M. Dreyfuss. 1990. An analysis of fungal communities isolated from fruticose lichens. *Mycologia* 82: 444–451.
- Phookamsak R., Liu J.K., McKenzie E.H.C., Manamgoda D.S., Ariyawansa H., Thambugala K.M., Dai D.Q., Camporesi E., Chukeatirote E., Wijayawardene N.N., Bahkali A.H., Mortimer P.E., Xu J.C. & Hyde K.D. 2014. Revision of Phaeosphaeriaceae. *Fungal Diversity* 68: 159–238.
- Pino-Bodas, R., M. P. Zhurbenko & S. Stenroos. 2017. Phylogenetic placement within Lecanoromycetes of lichenicolous fungi associated with *Cladonia* and some other genera. *Persoonia* 39: 91–117.
- Poelt, J. & W. Obermayer. 1995. *Rhizocarpon mosigiae* spec. nov., ein neuer parasitischer Vertreter der Gattung aus Tirol (Österreich). *Herzogia* 11: 111–113.
- Poelt, J. & A. Vězda. 1984. *Rhizocarpon inimicum* spec. nov. eine weitere parasitische Flechte auf *Lecanora rupicola* spec. coll. *Herzogia* 6: 469–475.
- Prieto, M. & M. Wedin. 2016. Phylogeny, taxonomy and diversification events in the Caliciaceae. *Fungal Diversity* 82: 221–238.
- Prieto, M., E. Baloch, A. Tehler & M. Wedin. 2013. Mazaedium evolution in the Ascomycota (Fungi) and the classification of mazaediata groups of unclear relationship. *Cladistics* 29: 296–308.
- Punithalingam, E. 2003. Nuclei, micronuclei and appendages in tri- and tetra-radiate conidia of *Cornutispora* and four other coelomycete genera. *Mycological Research* 107: 917–948.
- Punithalingam, E. & B. M. Spooner. 1997. *Phaeoseptoria peltigerae* sp. nov. associated with the lichen *Peltigera horizontalis*. *Mycological Research* 101: 292–294.
- Purvis, O. W., B. J. Coppins, D. L. Hawksworth, P. W. James & D. M. Moore. 1992. *The Lichen Flora of Great Britain and Ireland*. Natural History Museum Publications, London.
- Quaedvlieg, W., Verkley, G. J. M., Shin, H.-D., Barretto, R.W., Alfenas, A.C., Swart, W.J., Groenewald, J.Z. & Crous, P.W. 2013. Sizing up Septoria. *Studies in Mycology* 75: 307–390.
- Rambaut, A. 2012. FigTree v1.4.2, available from: <http://tree.bio.ed.ac.uk/software/figtree>
- Rambold, G. 1993. Further species of the genus *Tephromela* (Lecanorales). *Sendtnera* 1: 281–288.
- Rambold, G. & D. Triebel. 1990. *Gelatinopsis*, *Geltingia* and *Phaeopyxis*: three helotialean genera with lichenicolous species. *Notes from the Royal Botanic Garden Edinburgh* 46: 375–389.
- Rambold, G. & D. Triebel. 1992. The inter-lecanoralean associations. *Bibliotheca Lichenologica* 48: 1–201.
- Réblová, M., W. A. Untereiner & K. Réblová. 2013. Novel evolutionary lineages revealed in the Chaetothyriales (Fungi) based on multigene phylogenetic analyses and comparison of ITS secondary structure. *PLoS One* 8(5): 1–28.
- Réblová, M., W. A. Untereiner, V. Štěpánek & W. Gams. 2017. Disentangling *Phialophora* section *Catenulatae*: disposition of taxa with pigmented conidiophores and recognition of a new subclass, Sclerococcomycetidae (Eurotiomycetes). *Mycological Progress* 16: 27–46.
- Redhead, S. A., F. Lutzoni, J.-M. Moncalvo & R. Vilgalys. 2002. Phylogeny of agarics: partial systematics solutions for core omphalinoid genera in the Agaricales (Euagarics). *Mycotaxon* 83: 19–57.

- Renobales, G. 1996. Contribución al conocimiento de los líquenes calcícolas del occidente de Vizcaya y parte oriental de Cantabria (N-España). *Guineana* 2, Servicio Editorial de la Universidad del País Vasco, Bilbao, 310 pp.
- Roberts, P. 1997. New heterobasidiomycetes from Great Britain. *Mycotaxon* 63: 195–216.
- Ronquist, F. & J.P. Huelsenbeck. 2003. MrBayes 3: Bayesian phylogenetic inference under mixed models. *Bioinformatics* 19: 1572–1574.
- Rossmann, A. Y., G. J. Samuels, C. T. Rogerson & R. Lowen. 1999. Genera of Bionectriaceae, Hypocreaceae and Nectriaceae (Hypocreales, Ascomycetes). *Studies in Mycology* 42: 1–248.
- Roux, C. (et coll.). 2014. Catalogue des lichens et champignons lichénicoles de France métropolitaine. H. des Abbayes, 1525 pp.
- Roux, C. & C. Gueidan. 2011. Deux espèces nouvelles de Verrucariaceae des Pyrénées-Orientales (France): *Placocarpus melanophthalmosus* sp. nov. et *Placopyrenium breussii* sp. nov. *Bulletin de la Société linnéenne de Provence*, n° spécial 14: 163–176.
- Roux, C. & P. Navarro-Rosinés. 1994. *Stigmidium clauzadei* sp. nov., nelikeniginta fungo likenloga (Ascomycetes). *Bulletin de la Société linnéenne de Provence* 44: 443–450.
- Roux, C. & D. Triebel. 1994. Révision des espèces de *Stigmidium* et de *Sphaerellothecium* (champignons lichénicoles non lichénisés, Ascomycetes) correspondant à *Pharcidia epicymatia* sensu Keissler ou à *Stigmidium schaeferi* auct. *Bulletin de la Société linnéenne de Provence* 45: 451–542.
- Roux, C., O. Bricaud, E. Sérusiaux & C. Coste. 1994. *Wentomyces lichenicola* subsp. nov. *bouteillei* champignon lichénicole non lichénisé (Dothideales, Dimeriaceae). *Mycotaxon* 50: 459–474.
- Roux, C., D. Triebel, O. Bricaud & D. Le Coeur. 1995. Le *Stigmidium lecidellae* sp. nov. et remarques sur le genre *Stigmidium* (champignons lichénicoles non lichénisés, Ascomycètes). *Canadian Journal of Botany* 73: 662–672.
- Roux, C., J. Etayo, O. Bricaud & D. Le Coeur. 1997. Les *Refractohilum* (Hyphomycètes, Moliniacés) à conidies pluri-septées en Europe et au Canada. *Canadian Journal of Botany* 75: 1592–1600.
- Roux, C., P. Navarro-Rosinés, & F. Tranchida. 1998. *Stigmidium bellemerei* sp. nov., champignon lichénicole non lichénisé (Verrucariales). *Cryptogamie, Bryologie-Lichénologie* 19: 221–228.
- Roux, C., C. Gueidan & P. Navarro-Rosinés. 2002. La position systématique de *Polyblastia diminuta*. *Mycotaxon* 84: 1–20.
- Ruibal, C. A. M. Millanes & D. L. Hawksworth. 2011. Molecular phylogenetic studies on the lichenicolous *Xanthoriicola physciae* reveal Antarctic rock-inhabiting fungi and *Piedraia* species among closest relatives in the Teratosphaeriaceae. *IMA Fungus* 2: 97–103.
- Ryan, B. D., H. T. Lumbsch, M. I. Messuti, C. Printzen, L. Sliwa & T. H. Nash III. 2004. *Lecanora*. Pages 176–286. In: T. H. Nash III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz. (eds.): *Lichen Flora of the Greater Sonoran Desert Region*, Vol. 2. Lichen Unlimited, Arizona State University, Tempe, Arizona.
- Samuels, G. J. 1988. Fungicolous, lichenicolous, and myxomyceticolous species of *Hypocreopsis*, *Nectriopsis*, *Nectria*, *Peristomialis*, and *Trichonectria*. *Memoirs of the New York Botanical Garden* 48: 1–78.
- Santesson, R. 1988. Fungi Lichenicoli Exsiccati, Fasc. 5–6 (Nos 101–150). *Thunbergia* 6: 1–18.
- Santesson, R. 1989. Parasymbiotic fungi on the lichen-forming basidiomycete *Omphalina foliacea*. *Nordic Journal of Botany* 9: 97–99.
- Santesson, R. 1993a. The Lichens and Lichenicolous Fungi of Sweden and Norway. SBT-förlaget, Lund.
- Santesson, R. 1993b. *Stigmidium degelii*, a new lichenicolous fungus. *Graphis Scripta* 5: 3–4.
- Santesson, R. 1994a. Fungi Lichenicoli Exsiccati, Fasc. 7 & 8 (Nos 151–200). *Thunbergia* 6: 1–18.
- Santesson, R. 1994b. Fungi Lichenicoli Exsiccati, Fasc. 9 & 10 (Nos 201–250). *Thunbergia* 28: 1–24.
- Santesson, R. 1998. Fungi Lichenicoli Exsiccati, Fasc. 11 & 12 (Nos 251–300). *Thunbergia* 28: 1–19.
- Santesson, R. 2001. Fungi Lichenicoli Exsiccati, Fasc. 13 & 14 (Nos 301–350). *Thunbergia* 31: 1–18.
- Santesson, R. & T. Tønsberg. 1994. *Arthrorhaphis aeruginosa* and *A. olivaceae*, two new lichenicolous fungi. *Lichenologist* 26: 295–299.
- Santesson, R. R. Moberg A. Nordin, T. Tønsberg & O. Vitikainen. 2004. Lichen-forming and Lichenicolous Fungi of Fennoscandia. Museum of Evolution, Uppsala University, Uppsala, Sweden, 359 pp.
- Sarrión, F. J., J. Hafellner & A. R. Burgaz 2002. Three new species of the genus *Dactylospora* in Spain. *Lichenologist* 34: 361–368.
- Scheidegger, C. 1987. *Buellia uberior* und *B. miriquidica* (Physciaceae, Lecanorales), zwei lichenicole Krustenflechten auf *Schaeria tenebrosa*. *Botanica Helvetica* 97: 99–116.
- Scheidegger, C. 1993. A revision of European saxicolous species of the genus *Buellia* De Not. and formerly included genera. *Lichenologist* 25: 315–364.
- Scheidegger, C. & B. Rued. 1988. Die xanthonhaltigen, gesteinsbewohnenden Sippen der Flechtengattung *Buellia* De Not. (Physciaceae, Lecanorales) in Europa. *Nova Hedwigia* 47: 433–468.
- Schiefelbein, U., W. von Brackel, R. Cezanne, P. Czarnota, J. Eckstein, M. Eichler, H.-U. Kison, K. Ungethüm & R. Stordeur. 2017. *Trimmatostroma arctoparmeliae* sp. nov. and noteworthy records of lichenized, lichenicolous and allied fungi from the Harz Mountains and surrounding regions. *Herzogia* 30: 80–102.
- Scholz, P. 1998. *Phacopsis doerfeltii*, sp. nov., and two other interesting lichenicolous fungi from Canada. *Sauteria* 9: 37–42.
- Seavey, F. & J. Seavey. 2012. *Caloplaca lecanorae* (Teloschistaceae), a new lichenicolous lichen and several additions to the North American lichenized mycota from Everglades National Park. *The Bryologist* 115: 322–328.
- Seavey, F., J. Seavey, J. Gagnon, J. Guccion, B. Kaminsky, J. Pearson, A. Podaril & B. Randall. 2017. The lichens of Dagny Johnson Key Largo Hammock Botanical State Park, Key Largo, Florida, USA. *Bulletin of the Florida Museum of Natural History* 53: 201–268.
- Selva, S. B. 2013. The calicioid lichens and fungi of the Acadian Forest Ecoregion of northeastern North America, I. New species and range extensions. *The Bryologist* 116: 248–256.
- Sérusiaux, E. & P. Diederich. 2005. *Lambinonia*, a new genus for *Melanconium strigulae*, a lichenicolous hyphomycete on foliicolous species of *Strigula*. *Lichenologist* 37: 499–506.
- Sérusiaux, E. & D. Wessels. 1984. *Santessonia* (Lecanorales, Buelliaceae) in the Namib Desert (South West Africa). *Mycotaxon* 19: 479–502.
- Sérusiaux, E., P. Diederich, A. M. Brand & P. van den Boom. 1999. New or interesting lichens and lichenicolous fungi from Belgium and Luxembourg. VIII. *Lejeunia* n.s. 162: 1–95.
- Sérusiaux, E., P. Diederich, D. Ertz & P. van den Boom. 2003. New or interesting lichens and lichenicolous fungi from Belgium, Luxembourg and northern France. IX. *Lejeunia* n.s. 173: 1–48.
- Sherwood, M. A. 1977. The ostropalean fungi. *Mycotaxon* 5: 1–277.

- Sherwood-Pike, M. A. 1987. The ostropalean fungi III: The Odontotremataceae. *Mycotaxon* 28: 137–177.
- Sikaroodi, M., J. D. Lawrey, D. L. Hawksworth & P. T. DePriest. 2001. The phylogenetic position of selected lichenicolous fungi: *Hobsonia*, *Illosporium*, and *Marchandiomyces*. *Mycological Research* 105: 453–460.
- Singh, P., Y. Joshi & K. P. Singh. 2017. A new lichenicolous species of *Melaspilea* (Melaspileaceae, Arthoniales) from India. *Acta Botanica Hungarica* 59: 439–443.
- Søchting, U., D. O. Øvstedal & L. G. Sancho. 2004. The lichens of Hurd Peninsula, Livingston Island, South Shetlands, Antarctica. *Bibliotheca Lichenologica* 88: 607–658.
- Søchting, U., M. Z. Sogaard, J. A. Elix, U. Arup, A. Elvebakk & L. G. Sancho. 2014. *Catenarina* (Teloschistaceae, Ascomycota), a new Southern Hemisphere genus with 7-chlorocatenarin. *Lichenologist* 46: 175–187.
- Søchting, U., M. Z. Sogaard, L. G. Sancho, P. Frøden & U. Arup. 2016. *Sirenophila ovis-atra* a new species of maritime Teloschistaceae from the Southern Hemisphere. *Opuscula Philolichenum* 15: 1–5.
- Sparrius, L. B. 2004. A monograph of *Enterographa* and *Sclerophyton*. *Bibliotheca Lichenologica* 89: 1–141.
- Sparrius, L. B. & Aptroot, A. 2007. A new lichenicolous *Enterographa* species from Brittany (France). *Lichenologist* 39: 315–317.
- Spribile, T., S. Pérez-Ortega, T. Tønberg & D. Schirokauer. 2010. Lichens and lichenicolous fungi of the Klondike Gold Rush National Historic Park, Alaska, in a global biodiversity context. *The Bryologist* 113: 439–515.
- Spribile, T., V. Tuovinen, P. Resl, D. Vanderpool, H. Wolinski, M. C. Aime, K. Schneider, E. Stabentheiner, M. Toome-Heller, G. Thor, H. Mayrhofer, H. Johannesson & J. P. McCutcheon. 2016. Basidiomycete yeasts in the cortex of ascomycete macrolichens. *Science*: 10.1126/science.aaf8287.
- Suija, A. 2006. Variation of morphological characters in the lichenicolous ascomycete genus *Abrothallus*. *Annales Botanici Fennici* 43: 193–204.
- Suija, A. & V. Alstrup. 2004. *Buelliella lecanorae*, a new lichenicolous fungus. *Lichenologist* 36: 203–206.
- Suija, A. & J. Motiejūnaitė. 2017. *Calycina alstrupii* sp. nov. (Pezizellaceae, Helotiales), a new lichenicolous fungus from Norway. *Phytotaxa* 307: 113–122. Suija, A., S. Pérez-Ortega & D. L. Hawksworth. 2011. *Abrothallus halei* (Ascomycota, *incertae sedis*), a new lichenicolous fungus on *Lobaria* species in Europe and North America. *Lichenologist* 43: 51–55.
- Suija, A., A. de los Ríos & S. Pérez-Ortega. 2015a. A molecular reappraisal of *Abrothallus* species growing on lichens of the order Peltigerales. *Phytotaxa* 195: 201–226.
- Suija, A., D. Ertz, J. D. Lawrey & P. Diederich. 2015b. Multiple origin of the lichenicolous life habit in Helotiales, based on nuclear ribosomal sequences. *Fungal Diversity* 70: 55–72.
- Suija, A., P. van den Boom, E. Zimmermann, M. P. Zhurbenko & P. Diederich. 2018a. Lichenicolous species of *Hainesia* belong to Phacidiales (Leotiomyces) and are included in an extended concept of *Epithammolia*. *Mycologia* 109: 882–899.
- Suija, A., U. Kaasalainen, P. M. Kirika & J. Rikkinen. 2018b. *Taitaia*, a novel lichenicolous fungus in tropical montane forests in Kenya (East Africa). *The Lichenologist* 50: 173–184.
- Suija, A., A. Tsurykau, E. Zimmermann & P. Diederich. 2018 c. Molecular and morphological data suggest that the cladoniicolous *Pezizella ucrainica* belongs to *Hyphodiscus* (Hyaloscyphaceae, Helotiales). *Graphis Scripta* 30: 121–129.
- Sundin, R., G. Thor & A. Frisch. 2012. A literature review of *Arthonia* s. lat. *Bibliotheca Lichenologica* 108: 257–290.
- Suryanarayanan, T. S., G. N. Thirunavukkarasu, G. N. Hariharan & P. Balaji. 2005. Occurrence of non-obligate microfungi inside lichen thalli. *Sydowia* 57: 120–130.
- Sutton, B. C. 1980. The coelomycetes. Commonwealth Mycological Institute, Kew
- Thor, G. 1985. A new species of *Lichenostigma*, a lichenicolous ascomycete. *Lichenologist* 17: 269–272.
- Thorn, R. G., D. W. Malloch, & J. Ginns. 1998. *Leucogyrophana lichenicola* sp. nov., and a comparison with basidiomes and cultures of the similar *Leucogyrophana romellii*. *Canadian Journal of Botany* 76: 686–693.
- Tibell, L. 1971. The genus *Cyphelium* in Europe. *Svensk Botanisk Tidskrift* 65: 138–164.
- Tibell, L. 1978. The genus *Microcalicium*. *Botaniska Notiser* 131: 229–246.
- Tibell, L. 1991a. The *Asterophoma* anamorph of *Chaenothecopsis savonica* and its hyphomycetous synanamorph. *Canadian Journal of Botany* 69: 2427–2433.
- Tibell, L. 1991b. Revision of some taxa of Caliciales described by W. Nylander. *Annales Botanici Fennici* 28: 117–121.
- Tibell, L. 1998. Crustose mazaediate lichens and the Mycocaliciaceae in temperate South America. *Bibliotheca Lichenologica* 71: 1–107.
- Tibell, L. & K. Ryman 1995. Revision of species of *Chaenothecopsis* with short stalks. *Nova Hedwigia* 60: 199–218.
- Tibell, L., A. Frisch & G. Thor. 2014. Additions to the calicioid flora of Japan and Korea, with the descriptions of two new species. *Annales Botanici Fennici* 51: 189–194.
- Timdal, E. 1992. A monograph of the genus *Toninia* (Lecideaceae, Ascomycetes). *Opera Botanica* 110 [‘1991’]: 1–137.
- Titov, A. N. 2006. Mikokalitsievye griby (poryadok Mycocaliciales) golarkтики [Mycocalicioid fungi (the order Mycocaliciales) of the Holarctic]. KMK Scientific Press, Moscow, 295 pp. [Partial German and English translation in: R. Stordeur, U. Braun & N. Tkach. 2010. Titov: Mycocaliciale Pilze der Holarktis – Übersetzung der Bestimmungsschlüssel und Beschreibung neuer Arten. *Herzogia* 23: 19–67>.]
- Trakuningcharoen, T., L. Lombard, J. Z. Groenewald, R. Cheewangkoon, C. Toanun, A. C. Alfenas & P. W. Crous. 2014. Mycoparasitic species of *Sphaerellopsis*, and allied lichenicolous and other genera. *IMA Fungus* 5: 391–414.
- Tretiach, M. 2002. *Niesslia robusta*, a new lichenicolous fungus on *Tephromela grumosa* from Tuscany, Italy. *Nova Hedwigia* 75: 357–365
- Tretiach, M. P. Navarro-Rosinés. 1996. *Sarcopyrenia sigmoideospora* sp. nov., a lichenicolous ascomycete growing on *Verrucaria* gr. parmigera. *Nova Hedwigia* 62: 249–254.
- Tretiach, M. & P. L. Nimis. 1999. “*Pleospora*” *aquatica*, a new lichenicolous fungus on *Aspicilia supertegens* from Siberia. *Cryptogamie, Mycologie* 20: 283–289.
- Triebel, D. 1989. Lecideicole Ascomyceten. Eine Revision der obligat lichenicolen Ascomyceten auf lecideoiden Flechten. *Bibliotheca Lichenologica* 35: 1–278.
- Triebel, D. 1993. Notes on the genus *Sagediopsis* (Verrucariales, Adelococcaceae). *Sendtnera* 1: 273–280.
- Triebel, D. & G. Rambold. 1988. *Cecidonia* und *Phacopsis* (Lecanorales): zwei lichenicole Pilzgattungen mit cecidogenen Arten. *Nova Hedwigia* 47: 279–309.
- Triebel, D. & P. Scholz. 2001. Lichenicolous fungi from Bavaria as represented in the Botanische Staatssammlung München. *Sendtnera* 7: 211–231.

- Triebel, D., G. Rambold & T. H. Nash III. 1991. On lichenicolous fungi from continental North America. *Mycotaxon* 42: 263–296.
- Triebel, D., G. Rambold & J. A. Elix. 1995. A conspectus of the genus *Phacopsis* (Lecanorales). *The Bryologist* 98: 71–83.
- Triebel, D., M. Wedin & G. Rambold. 1997. The genus *Scutula* (lichenicolous ascomycetes, Lecanorales): species on the *Peltigera canina* and *P. horizontalis* groups. *Symbolae Botanicae Upsalienses* 32: 323–337.
- Tsurykau, A. & J. Etayo. 2017. *Capronia suiijae* (Herpotrichiellaceae, Eurotiomycetes), a new fungus on *Xanthoria parietina* from Belarus, with a key to the lichenicolous species growing on *Xanthoria* s.str. *Lichenologist* 49: 1–12.
- Untereiner, W. A., C. Gueidan, M.-J. Orr & P. Diederich. 2011. The phylogenetic position of the lichenicolous ascomycete *Capronia peltigerae*. *Fungal Diversity* 49: 225–233.
- U'Ren, J. M., F. Lutzoni, J. Miadlikowska & A. E. Arnold. 2010. Community analysis reveals close affinities between endophytic and endolichenic fungi in mosses and lichens. *Microbial Ecology* 60: 340–353.
- U'Ren, J. M., F. Lutzoni, J. Miadlikowska, A. D. Laetsch & A. E. Arnold. 2012. Host and geographic structure of endophytic and endolichenic fungi at a continental scale. *American Journal of Botany* 99: 898–914.
- U'Ren, J. M., J. M. Riddle, J. T. Monacell, I. Carbone, J. Miadlikowska & A. E. Arnold. 2014. Tissue storage and primer selection influence pyrosequencing-based inferences of diversity and community composition of endolichenic and endophytic fungi. *Molecular Ecology Resources* 14: 1032–1048.
- Vácz, P. & D. L. Hawksworth. 2001. *Polycoccum crespoae* sp. nov., the first report of a lichenicolous fungus on *Chondropsis semiviridis* (Parmeliaceae). *Lichenologist* 33: 513–517.
- Valadbeigi T. & W. von Brackel. 2011. Two new species of *Lichenostigma* (Lichenotheliaceae, lichenicolous fungi) from Iran. *Willdenowia* 41: 191–195.
- van den Boom, P. P. G. 2004. *Toninia*. In: T. H. Nash III, B. D. Ryan, P. Diederich, C. Gries & F. Bungartz (eds.): *Lichen Flora of the Greater Sonoran Desert Region*, Vol. 2. Lichens Unlimited, Arizona State University, Tempe, Arizona, pp. 708–709.
- van den Boom, P. P. G. 2009. New *Halecania* species (Catillariaceae) from Europe and South America. *The Bryologist* 112: 827–832.
- van den Boom, P. P. G. 2010. New or interesting lichens and lichenicolous fungi of Gran Canaria (Canary Islands, Spain). *Willdenowia* 40: 359–367.
- van den Boom, P. P. G. 2012. Additions and notes to the checklist of lichens and lichenicolous fungi of Cape Verde. *Österreichische Zeitschrift für Pilzkunde*. 21: 5–16.
- van den Boom, P. P. G. 2015. Lichens and lichenicolous fungi from graveyards of the area of Eindhoven (the Netherlands), with the description of two new species. *Annalen des Naturhistorischen Museums in Wien. Serie B, Botanik und Zoologie* 117: 245–276.
- van den Boom, P. P. G. 2016. Lichens and lichenicolous fungi of the Azores (Portugal), collected on São Miguel and Terceira with the descriptions of seven new species. *Acta Botanica Hungarica* 58: 199–222.
- van den Boom, P. P. G. & P. Clerc. 2017. Further new or interesting lichens and lichenicolous fungi from La Palma (Canary Islands, Spain). *Folia Cryptogamica Estonica* 54: 117–123.
- van den Boom, P. P. G. & J. A. Elix. 2005. Notes on *Halecania* species, with descriptions of two new species from Asia. *Lichenologist* 37: 237–246.
- van den Boom, P. & D. Ertz. 2012. Lichens and lichenicolous fungi from El Hierro (Canary Islands), a survey, including five new species. *Cryptogamie, Mycologie* 33: 59–97.
- van den Boom, P. P. G. & D. Ertz. 2014. A new species of *Micarea* (Pilocarpaceae) from Madeira growing on *Usnea*. *Lichenologist* 46: 295–301.
- van den Boom, P. P. G. & J. Etayo. 2001. Two new sorediate species of lichens in the Catillariaceae from the Iberian Peninsula. *Lichenologist* 33: 103–110.
- van den Boom, P. P. G. & J. Etayo. 2006. New records of lichens and lichenicolous fungi from Fuerteventura (Canary Islands), with descriptions of some new species. *Cryptogamie, Mycologie* 27: 341–374.
- van den Boom, P. & J. Etayo. 2014. New records of lichenicolous fungi and lichenicolous lichens from the Iberian Peninsula, with the description of four new species and one new genus. *Opuscula Philolichenum* 13: 44–79.
- van den Boom, P. P. G. & J. Etayo. 2017. Further interesting lichens and lichenicolous fungi from Fuerteventura, Canary Islands (Spain), with three new species and notes on *Mixtoconidium*. *Ascomycete.org*. 9: 124–134.
- van den Boom, P. P. G. & M. Giralt. 2012. Checklist and three new species of lichens and lichenicolous fungi of the Algarve (Portugal). *Sydowia* 64: 149–207.
- van den Boom, P. P. G. & M. Haji Moniri. 2018. Notes on the lichen genus *Lecania* (Ramalinaceae) in Iran, with the description of a new *Arthonia* species (Arthoniaceae). *Nova Hedwigia* (in press).
- van den Boom, P., E. Sérusiaux, P. Diederich, M. MBrand, A. Aptroot & L. Spier. 1998. A lichenological excursion in May 1997 near Han-sur-Lesse and Saint-Hubert, with notes on rare and critical taxa of the flora of Belgium and Luxembourg. *Lejeunia* n.s. 158: 1–58.
- van den Boom, P. P. G., H. J. M. Sipman, P. K. Divakar & D. Ertz. 2017. New or interesting records of lichens and lichenicolous fungi from Panama with descriptions of ten new species. *Sydowia* 69: 47–72.
- Van den Broeck, D. & D. Ertz. 2018. *Enterographa confusa* sp. nov. (Roccellaceae, Arthoniales) discovered by chance in type material of its host lichen *Arthonia ochraceella*, described more than a century ago. *Phytotaxa* 343: 89–93.
- Vězda, A. 1969. Beiträge zur Kenntnis der flechtenbewohnenden Pilze in der Tschechoslowakei. II. Zwei neue Arten: *Opegrapha rimodinae* sp. nov. und *Polycoccum galligenum* sp. nov. *Česká Mykologie* 23: 104–109.
- Vondrák, J. & J. Kocourková. 2008. New lichenicolous *Opegrapha* species on *Caloplaca* from Europe. *Lichenologist* 40: 171–184.
- Vondrák, J. & J. Šoun. 2007. *Lichenostigma svandae*, a new lichenicolous fungus on *Acarospora cervina*. *Lichenologist* 39: 211–216.
- Vouaux L. 1912–1914. Synopsis des champignons parasites de lichens. *Bulletin de la Société mycologique de France* 28 (1912): 177–256; 29 (1913): 33–128, 399–494; 30 (1914): 135–198, 281–329.
- Wang, Y., Y. Zheng, X. Wang, X. Wei & J. Wei. 2016. Lichen-associated fungal community in *Hypogymnia hypotrypa* (Parmeliaceae, Ascomycota) affected by geographic distribution and altitude. *Frontiers in Microbiology* 7: 1231.
- Wedin, M. 1994. New and noteworthy lichenicolous fungi from southernmost South America. *Lichenologist* 26: 301–310.
- Wedin, M. & J. Hafellner. 1998. Lichenicolous species of *Arthonia* on Lobariaceae with notes on excluded taxa. *Lichenologist* 30: 59–91.

- Wedin, M. & S. Y. Kondratyuk. 1997. *Dactylospora plectocarpoides*, a gall-forming species of *Arthonia* on *Pseudocyphellaria*. *Lichenologist* 29: 97–99.
- Wedin, M., P. G. Ihlen & D. Triebel. 2007. *Scutula tuberculosa*, the correct name of the *Scutula* growing on *Solorina* spp., with a key to *Scutula* s.str. in the Northern Hemisphere. *Lichenologist* 39: 329–333.
- Werth, S., A. M. Millanes, M. Wedin & C. Scheidegger. 2013. Lichenicolous fungi show population subdivision by host species but do not share population history with their hosts. *Fungal Biology* 117: 71–84.
- Wetmore, C. M. 1999. Four new species of *Caloplaca* from Mexico. *The Bryologist* 102: 99–103.
- Wijayawardene, N. N., K. D. Hyde, K. C. Rajeshkumar, D. L. Hawksworth, H. Madrid, P. M. Kirk, U. Braun, R. V. Singh, P. W. Crous, M. Kukwa, R. Lücking, C. P. Kurtzman, A. Yurkov, D. Haelewaters, A. Aptroot, H. T. Lumbsch, E. Tindal, D. Ertz, J. Etayo, A. J. L. Phillips, J. Z. Groenewald, M. Papizadeh, L. Selbmann, M. C. Dayaratne, G. Weerakoon, E. B. Gareth Jones, S. Suetrong, Q. Tian, R. F. Castañeda-Ruiz, A. H. Bahkali, K.-L. Pang, K. Tanaka, D. Qin Dai, J. Sakayaroj, M. Hujšlová, L. Lombard, B. D. Shenoy, A. Suija, S. S. N. Maharachchikumbura, K. M. Thambugala, D. N. Wanasinghe, B. O. Sharma, S. Gaikwad, G. Pandit, L. Zucconi, S. Onofri, E. Egidi, H. A. Raja, R. Kodsueb, M. E. S. Cáceres, S. Pérez Ortega, P. O. Fiuza, J. Santana Monteiro, L. N. Vasilyeva, R. G. Shivas, M. Prieto, M. Wedin, I. Olariaga, A. Azeez Lateef, Y. Agrawal, S. A. Shahzadeh Fazeli, M. A. Amoozegar, G. Zhu Zhao, W. P. Pfliegler, G. Sharma, M. Oset, M. A. Abdel-Wahab, S. Takamatsu, K. Bensch, N. I. de Silva, A. De Kesel, A. Karunarathna, S. Boonmee, D. H. Pfister, Y.-Z. Lu, Z.-L. Luo, N. Boonyuen, D. A. Daranagama, I. C. Senanayake, S. C. Jayasiri, M. C. Samarakoon, X.-Y. Zeng, M. Doilom, L. Quijada, S. Rampadarath, G. Heredia, A. J. Dissanayake, R. S. Jayawardana, R. H. Perera, L. Z. Tang, C. Phukhamsakda, M. Hernández-Restrepo, X. Ma, S. Tibpromma, L. F. P. Gusmao, D. Weerahewa, S. C. Karunarathna. 2017. Notes for genera: Ascomycota. *Fungal Diversity* 86: 1–594.
- Yeshitela, K., Fischer, E., Killmann, D. & Sérusiaux, E. 2009. Two new foliicolous species of *Enterographa* (Roccellaceae) from Kenya. *Lichenologist* 41: 17–23.
- Zamora, J. C., S. Pérez-Ortega & V. J. Rico. 2011. *Tremella macrobasidiata* (Basidiomycota, Tremellales), a new lichenicolous fungus from the Iberian Peninsula. *Lichenologist* 43: 407–415.
- Zamora, J. C., S. Pérez-Ortega & V. J. Rico. 2014. *Heteroacanthella ellipsozona* sp. nov., the first lichenicolous basidiomycete with acanthoid basidia. *Lichenologist* 46: 17–23.
- Zamora, J. C., A. M. Millanes, M. Wedin, V. J. Rico & S. Pérez-Ortega. 2016. Understanding lichenicolous heterobasidiomycetes: new taxa and reproductive innovations in *Tremella* s.l. *Mycologia* 108: 381–396.
- Zamora, J. C., P. Diederich, A. M. Millanes & M. Wedin. 2017. An old familiar face: *Tremella anaptychia* sp. nov. (Tremellales, Basidiomycota). *Phytotaxa* 307: 254–262.
- Zehetleitner, G. 1978. Über einige parasitische Arten der Flechtengattung *Verrucaria*. *Nova Hedwigia* 29: 683–734.
- Zhang, T., X.-L. Wei, Y.-Q. Zhang, H.-Y. Liu & L.-Y. Yu. 2015. Diversity and distribution of lichen-associated fungi in the Ny-Ålesund Region (Svalbard, High Arctic) as revealed by 454 pyrosequencing. *Scientific Reports* 5: 14850.
- Zhao, X., S. D. Leavitt, Z. T. Zhao, L. L. Zhang, U. Arup, M. Grube, S. Pérez-Ortega, C. Printzen, L. Sliwa, E. Kraichak, P. K. Divakar, A. Crespo & H. T. Lumbsch. 2016. Towards a revised generic classification of lecanoroid lichens (Lecanoraceae, Ascomycota) based on molecular, morphological and chemical evidence. *Fungal Diversity* 78: 293–304.
- Zhuang, W.-Y. 2000. Two new species of *Unguiculariopsis* (Helotiales, Encoelioidae) from China. *Mycological Research* 104: 507–509.
- Zhurbenko, M. P. 2002. *Arthonia triebeliae* (Arthoniales), a new lichenicolous fungus from the Arctic. *Mycological Progress* 1: 137–141.
- Zhurbenko, M. P. 2007a. A new species of *Unguiculariopsis* (Helotiales) on *Nephroma* from Alaska. *Mycology and Phytopathology [St. Petersburg]* 41(2): 126–129.
- Zhurbenko, M. 2007b. New lichenicolous fungi from Eurasia. *Graphis Scripta* 19: 1–9.
- Zhurbenko, M. 2007c. *Corticifraga santessonii* and *C. chugachiana* (Lecanoromycetes, Ascomycota), new species of lichenicolous fungi from the Holarctic. *Lichenologist* 39: 221–226.
- Zhurbenko, M. P. 2008a. Lichenicolous fungi from Russia, mainly from its Arctic. II. *Mycologia Balcanica* 5: 13–22.
- Zhurbenko, M. P. 2008b. *Lichenochora thorii* (Phyllachorales), a new lichenicolous ascomycete from Europe. *Nova Hedwigia* 87: 509–512.
- Zhurbenko, M. P. 2009a. Lichenicolous fungi and some lichens from the Holarctic. *Opuscula Philolichenum* 6: 87–120.
- Zhurbenko, M. P. 2009b. Lichenicolous fungi and lichens from the Holarctic. Part II. *Opuscula Philolichenum* 7: 121–186.
- Zhurbenko, M. 2009c. *Sagediopsis pertusariicola* (Verrucariales), a new lichenicolous ascomycete from the Arctic. *Nova Hedwigia* 88: 549–555.
- Zhurbenko, P. M. 2009d. New and interesting lichenicolous hypocrealean fungi from the Northern Hemisphere. *Sydowia* 61: 177–188.
- Zhurbenko, M. P. 2010a. Lichenicolous fungi and lichens growing on *Stereocaulon* from the Holarctic, with a key to the known species. *Opuscula Philolichenum* 8: 9–39.
- Zhurbenko, M. 2010b. New and interesting lichenicolous fungi from Eurasia. II. *Mycosphere* 1: 213–222.
- Zhurbenko, M. P. 2012. Lichenicolous fungi growing on *Thamnolia*, mainly from the Holarctic, with a worldwide key to the known species. *Lichenologist* 44: 147–177.
- Zhurbenko, M. P. 2013a. Lichenicolous fungi and some allied lichens from the Canadian Arctic. *Opuscula Philolichenum* 12: 180–197.
- Zhurbenko, M. P. 2013b. *Hainesia peltigerae* sp. nov. and some other interesting lichenicolous fungi from Eurasia. *Graphis Scripta* 25: 39–43.
- Zhurbenko, M. 2014. *Phaeospora catolechia*, a lichenicolous fungus on *Catolechia wahlenbergii*, new to North America. *Opuscula Philolichenum* 13: 1–3.
- Zhurbenko, M. P. 2015. *Sphaerellothecium siphulae* (Dothideomycetes incertae sedis), a new lichenicolous fungus on *Siphula ceratites* from the Arctic. *Nova Hedwigia* 101: 419–425.
- Zhurbenko, M. 2017. Lichenicolous fungi of the Caucasus: new species, new records and a second synopsis. *Opuscula Philolichenum* 16: 267–311.
- Zhurbenko, M. P. & V. Alstrup. 2004. Lichenicolous fungi on *Cladonia* mainly from the Arctic. *Symbolae Botanicae Upsalienses* 34: 477–499.
- Zhurbenko, M. P. & W. von Brackel. 2013. Checklist of lichenicolous fungi and lichenicolous lichens of Svalbard, including new species, new records and revisions. *Herzogia* 26: 323–359.

- Zhurbenko, M. P. & U. Braun. 2012. *Cecidiomyces*, a new subantarctic lichenicolous hyphomycete genus. *Lichenologist* 44: 801–806.
- Zhurbenko, M. P. & U. Braun. 2013. *Ameroconium cladoniae* gen. et sp. nov. and *Phoma psoromatis* sp. nov., new anamorphic lichenicolous fungi from the Holarctic. *Lichenologist* 45: 583–591.
- Zhurbenko, M. P. & P. Diederich. 2008. *Stigmidium cladoniicola*, a new lichenicolous fungus from Northern Ural, Russia. *Graphis Scripta* 20: 13–18.
- Zhurbenko, M. & K. L. Dillman. 2010. *Polycoccum hymeniicola* comb. nov. (Dacampiaceae) and other interesting lichenicolous fungi from southeastern Alaska. *The Bryologist* 113: 260–266.
- Zhurbenko, M. P. & J. Etayo. 2012. *Stigmidium lobariae*, a new lichenicolous fungus from the Holarctic. *Mycosphere* 3: 62–64.
- Zhurbenko, M. P. & J. Etayo. 2013. *Biazrovia*, a new genus of lichenicolous ascomycetes from Asia. *Mycobiota* 1: 51–56.
- Zhurbenko, M. P. & M. Grube. 2010. *Arthonia pannariae* (Arthoniaceae, Arthoniales), a new lichenicolous fungus from northern Holarctic. *Graphis Scripta* 22: 47–51.
- Zhurbenko, M. P. & J. J. Hafellner. 1999. Lichenicolous fungi from the Putorana plateau, Siberian Subarctic. *Folia Cryptogamica Estonica* 34: 71–79.
- Zhurbenko, M. & A. Notov. 2015. The lichenicolous lichen *Placocarpus americanus* and some noteworthy lichenicolous fungi from Russia. *Folia Cryptogamica Estonica* 52: 95–99.
- Zhurbenko, M. P. & Y. Ohmura. 2018. *Perigrapta cetrariae*, a new lichenicolous ascomycete on *Cetraria* from Japan. *Folia Cryptogamica Estonica* 55: 17–19.
- Zhurbenko, M. P. & V. Otte. 2012. lichenicolous fungi from the Caucasus: new records and a first synopsis. *Herzogia* 25: 235–244.
- Zhurbenko, M. P. & R. Pino-Bodas. 2015. New lichenicolous fungi growing on *Cladia* in New Zealand. *The Lichenologist* 47: 395–402.
- Zhurbenko, M. P. & R. Pino-Bodas. 2017. A revision of lichenicolous fungi growing on *Cladonia*, mainly from the Northern Hemisphere, with a worldwide key to the known species. *Opuscula Philolichenum* 16: 188–266.
- Zhurbenko, M. & D. Triebel. 2003. *Cercidospora lecidomae* (Dothideales, Ascomycetes), a new lichenicolous fungus from the North Holarctic. *Bibliotheca Lichenologica* 86: 205–214.
- Zhurbenko, M. & D. Triebel. 2005. *Lasiophaeriopsis pilophori* sp. nov. (Sordariales) and other lichenicolous fungi on *Pilophorus*. *Mycological Progress* 4: 317–323.
- Zhurbenko, M. & D. Triebel. 2008. Three new species of *Stigmidium* and *Sphaerellothecium* (lichenicolous ascomycetes) on *Stereocaulon*. *Mycological Progress* 7: 137–145.
- Zhurbenko, M. P. & S. E. Vershinina. 2014. *Opegrapha bryoriae* sp. nov. and other lichenicolous fungi from Asian Russia. *Herzogia* 27: 93–109.
- Zhurbenko, M. P. & L. S. Yakovchenko. 2014. A new species, *Sagediopsis vasilyevae*, and other lichenicolous fungi from Zabaikal'skii Territory of Russia, southern Siberia. *Folia Cryptogamica Estonica* 51: 121–130.
- Zhurbenko, M. P. & I. S. Zhdanov. 2013. *Melaspilea galligena* sp. nov. and some other lichenicolous fungi from Russia. *Folia Cryptogamica Estonica* 50: 89–99.
- Zhurbenko, M. P., R. Santesson, D. A. Walker, N. A. Auerbach & B. Lewis. 1995. New and interesting lichenicolous fungi and lichens from Alaska. *Evansia* 12: 92–97.
- Zhurbenko, M. P., G. A. Laursen & D. A. Walker. 2005. New and rare lichenicolous fungi and lichens from the North American Arctic. *Mycotaxon* 92: 201–212.
- Zhurbenko, M., P. Diederich & T. Otnyukova. 2008. *Plectocarpon hypogymniae* (Roccellaceae), a new lichenicolous species from Siberia. *The Bryologist* 111: 328–330.
- Zhurbenko, M. P., M. Kukwa & M. Oset. 2009. *Roselliniella stereocaulorum* (Sordariales, Ascomycota), a new lichenicolous fungus from the Holarctic. *Mycotaxon* 109: 323–328.
- Zhurbenko, M. P., D. E. Himelbrant, E. S. Kuznetsova & I. Stepanchikova. 2012. Lichenicolous fungi from the Kamchatka Peninsula, Russia. *The Bryologist* 115: 295–312.
- Zhurbenko, M. P., A. Frisch, Y. Ohmura & G. Thor. 2015a. Lichenicolous fungi from Japan and Korea: new species, new records and a first synopsis for Japan. *Herzogia* 28: 762–789.
- Zhurbenko, M. P., J. Etayo, K. Fedrowitz & G. Thor. 2015b. Miscellaneous reports of lichenicolous fungi from Argentina including the new species *Didymellopsis nephromatis*. *Opuscula Philolichenum* 14: 82–89.
- Zhurbenko, M. P., B. Heuchert & U. Braun. 2015c. *Talpapellis solorinae* sp. nov. and an updated key to the species of *Talpapellis* and *Verrucocladosporium*. *Phytotaxa* 234: 191–194.
- Zhurbenko, M. P., U. Braun, B. Heuchert & A. A. Kobzeva. 2015d. New lichenicolous hyphomycetes from Eurasia. *Herzogia* 28: 584–598.
- Zhurbenko, M. P., J. Etayo, A. N. Demidova & I. S. Zhdanov. 2016. *Capronia josephafellneri* sp. nov. (Ascomycota, Herpotrichiellaceae) and some other lichenicolous fungi from Vietnam. *Herzogia* 29: 364–373.
- Zhurbenko M. P., A. K. Ezhkin, I. F. Skirina & Y. Ohmura. 2017. *Dactylospora anziae*, a new lichenicolous ascomycete on *Anzia* from East Asia. *Folia Cryptog. Estonica* 54: 13–16.
- Zhurbenko M. P., K. Tadome & Y. Ohmura. 2018. *Pronectria japonica* sp. nov. and a key to the lichenicolous fungi and lichens growing on *Ochrolechia*. *Herzogia* 31 (in press).
- Zimmermann, E. & F. Berger. 2018. Beitrag zur lichenicolen Mycobiota Österreichs – Funde aus den Tiroler Alpen I. *Herzogia* 31 (in press).
- Zopf, F. W. 1896. Uebersicht der auf Flechten schmarotzenden Pilze. *Hedwigia* 35: 312–366.

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Supplementary document online:

Supplementary Table S1. Summary statistics for all taxa listed in the 2018 classification and checklist of lichenicolous fungi in spreadsheet format.