The genera of Hyphomycetes – 2011 update

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Abstract This supplement to the taxonomic monograph The Genera of Hyphomycetes summarises information on 23 accepted new genera and c. 160 species described in 2011. These include three dematiaceous genera (Funbolia, Noosia, Pyrioneum, all related to Dothideomycetes), a bulbil-producing genus, Spiroplana (Pleosporales), and two endophytic genera, the sterile Periglandula (Clavicipitaceae), and the hyaline, sympodial Micronematobotrys (Pyronemataceae). Slow-growing, morphologically-reduced, darkly pigmented fungi continue to be the source of new taxa, including the new genus Abramixia (Dothioraceae). Eight new genera of darkly pigmented chlamydospore-like anamorphs were described from marine or subtidal environments (Glomerulurisula, Halozon, Hiopiospora, Megasporum, Mohietospora, Moleospora, Moromyces), mostly associated with subclades of the Lulworthiales. Several genera that are morphologically similar to but phylogenetically distinct from genera of the Capnodiales (Pseudopassalora, Scleroramularia) were introduced, as well as segregates from the classical concepts of Alternaria (Sinomyces), Chalara and Phialophora (Brachyalara, Infundichalara, Lasidaphia), and Paecilomyces (Purpureocillium for the former Paecilomyces ilicinus complex). In addition, in anticipation of the new nomenclatural rules, newly configured formerly-teleomorph genera were proposed as segregates from classical hyphomycete genera in the Hypocreales, namely, Acromonium (Cosmospora), Fusarium (Cyanonectria, Dialonectria, Geojayessia, Macroconia, Stylenectria), and Volutella (Pseudonectria) and the Trichocomaceae, Eurotiales, Penicillium (Talaromyces for the former Penicillium subg. Biverticillium). Standardized generic mini-diagnoses are provided for the accepted new genera, along with details of distribution, substrates, numbers of new species and phylogenetic affinities within the Dikarya. GenBank accession numbers for ITS DNA-barcodes are provided where available. New information on generic concepts of previously recognised genera, phylogenetic relationships, and corrections of factual errors are also included. Only two newly described genera, Fecundostilbum and Utrechtiana, seem to be synonyms of previously described genera.

INTRODUCTION

In April 2011, our book ‘The Genera of Hyphomycetes’ was published (Seifert et al. 2011). This was the first comprehensive overview of hyphomycete genera in more than 30 years, providing bibliographic data, illustrations, standardised generic diagnoses, synonyms, distribution and substrate information, teleomorph and synanamorph connections, and DNA barcode designations for more than 1400 accepted genera. This paper provides updates to the ‘Dictionary’ section of this book, covering information published in the approximately 12 mo since the text was completed.

Changes to what will now be called the International Code of Nomenclature of Algae, Fungi and Plants will have a dramatic effect on the names used for hyphomycetes. The Article 59 debate, which had been brewing in various forms since the publication of ‘The Whole Fungus’ (Kendrick 1979, see also Seifert 2003) led to conflicting opinions among mycologists (Hawksworth et al. 2011, Gams et al. 2011). In August 2011, the International Botanical Congress voted for significant changes on the rules for fungal nomenclature (see Hawksworth 2011, Norvell 2011). The final Melbourne Code has not yet been published, and in this update we have just made minor alterations to our approach to naming hyphomycete genera, reflecting only changes already proposed in the cited literature. We will await the final wording, and the results of discussions at conferences during 2012, before implementing major changes to the Dictionary as a whole.

These changes to nomenclature notwithstanding, 2011 was a relatively typical year in hyphomycete taxonomy. Twenty-five new genera were described, 23 of them accepted here. This is a similar rate to the period between 1980 and 2010, which saw the description of about 600 new genera. Several patterns are worth noting. Plant endophytes (Sun & Guo 2010, Steiner et al. 2011), and slow-growing, darkly pigmented fungi from arid substrates such as rocks and tree bark (Tsuneda et al. 2011), continue to be a source of new fungal biodiversity. Some of these fungi are essentially sterile or have very reduced sporulating micromorphology, but the provision of formal names is justified by their phylogenetic distinctiveness. Phylogenetic interpretation of chlamydospore-like morphs of marine and subtidal fungi led to the description of eight new, and the redefinition of three previously existing hyphomycete genera (Abdel-Wahab et al. 2010): it remains to be seen whether these genera will be useful in a single-name taxonomic system. The reconsideration of large, economically important genera in the Dothideomycetes (anamorphs similar to but phylogenetically distinct from those of Capnodiales, Crous et al. 2011), Nectriaceae (Fusarium, Gräfenhan et al. 2011, Schroers et al. 2011), Pleosporaceae (Alternaria complex, Wang et al. 2011), Trichocomaceae (Paeclomyces, Luangsa-arnd et al. 2011; Penicillium, Samson et al. 2011), and morphologically reduced, phialidic hyphomycetes (Chalara and Phialophora sensu lato, Réblová & Gams 2011), resulted in the recognition of either new or redefined and resurrected genera.

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Of particular note in 2011, the continued epidemic of the North American bat Myotis lucifugus caused by the hyphomycete Geomyces destructans (Lorch et al. 2011) causes increasingly concern about the potential extinction of this animal host. The number of Aspergillus species known to produce the regulated mycotoxin aflatoxin (Varga et al. 2011) continues to increase. The continued importance of hyphomycetes as agents of plant disease, and diseases of humans, is illustrated by many new discoveries presented in the bibliography below.

We are pleased to note that the descriptions of virtually all new or newly segregated genera considered here were accompanied by supporting molecular phylogenetic data, generally ITS (internal transcribed spacer) barcodes or LSU (large subunit) sequences. New data for only four previously described genera, originally described without molecular data, were provided to allow these taxa to be placed in their phylogenetic context. We expect that this activity will accelerate with the official designation of the ITS as the fungal barcode (Schoch & Seifert 2011), which we hope will stimulate mycologists to recognise the value of publishing such data. Unfortunately, about 30 % of new species were described without molecular data of any kind; this seems to be a particularly serious problem in studies of dematiaceous hyphomycetes. We encourage hyphomycetologists to routinely include at least ITS barcodes in the description of new species. Even if no molecular context exists for some of these genera, the framework can be built on one species at a time by the community of hyphomycete taxonomists, to the benefit of all.

This, and future, updates to ‘The Genera of Hyphomycetes’ will also appear on the website www.generaofhyphomycetes.org.

THE UPDATE

The format of entries, abbreviations and conventions are explained by Seifert et al. (2011). The meanings of most of the abbreviations are self-evident, but the definitions of some warrant repetition here:

CDM: conidioma type, generally none, sporodochium or synnematum.

SET: setae accompanying conidiomata or conidiophores.

CPH: conidiophores.

CGC: conidigenous cells.

CDA: conidia, in this update presented as amero (aseptate), didymo (1-septate), phragmo (transversely septate), dicyto (muriiform), or bulbils.

The new anamorphs and B-anamorphs are described for genera with morphologically distinct synanamorphs.

Acromonium Link 1809 : Fr.

Refs. Gräfenhan et al., Stud. Mycol. 68: 79–113. 2011 (revis. as Cosmospora, multigene). — Summerbell et al., Stud. Mycol. 68: 139–162. 2011 (revis., LSU, SSU). — Kiyuna et al., Mycosen 52: 1–17. 2011 (n. sp., n. comb., would go to Pseudogliomastix but belonging to Plectosphaerellaceae, rDNA).

Acrodictys M.B. Ellis 1971

Ref. G.Z. Zhao et al., Mycol. Progr. 10: 67–83. 2011 (n. sp., spp. from China).

Alternaria Nees 1816 : Fr.

Refs. Gannibal, Mycotoxicon 114: 109–114. 2011; ‘2010’ (n. spp.). — Tóth et al., Mycologia 103: 94–100. 2011 (n. sp.). — Taralova et al., Fungal Biol. 115: 1163–1173. 2011 (modelling of conidiation apparatus).

Arthrobotrys Corda 1839

Ref. X.M. Niu & K.Q. Zhang, Mycology (China) 2: 59–78. 2011 (review A. oligospora).

Aspergillus Micheli ex Link 1809 : Fr.

Refs. Horn et al., Mycologia 103: 174–183. 2011 (teleomorph A. no-mius). — Varga et al., Stud. Mycol. 69: 1–18. 2011 (revis., n. spp., sect. Nigri, multigene). — Meijer et al., Stud. Mycol. 69: 19–30. 2011 (physiol. sect. Nigri). — Battaglia et al., Stud. Mycol. 69: 31–38. 2011 (physiol. sect. Nigri). — Samson et al., Stud. Mycol. 69: 39–56. 2011 (n. spp., sect. Terrei, multigene). — Varga et al., Stud. Mycol. 69: 57–80. 2011 (revis., n. spp., sect. Flavi, multigene). — Samson et al., Stud. Mycol. 69: 81–97. 2011 (n. spp., sect. Ustr, multigene). — Perrone et al., Fungal Biol. 115: 1136–1150. 2011 (sect. Nigri, multigene, A. awamori).

Atramixtia Tsuneda, M.L. Davey & Currah 2011 — Botany 89: 328 (323–336, fig. 1–25) / A. arboricola Tsuneda, M.L. Davey & Currah 2011

CDM: sporodochium- or sclerotium-like, dark. SET: none. CPH = CGC: sporangium-like, endoconidia, dark brown. CDA: amero, hyaline, yeast-like. B-anamorph: CGC: monoblastic, brown. CDA: amero or didymo, hyaline, yeast-like.

On branches (Picea): North America. One species. ITS barcode: HM347778.

Notes — Anamorphic Ascomycota (Dothideales). Compare with Endoconidionoma, Hormonema, Phaeotheca, Phaeothecoidaea and other so-called meristematic genera. Probably not distinct from Hormonema.

Aureosbasidium Viala & G. Boyer 1891

Ref. Crous et al., Persoonia 27: 20–45. 2011 (n. sp., n. comb., rDNA).

Bagadiella Cheew. & Crous 2009

Ref. Crous et al., Persoonia 26: 124–127. 2011 (n. sp., rDNA).

Beauveria Vuill. 1912

Ref. Rehner et al., Mycologia 103: 1055–1073. 2011 (revis., n. spp., multigene).

Brachyhalara Réblová & W. Gams 2011 — Fung. Diversity 46: 72 (72–75, fig. 3–16) / B. straminea Réblová & W. Gams 2011

CDM: none. SET: none. CPH: unbranched or sparingly branched, pale brown. CGC: (poly)phialides, pale brown. CDA: amero, hyaline, basipetal chains, schizo, dry.

On fungi (Bulgaria): Europe. One species. LSU: HQ609475.

Notes — Anamorphic Ascomycota (Leotiomyces). Compare with Exochalara, Chalara s.lat.

Calonectria De Not. 1867 — Comment. Soc. Crittog. Ital. 2 (no. 3): 477 (no illus.) / C. dalldiniana De Not. 1867 = Calonectria pyrochroa (Desm.) Sacc. 1878 = Cylindrocladium Morgan 1892, fide Lombard et al. 2010

Notes — Anamorphic and/or teleomorphic Ascomycota (Nectriaceae, Hypocreales). For other references to this genus, see under Cylindrocladium in our book.

Refs. Lombard et al., Stud. Mycol. 66: 1–71. 2010 (n. spp., teleomorphs, key, multigene). — S.F. Chen et al., Persoonia 26: 1–12. 2011 (n. spp., teleomorphs).
**Buxus** Samuels & Chaverri 2009 — Mycol. Progr. 

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**Catenuilera** Hosoya 2002

Ref. Hosoya et al., Mycol. Progr. 10: 239–248. 2011 (n. sp. as Hyphodiscus, rDNA).

**Catenulostroma** Crous & U. Braun 2007

Refs. Crous & Groenewald, Persoonia 26: 70–84. 2011 (n. sp., rDNA). — Crous & Carnegie, Persoonia 26: 148–149. 2011 (n. sp., rDNA).

**Ceratoocladium** Corda 1839

Ref. Mena et al., Mycol. Progr. 10: 493–496. 2011 (n. sp., n. comb., key).

**Cercospora** Fresen. 1863

Refs. Nakashima et al., Mycoscience 52: 253–259. 2011 (illus.). — Montenegro-Calderón et al., Fungal Biol. 115: 1151–1162. 2011 (multigene, C. rodoni). — Shivai & Young, Persoonia 26: 110–111. 2011 (n. sp., rDNA).

**Chaetendophragmia** Matsush. 1971

Ref. Chen & Tzean, Taiwania 54: 152–158. 2009 (record).

**Chaleara** (Corda) Rabenh. 1844

Ref. Koukol, Fung. Diversity 49: 75–91. 2011 (n. spp., multigene).

**Chlamydopsis** Hol.-Jech. & R.F. Castañeda 1986

On decaying leaves (*Caesalpinia, Syzygium*): Caribbean, South America.

Ref. Silva & Grandi, Mycotaxon 114: 43–47. 2011, ‘2010’ (emend.).

**Chloridium** Link 1809: Fr.

Ref. Rébélová et al., Fung. Diversity 46: 67–86. 2011 (n. comb., rDNA).

**Cirrenalia** Meyers & R.T. Moore 1960

Ref. Abdel-Wahab et al., Mycol. Progr. 9: 537–558. 2010 (n. spp.).

**Cladophialophora** Borelli 1980

Ref. Badali et al., Fungal Biol. 115: 1019–1029. 2011 (n. sp., multigene).

**Cladorrhinum** Sacc. & Marchal 1885

Refs. Park & Shin, Mycotaxon 116: 449–456. 2011 (n. sp., fungicolous). — Madrid et al., Mycologia 103: 795–805. 2011 (n. spp., LSU).

**Cladosporum** Link 1815: Fr.

Refs. Crous & Groenewald, Persoonia 26: 70–84. 2011 (n. sp., rDNA). — Crous et al., IMA Fungus 2, 1: 49–64. 2011 (n. spp., LSU).

**Corynesporopsis** P.M. Kirk 1981

Refs. Castañeda et al., Mycotaxon 114: 407–415. 2011, ‘2010’ (n. sp., key). — J. Ma et al., Mycotaxon 114: 423–426. 2011, ‘2010’ (records).

**Cosmospora** Rabenh. 1862 — Hedwigia 2: 59 (tab. X II, figs. 1–5) / C. coccinea Rabenh. 1862

CDM: none. SET: none. CPH: unbranched or sparingly branched, (verticillate), hyaline. CGC: phialides, hyaline. CDA: amero, hyaline, slimy or in basipetal chains, schizo.

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On fungi (*Hypoxylon* and other *Xylariaceae, Inonotus, Stereum*) on wood, and in soil, butter: Europe, North and South America. Seven or more species. ITS barcode: HQ897827 (CBS 341.70).

Notes — Anamorphic and/or teleomorphic *Ascomycota* (*Nectriaceae, Hypocreales*). Compare with *Acremonium* and its segregates. This genus was redefined in a narrow sense by Gräfenhan et al. (2011) for some species formerly included in *Acremonium*.

Refs. (mostly as *Acremonium*): Gams, Cephalosporium-artige Schimmelpilze, 262 pp. 1971 (monogr., key, as *Acremonium*). — Gams & van Zaayen, Neth. J. Pl. Path. 88: 57–78. 1982 (as *Nectriopsis*). — Samuels et al., Hypocreales of the SE United States, p. 109. 2006 (illus.). — Gräfenhan et al., Stud. Mycol. 68: 79–113. 2011 (revis., n. combs, multigene). — Summerbell et al., Stud. Mycol. 68: 139–162. 2011 (revis., n. combs, LSU, SSU).

**Cumulospora** I. Schmidt 1985

Refs. Abdel-Wahab et al., Mycol. Progr. 9: 537–558. 2010 (revis., key to similar genera).

**Cyanonecctria** Samuels & Chaverri 2009 — Mycol. Progr. 8: 56 (49–58, fig. 2) / C. cyanostoma (Sacc. & Flagolet) Samuels & Chaverri 2009 = *Nectria cyanostoma* Sacc. & Flagolet 1902

CDM: sporodochia, pale. SET: none. CPH: branched or verticillate, hyaline. CGC: phialides, hyaline. CDA: phragmo, hyaline, falcate (with foot-shaped basal cell), slimy, schizo. OTHER: (chlamydospores).

On twigs and leaves (*Buxus*): Europe. Two species. ITS barcode: FJ474076 (CBS 101734).

Notes — Anamorphic and/or teleomorphic *Ascomycota* (*Nectriaceae, Hypocreales*). Compare with *Dialonectria, Fusarium, Fusicolla, Geejayessia, Macroconia, Microcera, Stylonectria*.

Ref. Schroers et al., Stud. Mycol. 68: 115–138. 2011 (revis., n. sp., n. combs, multigene).

**Cylindrocladium** Morgan 1892

≡ *Calonectria* De Not. 1867, fide Lombard et al. 2010.

**Dactylelya** Grove 1884

Refs. Y.D. Zhang et al., Mycotaxon 114: 259–261. 2011, ‘2010’ (n. sp., misclassified). — H. Su et al., Cryptog. Mycol. 32: 177–183. 2011 (n. sp., ITS).

**Dendroclathria** Voglmayr & Delg.-Rodr. 2001 / D. caeruleofusca Voglmayr & Delg.-Rodr. 2001 = *D. lignicola* (Abdullah, Gené & Guarro) Voglmayr 2011

Caribbean, Europe. ITS barcode: EU873531.

Notes — Anamorphic *Ascomycota* (*Microascales*).

Ref. Voglmayr, Mycotaxon 116: 191–202. 2011 (n. comb., multigene).

**Devriesia** Seifert & N.L. Nick. 2004

Refs. Crous & Groenewald, Persoonia 26: 70–84. 2011 (n. sp., rDNA). — Crous et al., Persoonia 26: 140–141. 2011 (n. sp., rDNA).

**Dialonectria** (Sacc.) Cooke 1884 — Grevillea 12: 82 (109–111, no illus.) / *D. episphaeria* (Tode) Cooke, 1884 = *Sphaeria episphaeria* Tode 1791

CDM: sporodochia, pale. SET: none. CPH: branched or verticillate, hyaline. CGC: phialides, hyaline. CDA: phragmo, hyaline,
falcate (with foot-shaped basal cell), slimy, schizo. OTHER: amero microconidia.

On fungi (ascomycete stromata) on angiosperms: Europe, North America. Two or more species. ITS barcode: HQ897811 (CBS 125494).

Notes — Anamorphic and/or teleomorphic Ascomycota (Nectriaeae, Hypocreales). Compare with Cyanoconetria, Dialonectria, Fusicolla, Geomyces, Macroconia, Microcera, and Sphaeriaceae. This genus was redefined in a narrow sense by Gräfenhan et al. (2011) for some species formerly included in either Nectria subg. Dialonecia, the Nectria episphaeria group, or Cosmospora and their fusarium-like anamorphs.

Ref. (mostly as Fusarium or Cosmospora): Wollenweber & Reinking, Die Fusarien, Paul Parey, Berlin. 1935 (monogr., in German). — Gerlach & Nirenberg, Mitt. Biol. Bundesanst. LD-u. Forstw. 209: 1–406. 1982 (pictorial atlas). — Samuels et al., Mycol. Pap. 164: 1–48. 1991 (revis. as Nectria subgen. Dialonecia). — Samuels et al., Hypocreales of the SE United States, p. 103. 2006 (illus.). — Gräfenhan et al., Stud. Mycol. 68: 79–113. 2011 (revis., n. sp., multigene).

**DICTYOSPORIUM** Corda 1836

Ref. White et al., Persoonia 26: 154–155. 2011 (n. sp., rDNA).

**Drechslera** S. Ito 1950

Ref. Crous et al., Persoonia 27: 20–45. 2011 (n. sp. as Pyrenomorph, multigene).

**Ellisembia** Subram. 1992

Ref. J. Ma et al., Mycotaxon 114: 417–421. 2011, ’2010’ (n. spp.).

**Exochalara** W. Gams & Hol.-Jech. 1976

Ref. Rébélová et al., Fung. Diversity 46: 67–86. 2011 (rDNA).

**Exophiala** J.W. Carmich. 1966

Refs. Crous & Groenewald, Persoonia 26: 70–84. 2011 (n. sp., synanamorph: Cladocephaloria rDNA). — W. Wang, Persoonia 26: 112–113. 2011 (n. sp., rDNA). — D.M. Li et al., Med. Mycol. 47. sp. issue: 101–109. 2009 (n. sp., rDNA). — Seyedmousavi et al., Fungal Biol. 115: 1030–1037. 2011 (n. sp., multigene). — Machouart et al., Fungal Biol. 115: 1038–1050. 2011 (rDNA introns).

**Fecundostilbum** D. Pramella & P.N. Chowdry 2009 — Indian Fung. Diversity 46: 64 (64–68, fig. 1–17) / F. saccharum D. Pramella & P.N. Chowdry. 2009

≡ *Leptoxypheg* Speg. 1918, fide Seifert based on protologue.

**Fonseceae** Negroni 1936

*Synanamorphs.* Cladocephaloria, chlamydospores, fide Najafzadeh et al. 2011.

Ref. Najafzadeh et al., Fungal Biol. 115: 1066–1076. 2011 (n. sp., multigene).

**Fraseriella** Cif. & A.M. Corte 1957

Notes — Anamorphic Ascomycota (*Onygenales*).

Ref. Peterssen et al., Fungal Biol. 115: 1100–1111. 2011 (rDNA, physiol., as Xeromyces).

**Funbolia** Crous & Seifert 2011 — Persoonia 26: 115 (114–115, illus.) / F. dimorpha Crous & Seifert 2011

CDM: none. SET: none. CPH: unbranched or sparingly branched, brown. CGC: papillate, pseudosclars, brown. CDA: dimorphic, amero or phragmo, brown, single, dry, schizo.

On bark (angiosperm): North America. One species. ITS barcode: JR951136.

Notes — Anamorphic *Ascomycota* (*Dothideomycetes*). Compare with *Catenulisubulispora*, *Endophragmiella*, *Spadiceoides*, *Thysanorea*.

**Fusarium** Link 1809 : Fr.

Notes — The studies by Gräfenhan et al. (2011) and Schroers (2011) removed several phylogenetically disparate groups from *Fusarium*, resulting in the recognition of *Atractium*, *Cyanoconetria*, *Dialonectria*, *Fusicolla*, *Geomyces*, *Macroconia*, *Microcera*, and *Stylonectria* as distinct genera.

Refs. D. O’Donnell et al., J. Clin. Microbiol. 46: 2477–2490. 2008 (F. solani complex, multigene). — D. O’Donnell et al., J. Clin. Microbiol. 48: 3708–3718. 2010 (multigene ID database, human and animal infections). — Balmas et al., Mycologia 102: 803–812. 2010 (ssp. in Sardinia). — Summerell et al., Fung. Diversity 46: 1–27. 2011 (ssp. in Australia). — Gräfenhan et al., Stud. Mycol. 68: 79–113. 2011 (revis., generic concepts). — Schroers et al., Stud. Mycol. 68: 115–138. 2011 (revis., generic concepts). — Holtz et al., Canad. J. Plant Pathol. 33: 61–76. 2011 (multigene variation within *F. avenaceum*). — M.H. Li et al., Canad. J. Plant Pathol. 33: 168–178. 2011 (AFLP *F. oxysporum*). — van Hove et al., Mycologia 103: 570–585. 2011 (n. sp., teleomorphic, multigene). — Elmer & Marr, Mycologia 103: 806–819. 2011 (n. sp., multigene). — Laurence et al., Fun. Diversity 49: 101–112. 2011 (n. sp., multigene).

**Fusicladium** Bonord. 1851

Ref. Crous et al., Persoonia 27: 20–45. 2011 (n. sp., rDNA).

**Fusicolla** Bonord. 1851

CDM: sporodochia, pale. SET: none. CPH: branched or penicillate, hyaline. CGC: phialides (or polyphialides), hyaline. CDA: phragmo, hyaline, falcate (with foot-shaped basal cell), slimy, schizo. OTHER: (amero microconidia), (chlamydospores).

Notes — Compare with *Cyanoconetria*, *Dialonectria*, *Fusarium*, *Geomyces*, *Macroconia*, *Microcera*, and *Stylonectria*.

**Geomyces** Schroers, Gräfenhan & Seifert 2011 — Stud. Mycol. 68: 124 (124–133, fig. 5, 6) / G. *catricicum* (Berk.) Schroers 2011 = *Sphaeria sanguinea* var. *catricicum* Berk. 1837

CDM: sporodochia, pale. SET: none. CPH: branched or verticillate, hyaline. CGC: phialides, hyaline. CDA: phragmo, hyaline, falcate (with foot-shaped basal cell), slimy, schizo.

On twigs and leaves (*Buxus*, *Celtis*, *Hoheria*, *Staphylea*): Australasia, Europe, North America. Five species. ITS barcode: HM626655 (CBS 125740).

Notes — Anamorphic and/or teleomorphic Ascomycota (*Nectriaeae*, *Hypocreales*). Compare with *Cyanoconetria*, *Dialonectria*, *Fusarium*, *Fusicolla*, *Macroconia*, *Microcera*, and *Stylonectria*.

**Geosmithia** Traaen 1914

Notes — White-nose syndrome of bats in North America is caused by *G. destructans*.

Ref. Lindner et al., Mycologia 103: 241–246. 2011 (ITS, bat pathogen).

**Geosmithia** J. Pitt 1979

Ref. Kolařík et al., Mycologia 103: 325–332. 2011 (n. sp., ITS).
Glarea Bills & Pelaez 1999

On leaf litter, in soil and pond water: Europe, North and South America.

Notes — Anamorphic Ascomycota (Helotiales, Helotiales).
Ref. Pelaez et al., Mycologia (China) 2: 1–17. 2011 (multigene, metabolites).

Gliomastix Guég. 1905

Notes — Formerly considered a synonym of Acremonium, phylogenetic analysis suggest the distinctiveness of this genus. Only a small part of Acremonium sect. Gliomastix sensu Gams (1971) is formally recognized here so far.
Ref. Summerbell et al., Stud. Mycol. 68: 139–162. 2011 (revis., n. comb., LSU, SSU).

Glomerulospira Abdel-Wahab & Nagah. 2011 — Mycol. Progr. 9: 553 (553–554, fig. 12) / G. mangrovis Abdel-Wahab, Abdel-Aziz & Nagah. 2011

CDM: none. SET: none. CPH: ?unbranched, hyaline or pale brown, or = cgc. CGC: monoblastic or solitary thalic, hyaline or pale brown. CDA: dicyto or bulbils, brown, single, dry, schizo.
On wood in intertidal water: Asia. One species. LSU: GU252149.

Notes — Anamorphic Ascomycota (Hypocreales, TBM clade). Compare with Cumulospora, Halenospora, Moleospora, Moromyces, Zalerion.

Graphium Corda 1837

Ref. Lackner & de Hoog, IMA Fungus 2, 1: 39–48. 2011 (revis. G. putreadinis complex in Parascosporium, ITS).

Halazoön Abdel-Aziz, Abdel-Wahab & Nagah. 2011 — Mycol. Progr. 9: 545 (545–547, fig. 5) / H. melhae Abdel-Aziz, Abdel-Wahab & Nagah. 2011

CDM: none. SET: none. CPH = CGC: monoblastic or solitary thallic, brown. CDA: phialides with funnel-shaped collarettes, (pale) brown. On wood in intertidal water (Phragmites): Europe, Middle East. Two species (one invalid Art. 33.4). LSU: GU252143.

Notes — Anamorphic Ascomycota (Lulworthiales). Compare with Cirrenalia, Hydea, Matsusporium, Zalerion.

Hansfordia S. Hughes 1951

Ref. X.L. Cheng et al., Mycotaxon 116: 431–436. 2011 (n. sp).

Heliocépha V. Rao, K.A. Reddy & de Hoog 1984

= Holubovaniella R.F. Castañeda 1985, fide Heredia et al. 2011

Notes — Anamorphic Ascomycota (Dothideomycetes, Microptelidaceae).
Ref. Heredia et al., Mycologia 103: 631–640. 2011 (n. sp., key, LSU).

Heteroconium Petr. 1949

Ref. Y.D. Zhang et al., Mycotaxon 114: 315–318. 2011, ‘2010’ (n. sp.).

Hiogispora Abdel-Wahab & Nagah. 2011 — Mycol. Progr. 9: 555 (555–557, no illus.) / H. japonica (Sugiy.) Abdel-Wahab & Nagah. 2011 = Cirrenalia japonica Sugiy. 1981

CDM: none or fasciculate. SET: none. CPH: unbranched or sparingly branched, pale brown, CGC: monoblastic or solitary thalic, hyaline or pale brown. CDA: dicyto, brown, single, dry, schizo.
On bark (Abies): Asia. One species. LSU: GU252139.

Notes — Anamorphic Ascomycota (Pleosporales). Compare with Cumulospora, Halenospora, Moromyces, Zalerion.
Ref. Sugiyama, Trans. Mycol. Soc. Japan 22: 47–53. 1981 (n. sp., as Cirrenalia).

Hirsutella Pat. 1892

Refs. J.Y. Chen et al., Mycotaxon 115: 1–4. 2011 (teleomorph: Ophiocordycipes n. sp.). — Luangsa-ard et al., Fungal Biol. 115: 608–614. 2011 (teleomorph: Ophiocordycipes n. sp., multigene).

Holubovaniella R.F. Castañeda 1985

≡ Heliocépha V. Rao, K.A. Reddy & de Hoog 1984, fide Heredia et al. 2011

Hydea K.L. Pang & E.B.G. Jones 2011 — Mycol. Progr. 9: 549 (549–550, fig. 6) / H. pygmea (Kohlm.) K.L. Pang & E.B.G. Jones 2011 = Cirrenalia pygmea Kohlm. 1966

CDM: none. SET: none. CPH = CGC: monoblastic or solitary thalic, brown. CDA: helico, brown, single, dry, schizo.
On wood in intertidal water (Rhizophora): Pantropical. One species. LSU: GU252133.

Notes — Anamorphic Ascomycota (Lulworthiales). Compare with Cirrenalia, Halazoön, Helicosingula, Slimacomyces, Troposporaella.
Ref. Kohlmeyer, Ber. Deutsch. Bot. Ges. 79: 27–37. 1966 (n. sp., as Cirrenalia).

Hymenostilbe Petch 1931

Ref. Luangsa-ard et al., Fungal Biol. 115: 608–614. 2011 (multigene).

Hyphopolynema Nag Raj 1977

Ref. Pinho et al., Mycotaxon 114: 55–59. 2011, ‘2010’ (n. sp.).

Infundichalaria Réblová & W. Gams 2011 — Fung. Diversity 46: 78 (78–80, fig. 42–48) / I. microchona (W. Gams) Réblová & W. Gams 2011 = Chalara microchona W. Gams 1976, Stud. Mycol. 13: 73. 1976

CDM: none. SET: none. CPH: unbranched or sparingly branched, pale brown, or = cgc. CGC: phialides with funnel-shaped collarettes, (pale) brown. CDA: amero, hyaline, basipetal chains, schizo, dry.
On fungi (Fomitopsis), wood (Abies, Larix, Picea, Pinus) and in soil: Europe, North America. One species. LSU: HQ609479.

Notes — Anamorphic Ascomycota (Leotiomyces). Compare with Brachyalara, Exochalara, Chalara sensu lato.

† The citation of the basionym in the protologue erroneously gave the wrong volume number; this does not affect the validity of the genus or the species name according to Art. 33.5. The correct data for the basionym is given here.
Knufia L.J. Hutchison & Unter. 1996

CDM: sporodochia, dark. CDA: acropetal chains.

Notes — Anamorphic Ascomycota (Herpotrichiellaceae, Chaetothyriales).

Refs. Tsuneda & Currah, Rep. Tottori Mycol. Inst. 42: 1–9. 2004 (n. sp.) — Tsuneda et al., Botany 114: 55–59. 2011, ‘2010’ (n. sp., invalid n. combs.).

Koorchaloma Subram. 1953

Ref. Allegrucci et al., Mycocalix 115: 175–181. 2011 (n. sp., key).

Kylindria DiCosmo, S.M. Berch & W.B. Kendr. 1983

Ref. Y.D. Zhang et al., Mycocalix 114: 367–371. 2011 (n. sp., perhaps to be classified in Monilochaetes).

Lasioderma Mont. 1845 — Ann. Sci. Nat., Bot. sér. 3, 4: 364 (illus. by Durieu & Montagne 1846) / L. flavovirens Durieu & Mont. 1845

≡ Talaromycy C.R. Benj. 1955, nom. cons. prop., fide Llimona (pers. comm. to KAS)

Notes — Described as a hyphomycete genus by Montagne, but regarded a basidiomycete by von Höhnel (1910), and subgen. Lasiadelphia, Lecythophora, Phialophora and its segregate genera.

Lasiadelphia Rébélová & W. Gams 2011 — Fung. Diversity 46: 82 (82–83, fig. 79) / L. lasiosphaeraiæ (W. Gams) Rébélová & W. Gams 2011 = Phialophora lasiosphaeraiæ W. Gams 1976 = Lasiadelphia anamorph of Lasiosphaeris hispida (Tode : Fr.) Clem. 1909

CDM: none. SET: none. CPH: unbranched or sparingly branched, hyaline or pale brown, or = cgc. CGC: (poly)phialides, pale brown. CDA: andro, hyaline, basipetal chains, schizo, dry.

On wood: Europe, North America. One species. ITS barcode: GU252141.

Notes — Anamorphic Ascomycota (Sordariales). Compare with Catenulifera, Lecythophora, Phialophora and its segregate genera.

Leptographium Lagerb. & Melin 1928

Ref. Jacobs et al., Mycol. Progr. 9: 69–78. 2010 (n. sp., multigene).

Leptophyllum Specg. 1918

≡ Fecundostilbum D. Pramella & P.N. Chowdry 2009, fide Seifert based on the protologue

Ref. Crous & Shivas, Persoonia 26: 144–145. 2011 (n. sp., rDNA).

Lomaantha Subram. 1954

Ref. J. Ma et al., Mycologia 103: 407–410. 2011 (n. sp., key).

Macroconia (Wollenw.) Gräfenhan, Seifert & Schroers 2011 — Stud. Mycol. 68: 101 (101–103, no illus.) / M. leptosphaeraiæ (Niessl) Gräfenhan & Schroers 2011 = Nectria leptosphaeraiæ Niessl 1886

≡ Nectria sect. Macroconia Wollenw., Angew. Bot. 8: 179. 1926

CDM: sporodochia, pale. SET: none. CPH: branched or verticillate, hyaline, CGC: phialides, hyaline. CDA: phragmo, hyaline, falcate (with foot-shaped basal cell), slimy, schizo. OTHER: (amero microconidia), (chlamydospores).

On fungi (ascomycete stromata, Leptosphaerium) on angiosperms or herbaceous plants: Asia, Europe, North America. Five species. ITS barcode: HQ897810 (CBS 100001).

Notes — Anamorphic and/or teleomorphic Ascomycota (Nectriaceae, Hypocreales). Compare with Cyanonectria, Dialonectria, Fusarium, Fusicolla, Geeljaysasia, Macroconia, Microcera, Stylenectria. This genus was erected by Gräfenhan et al. (2011) for some species formerly included in Cosmorpha and their fusarium-like anamorphs.

Refs. (mostly as Fusarium or Cosmorpha): Wollenweber & Reinking, Die Fusarien, Paul Parey, Berlin. 1935 (monogr., in German). — Gerlach & Nirenberg, Mitt. Biol. Bundesanst. Ld-u. Forstw. 209: 1–406. 1982 (pictorial atlas). — Samuels et al., Mycol. Pap. 164: 1–48. 1991 (revis. as Nectria subgen. Dialonectria). — Samuels et al., Hypocreales of the SE United States, p. 106. 2006 (illus.). — J. Luo & W.Y. Zhuang, Fung. Diversity 31: 83–93. 2008 (n. sp.). — Gräfenhan et al., Stud. Mycol. 68: 79–113. 2011 (revis., n. combs, multigene).

Marchandiomycies Diederich & D. Hawksw. 1990

Ref. Diederich et al., Mycologia 103: 525–533. 2011 (multigene, illus.).

Mariannaea G. Arnaud ex Samson 1974

Ref. Gräfenhan et al., Stud. Mycol. 68: 79–113. 2011 (n. sp., multigene).

Matsusporium E.B.G. Jones & K.L. Pang 2011 — Mycol. Progr. 9: 550 (fig. 9) / M. tropicales (Kohlm.) E.B.G. Jones & K.L. Pang 2011 = Cirrenalia tropicales Kohlm. 1968

CDM: none. SET: none. CPH: ?unbranched, pale brown, or = cgc. CGC: monoblastic or solitary thallic, brown. CDA: helico, dark brown, single, dry, schizo.

On wood in intertidal water: Pantropical. One species. LSU: GU252141.

Notes — Anamorphic Ascomycota (Lulworthiales). Compare with Cirrenalia, Halenospora, Helicosingula, Hydea, Slimacomyces, Troposporella.

Ref. Kohlmeyer, Mycolgia 60: 252–270. 1968 (n. sp., as Cirrenalia).

Megacapitula J.L. Chen & Tzean 1993

ITS barcode: JN128686 (GUFC 15515).

Notes — Anamorphic Ascomycota (Pleosporales).

Ref. Prabhugaonkar & Bhat, Mycosphere 2: 463–467. 2011 (ITS).

Microcera Desm. 1848

CDM: pale sporodochia or determinate synnemata. SET: none. CPH: branched, verticillate or penicillate, hyaline. CGC: phialides, hyaline. DCA: didymo or phragmo, hyaline, falcate (with foot-shaped basal cell), slimy, schizo.

On scale insects (Chrysomphalus, Eulecanium, Quadraspidiotus, Unaspis), insect larvae, soil or plant debris: Cosmopolitan. Four species.

Notes — Compare with Cyanonectria, Dialonectria, Fusarium, Geeljaysasia, Macroconia, Microcera, Stylenectria. The generic concept suggested in our book included the species segregated here into Dialonectria, Fusicolla, Macroconia and Stylenectria, and thus was much broader than eventually published by Gräfenhan et al. (2011); and the narrowed morphological and ecological concept is outlined here.
**Monilochaetes** Halst. 1890

*Ref.* Réélová et al., Fung. Diversity 46: 67–86. 2011 (n. sp., rDNA).

**Moromyces** Abdel-Wahab, K.L. Pang, Nagah., Abdel-Aziz & E.B.G. Jones 2011 — Mycol. Progr. 9: 555–556, fig. 14 / *M. varius* (Chatmala & Somrith.) Abdel-Wahab, K.L. Pang, Nagah., Abdel-Aziz & E.B.G. Jones 2011 = *Cumulospora* varia Chatmala & Somrith. 2004

CDM: none. SET: none. CPH = CGC: monoblastic or solitary thallic, hyaline or pale brown. CDA: dictyo or bulbils, brown, single, dry, schizo.

On wood in intertidal water: Asia. One species.

LSU: EU848578.

Notes — Anamorphic *Ascomycota* (*Lulworthiales*). Compare with *Cumulospora*, *Glomerulispora*, *Halenospora*, *Moleospora*, *Moromyces*, *Zalerion*.

**Muscodora** Worapong, Strobel & W.M. Hess 2001

*Ref.* Suwannarach et al., Mycotaxon 114: 15–23. 2011, ‘2010’ (n. sp., ITS).

**Myceliophthora** Costantin 1894

*Ref.* van der Brink et al., Fung. Diversity 2011 (multigene, AFLP, n. combs.).

**Neosporidesmium** Mercado & J. Mena 1988

*Refs.* J. Ma et al., Mycol. Progr. 10: 257–262. 2011 (n. spp., key). — Y.D. Zhuang et al., Mycotaxon 114: 125–130. 2011 (n. sp., tabular key).

**Neotyphodium** Glenn, C.W. Bacon & Hanlin 1996

*Ref.* Ghimire et al., Mycol. Progr. 10: 257–262. 2011 (interspp. hybrid).

**Noosia** Crous, R.G. Shivais & McTaggart 2011 — Persoonia 26: 139 (138–139, illus.) / *N. banksiae* Crous, R.G. Shivais & McTaggart 2011

CDM: none. SET: none. CPH = CGC: monoblastic or sympodial, short denticles, brown. CDA: dimorphic, amero or phragmo, brown, single, dry, schizo.

On leaves (*Bankzia*): Australasia. One species. ITS barcode: JR951147.

Notes — Anamorphic *Ascomycota* (*Pleosporales*). Compare with *Catenulisubulispora*, *Endophragmiella*, *Spadicoides*, *Thysanorea*.

**Oidium** Link 1824

*Refs.* Desprez-Loustau et al., Mycoscience 52: 165–173. 2011 (ITS, as *Erysiphe*). — Seko et al., Mycoscience 52: 174–182. 2011 (ITS, as *Erysiphe*). — Braun, Mycoscience 52: 210–212. 2011 (review, as *Erysiphe*).

**Paecilomyces** Bainier 1907

*Ref.* M. Chen et al., Mycotaxon 114: 25–32. 2011, ‘2010’ (n. sp.). — J. He et al., Mycotaxon 115: 303–310. 2011 (n. sp., multigene).

**Paradendryphiopsis** M.B. Ellis 1976

*Ref.* Silvera-Simón et al., Mycotaxon 114: 473–479. 2011, ‘2010’ (n. sp., key).


**Paradictyoarthritis** Matsush. 1996

ITS barcode: JN128869 (GUFCC 15514).

Notes — Anamorphic Ascomycota (Pleosporales).

*Ref.* Prabhugaonkar & Bhat, Mycosphere 2: 463–467. 2011 (ITS).

**Parascedosporium** Gilgado, Gené, Cano & Guarro 2007

*Ref.* Lackner & de Hoog, IMA Fungus 2, 1: 39–48. 2011 (revis., n. comb., ITS).

**Passalora** Fr. 1849

*Refs.* Nakashima et al., Mycoscience 52: 253–259. 2011 (illus.). — Koike et al., IMA Fungus 2, 1: 7–15. 2011 (illus.). — F.Y. Zhai et al., Mycotaxon 116: 447–448. 2011 (n. comb.). — Crous et al., Persoonia 26: 130–131. 2011 (n. sp., rDNA).

**Penicillium** Link 1809 : Fr.

= *Eupenicillium* F. Ludw. 1892, fide Houbraken & Samson 2011

Notes — The long expected segregation of the former *Penicillium* subg. *Biverticillium*, recognizable by its symmetrical biverticillate conidiophores and lanceolate phialides, into a distinct genus was implemented by Samson et al. (2011), who transferred the accepted species to *Talaromyces*.

*Refs.* Houbraken et al., Fungal Diversity 44: 117–133. 2010 (revis.). — F.Y. Zhai et al., Mycotaxon 116: 401–405. 2011, ‘2010’ (n. sp.). — Y.D. Zhang et al., Mycotaxon 114: 465–480. 2011 (multigene, complex, n. spp., multigene). — Barreto et al., Fungal Diversity 49: 23–33. 2011 (n. sp., *P. glabrum* complex). — Houbraken et al., IMA Fungus 2, 2: 121–125. 2011 (n. sp.). — Nonaka et al., Mycoscience 52: 338–343. 2011 (n. sp.). — Houbraken & Samson, Stud. Mycol. 70: 1–51. 2011 (phylogenetic revision). — Houbraken et al., Stud. Mycol. 70: 53–138. 2011 (revis. sect. *Citrina*, multigene). — Rivera & Seifert, Stud. Mycol. 70: 139–158. 2011 (*P. sclerotiorum* complex, n. sp., multigene). — Samson et al., Stud. Mycol. 70: 159–184. 2011 (segregation of *Talaromyces*).

**Penidiella** Crous & U. Braun 2007

*Ref.* Crous & Groenewald, Persoonia 26: 70–84. 2011 (n. sp., rDNA).

**Periglandula** U. Steiner, E. Leistner & Leuchtm. 2011 — Mycologia 103: 1137 (1133–1145, fig. 1–3) / Hypocreales

Notes — Anamorphic Ascomycota (Clavicipitaceae, Hypocreales). A sterile sister group to *Balansia*.

**Pesotum** J.L. Crane & Schohn. 1973

*Ref.* Grobbelaar et al., Mycoscience 52: 111–118. 2011 (multigene).

**Phaeodactylum** Agninoth. 1968

*Ref.* Y.D. Zhuang et al., Sydowia 63: 125–130. 2011 (n. sp., tabular key).

**Phialophora** Medlar 1915

*Ref.* Y.-M. Wu & T.-Y. Zhang, Mycotaxon 115: 251–254. 2011 (n. sp., probably misclassified).

**Podosporium** Schw. 1832

*Ref.* Y.D. Zhang et al., Mycotaxon 114: 401–405. 2011, ‘2010’ (n. sp.).

**Polythriniciopsis** J. Walker 1966 — Austral. J. Bot. 14: 195 (195–200, fig. 1–6, pl. 1) / *P. phragmitis* J. Walker 1966

CDM: none or clustered cph. SET: none. CPH: unbranched, hyaline or pale brown, or = cgc. CGC: symprobial, refractive scars, hyaline or pale brown. CDA: didymo (phragmo), hyaline or pale brown, single, dry, schizo.

On reeds (*Phragmites*): Australasia. One species.

Notes — Compare with *Fusicladium, Neoramarula, Pseudodidymaria, Polythrinicium*. The genus was considered a synonym of *Polythrinicium* by Seifert et al. (2011) following earlier opinions, but upon reconsideration, this synonymy seems unlikely.

**Pseudoacrodictys** W.A. Baker & Morgan-Jones 2003

*Refs.* G.Z. Zhao et al., Mycol. Progr. 10: 67–83. 2011 (spp. from China). — Y.D. Zhang et al., Mycol. Progr. 10: 261–265. 2011 (n. sp., key).

**Pseudocercospora** Speg. 1910

*Ref.* Nakashima et al., Mycoscience 52: 253–259. 2011 (n. comb.). — Crous & R.G. Shivis, Persoonia 26: 120–121. 2011 (n. sp., rDNA). — Phengsintham et al., Mycosphere 1: 205–212. 2010 (n. sp.).

**Pseudonectria** Seaver 1909 — Mycologia 1: 48 (48–49, no illus.) / *P. rousseliana* (Mont.) Wollenw. 1931 = *Nectria rousseliana* Mont. 1851 = *P. buxi* (DC.) Seifert, Gräfenhahn & Schroers 2011

CDM: sporodochia or determinate synnemata, pale. SET: hyaline, unbranched, on cdm. CPH: branched or penicillate, hyaline. CGC: phialides, hyaline. CDA: amero, hyaline, slimy, schizo.

On leaves and twigs (*Buxus*): Europe, North America. One species.

Notes — Anamorphic and/or teleomorphic *Ascomycota* (*Nectriaceae, Hypocreales*). Compare with *Volutella*.

*Refs.* (mostly as *Volutella*): Bezerra, Acta Bot. Neerl. 12: 58–63. 1963 (teleomorph). — Rossman et al., Mycologia 85: 685–704. 1993 (teleomorph). — Rossman et al., Stud. Mycol. 42: 161–164. 1999 (revis. teleomorphs). — Gräfenhahn et al., Mycol. Progr. 10: 79–113. 2011 (revis., n. combs, multigene).

**Pseudopassalora** Crous 2011 — Persoonia 27: 41 (41–42, fig. 23) / *P. gouriqua* Crous 2011

CDM: none. SET: none. CPH unbranched, hyaline, or = cgc. CGC: mono- or polyblastic, hyaline. CDA: amero, brown, single, dry, schizo.

On leaves (*Protea*): Africa. One species. LSU: JN712565.

Notes — Anamorphic Ascomycota (*Pleosporales*). Compare with *Agrabejja, Fusicladium, Passalora, Xiphomyces*.

**Pseudospirotes** M.B. Ellis 1971

*Ref.* Jian Ma et al., Nova Hedwigia 93: 465–473. 2011 (n. sp., key).

**Pseudovirgaria** H.D. Shin, U. Braun, Arzanlou & Crous 2007

*Ref.* Braun et al., IMA Fungus 2, 1: 65–69. 2011 (n. comb., ITS).

**Purpureocillium** Luangs-aard, Hywel-Jones, Houbraken & Samson 2011 — FEBS Microbiol. Lett. 321: 144 (131–149, fig. 3) / *P. lilacinum* (Thom) Luangs-aard, Houbraken, Hywel-Jones & Samson 2011 = *Penicillium lilacinum* Thom 1910

≡ *Paecilium* Luangs-aard, Hywel-Jones & Samson (listed in Domsch et al. 2007), nom. nud.
CDM: none. SET: none. CPH: verticillate or penicillate, hyaline. CGC: phialides, hyaline. CDA: amero, hyaline, in basipetal chains, dry, schizo.

In soil, on animals (humans, nematodes, insects) and other substrates: Cosmopolitan. One named species. ITS barcode: AY624189.

Notes — Anamorphic Ascomycota (Ophiocordycipitaceae, Hypocreales). Compare with Nomuraea, Paecilomyces.

Ref. (all as Paecilomyces illiacinus): Samson, Stud. Mycol. 6: 1–119. 1974 (monogr.). — Bissett, Fungi Canadenses, no. 156. 1979 (illus.). — de Hoog & Guarro, Atlas clin. Fungi, pp. 576–577. 1995; 2nd ed., pp. 794–809. 2001 (medically important spp.). — Tigano-Milani et al., Microbiology 141: 239–245. 1995 (tRNA fingerprinting). — Inglis & Tigano, Genet. Mol. Biol. 29: 132–136. 2006 (ITS). — Atkins et al., FEMS Ecol. 51: 257–264. 2006 (real-time PCR). — Domsch et al., Compendium of Soil Fungi, 2nd ed., pp. 322–323. 2007 (docum.; as Paecilium). — Sung et al., Stud. Mycol. 57: 1–63. 2007 (multigene).

**Pyricularia** Sacc. 1880

Ref. McKenzie et al., Mycosphere 1: 223–228. 2010 (n. sp., ITS).

**Pyriculariopsis** M.B. Ellis 1971

Ref. Soares et al., Mycol. Progr. 10: 315–321. 2011 (n. sp.).

**Pyrigermula** D. Magyar & R. Shoemaker 2011 — Mycol. Progr. 10: 309 (307–314, fig. 2–4) / *P. aurantiaca* D. Magyar & R. Shoemaker 2011

CDM: none. SET: none. CPH unbranched, hyaline, or = cgc. CGC: mono, pore, brown. CDA: phragmo, disto, brown, single, dry, schizo.

On branches (*Acer, Betula, Elaeagnus, Fagus, Vitis*) and plant exudates: Europe. One species. ITS barcode: HM241692.

Notes — Anamorphic Ascomycota (Chaetosphaeriaceae, Chaetosphaeriales). Compare with Bactrodesmiastrium, Janetia, Murogenella, Phragmospathula.

**Rachicladosporium** Crous, U. Braun & C.F. Hill 2007

Ref. Crous & Quaedvlieg, Persoonia 26: 132–133. 2011 (n. sp., rDNA).

**Racodium** Fr. 1829 : Fr.

Ref. Hawksworth et al., IMA Fungus 2, 1: 71–79. 2011 (nomenclature).

**Ramichloridium** Stahel 1937 ex de Hoog 1977

Ref. Shivas et al., Australas. Pl. Pathol. 40: 61–65. 2011 (n. sp.).

**Ramularia** Unger 1833

Refs. Crous et al., Persoonia 27: 20–45. 2011 (n. spp., rDNA). — Koike et al., IMA Fungus 2, 1: 7–15. 2011 (illus.).

**Repetophragma** Subram. 1992

Ref. Silvera-Simón et al., Anales Jard. Bot. Madrid 66 S1: 33–39. 2009 (n. sp., key). — Castañeda et al., Mycosphere 2, 3: 273–289. 2011 (n. sp., n. comb., key).

**Rhexoacridictys** W.A. Baker & Morgan-Jones 2011

Ref. G.Z. Zhao et al., Mycol. Progr. 10: 67–83. 2011 (spp. from China).

**Sarcinella** Sacc. 1877

Ref. Hosagoudar, Plant Pathol. Quarant. 1, 2: 131–204. 2011 (n. sp., spp. in India, new family). — Hosagoudar & Riju, Mycosphere 2: 157–160. 2011 (n. sp.).

**Sarocladium** W. Gams & D. Hawksw. 1976

Notes — This genus was redefined by Summerbell et al. (2011) to incorporate *Acremonium strictum* and other well-known species.

Ref. Summerbell et al., Stud. Mycol. 68: 139–162. 2011 (revis., n. combs., LSU, SSU).

**Sceloralumaria** Batzer & Crous 2011 — Fung. Diversity 46: 58 (53–66, fig. 1b, 8) / *S. pomigena* Batzer & Crous 2011

CDM: none. SET: none. CPH = CGC: sympodial, hyaline. CDA: amero, didymo or phragmo, hyaline, in branched acropetal chains, dry, schizo. OTHER: sclerotia in vitro.

On fruit (*Asimina, Malus*): Asia, Europe, North America. Five species. ITS barcode: FR716682.

Notes — Anamorphic Ascomycota (between Pleosporales and Botryosphaeriales). Distinguished from *Ramularia* by the formation of sclerotia and longer chains of conidia.

**Scytalidium** Pesante 1956

Refs. H.-J. Kang et al., Mycologia 102: 1167–1184. 2010 (n. sp., n. combs, teleomorph: Xylogone). — Y.M. Wu & T.Y. Zhang, Mycotaxon 114: 205–210. 2011, 2010 (n. spp.).

**Sinomyces** Yong Wang bis & X.G. Zhang 2011 — Fungal Biol. 115: 192 (188–195, fig. 2, 3) / *S. fusoideus* Yong Wang bis & X.G. Zhang 2011

CDM: none. SET: none. CPH: unbranched or sparingly branch-ed, brown, ?or = cgc. CGC: ?mono- or ?polytretic, sympodial, geniculate, brown. CDA: phragmo, brown, single, dry, schizo.

On leaves and seeds (*Daucus, Tamarix*): Asia, North America. Three species.

Notes — Anamorphic Ascomycota (Pleosporaceae, Pleosporales). Segregated from Ulocladium after molecular phylogenetic analysis, but paraphyly of *Alternaria* was not resolved.

**Spicellum** Nicot & Roquevert 1976

= *Trichotheccium* Link 1809 : Fr., fide Summerbell et al. 2011

**Spiroplana** Voglmayr, M.J. Park & H.D. Shin 2011 — Myco-taxon 116: 208 (203–216, fig. 2, 3) / *S. centripeta* Voglmayr, M.J. Park & H.D. Shin 2011

CDM: none. SET: none. CPH: unbranched or sparingly branch-ed, (sub)hyaline. CGC: monoblastic, hyaline. CDA: bulblis, clathroid, with helical primary and secondary branches coiling inward, hyaline, single, dry, schizo.

On leaves (*Deutzia, Philadelphus*): Asia. Two species. ITS barcode: HQ696660.

Notes — Anamorphic Ascomycota (Pleosporaceae). Compare with Clathrosporium, Dendroclathra, Illosporiopsis, Spirophaera.

**Stachybotrys** Corda 1837

Refs. Y.M. Wu & T.Y. Zhang, Mycotaxon 114: 459–462. 2011, ‘2010’ (n. spp.). — Q.R. Li & Y.L. Jiang, Mycotaxon 115: 192 (188–195, fig. 2, 3) / S. fusoideus Yong Wang bis & X.G. Zhang 2011

CDM: none. SET: none. CPH: unbranched or sparingly branch-ed, brown, ?or = cgc. CGC: ?mono- or ?polytretic, sympodial, geniculate, brown. CDA: phragmo, brown, single, dry, schizo.

On leaves and seeds (*Daucus, Tamarix*): Asia, North America. Three species.

Notes — Anamorphic Ascomycota (Pleosporaceae, Pleosporales). Segregated from Ulocladium after molecular phylogenetic analysis, but paraphyly of *Alternaria* was not resolved.

**Stemphyllum** Walr. 1833

Ref. Y.F. Pei et al., Mycol. Progr. 10: 163–173. 2011 (n. spp., multigene).
Stylonectria Höhn. 1884 — Sitzungsber. Kaiserl. Akad. Wiss., Math.-Naturwiss. Cl., Abt. 1, 124: 52 (52–53, no illus.) / S. applanata Höhn. 1915

CDM: none or sporodochia, pale. SET: none. CPH: unbranched or sparingly branched, hyaline. CGC: phialides, hyaline. CDA: amero or didymo, hyaline, falcate (with foot-shaped basal cell), slimy, schizo. OTHER: sparse amero microconidia.

On fungi (ascomycete stromata, e.g. Diatrype, Hapalocyctis, Melogramma) on trees (Betula, Carpinus, Corylus, Ulmus): Europe, North America. Four species.

Notes — Anamorphic and/or teleomorphic Ascomycota (Nectriaceae, Hypocreales). Compare with Fusarium, Cyanocnia, Dialonectria, Dianeea, Geestylessia, Macrocon, Microcera, Stylonectria. This genus was reintroduced by Gräfenhan et al. (2011) for some species formerly included in either Nectria subg. Dialonectria or Cosmospora and their fusarium-like anamorphs.

Ref. (mostly as Fusarium or Cosmospora): Wollenweber & Reinking, Die Fusarien, Paul Parey, Berlin. 1935 (monogr., in German). — Gerlach & Nirenberg, Mitt. Biol. Bundesanst. Ld-u. Forstw. 209: 1–406. 1982 (pictorial atlas). — Samuels et al., Mycol. Pap. 164: 1–48. 1991 (revis. as Nectria subgen. Dialonectria). — Samuels et al., Hypocreales of the SE United States, p. 108. 2006 (illus.). — Gräfenhan et al., Stud. Mycol. 68: 79–113. 2011 (revis., n. name, n. combs., multigene).

Taenielloa S. Hughes 1958

Ref. Zelski et al., Mycosphere 2: 593–600. 2011 (teleomorph: Chaetorostrum).

Taifanglania Z.Q. Liang, Y.F. Han, H.L. Chu & R.T.V. Fox 2009

Ref. Y.F. Han & Z.Q. Liang, Mycol. Pap. 164: 1–48. 2009 (illus.) / Xylomyces nectria D. Hawksw. 1973

Notes — Anamorphic Ascomycota (Teratosphaeriaeae, Cappodiales). Ref. Ruibal et al., IMA Fungus 2, 1: 97–103. 2011 (LSU).

Talaromyces C.R. Benj. 1955 — Mycologia 47: 681 (681–685, no illus.) / T. vermically (P.A. Dang.) C.R. Benj. 1955 = Penicillum vermically P.A Dang. 1907 = Talaromyces flavus (Klöcker) Stolk & Samson 1972

≡ Penicillum subg. Biverticillum Dierckx apud Bourgie Cellule 33: 31. 1923.

Notes — Anamorphic and/or teleomorphic Ascomycota (Tri chocomaecae, Eurotiales). We refer the reader to the monographs of Penicillum sensu lato in the Dictionary of Seifert et al. (2011), and to the section on teleomorphic species assigned to Talaromyces in the Penicillum entry.

Ref. Samson et al., Stud. Mycol. 70: 159–184. 2011 (revis., n. combs., typification).

Thielaviopsis Went 1893

Ref. Van Wyk et al., Fungal Diversity 46: 111–131. 2010 (n. spp.). — Nonnaka et al., Mycoscience 52: 338–343. 2011 (n. sp. as Ceratocystis).

Thozetella Kuntze 1891

Ref. Barossa et al., Mycotaxon 115: 327–334. 2011 (n. sp., key).

Toxicocladosporus Crous & U. Braun 2007

Ref. Crous & Groenewald, Persoonia 26: 70–84. 2011 (n. sp., rDNA).

Trichoderma Pers. 1794 : Fr.

Refs. Sadfi-Zouaoui et al., Canad. J. Microbiol. 55: 154–162. 2009 (spp. in Tunisia). — H.Q. Wu et al., Mycosistema 28: 342–348. 2009 (n. sp.). — De Respinis et al., Mycol. Progr. 9: 79–100. 2010 (chemotaxonomy, MALDI-TOF mass spectrometry). — Chaiverri et al., Mycologia 103: 139–151. 2011 (n. sp., multigene). — Jaklitsch, Fung. Diversity 48: 1–250. 2011 (monogr., European spp. Hypocrea, spp. with hyaline ascospores).

Trichosporonoides Haskins & J.F.T. Spencer 1967

≡ Moniliella Stolk & Dakin 1966, fide Rosa et al. 2009

Trichothecium Link 1809 : Fr.

≡ Spicillum Nicot & Roquebert 1976, fide Summerbell et al. 2011 Ref. Summerbell et al., Stud. Mycol. 68: 139–162. 2011 (revis., n. combs., LSU).

Ulocladium Preuss 1851

Ref. Y. Wang et al., Mycol. Progr. 8: 207–214. 2009 (n. sp., multigene).

Uncispora R.C. Sinclair & Morgan-Jones 1979

Ref. G.Z. Yang et al., Mycotaxon 116: 171–174. 2011 (n. sp.).

Utrechtiana Crous & Quaedvlieg 2011 — Persoonia 26: 153 (152–153, illus.) / U. cibisii Crous & Quaedvlieg 2011 = Deightoniella roumegueri (Cavara) Constant. 1983 = Deightoniella S. Hughes 1952, fide Meïnik, Constantinescu, pers. comm. to WG

Venustosynnema R.F. Castañeda & W.B. Kendr. 1990

Ref. Castañeda et al., Mycotaxon 109: 275–288. 2009 (n. sp.)

Xanthoriicola D. Hawksw. 1973

Notes — Anamorphic Ascomycota (Teratosphaeriaeae, Cappodiales).

Ref. Ruibal et al., IMA Fungus 2, 1: 97–103. 2011 (LSU).

Xenopolyscytal Crous 2010

≡ Sphaeroidium candidum Fuckel 1870, fide Seifert

Xylocadium P. Syd. 1900

Ref. Y.M. Ju et al., Mycologia 103: 424–430. 2011 (n. sp. as teleomorph: Xylaria, multigene).

Xyloymes Goos, R.D. Brooks & Lamore 1977 / X. chlamydo-sporis Goos, R.D. Brooks & Lamore 1977 = Xyloymes anamorph of Jahnula aquatica (Kirschst.) Kirschst. 1936 Teleomorph. Jahnula, fide Sivichai et al. 2011. Ref. Sivichai et al., Mycotaxon 116: 137–142. 2011 (teleomorph: Jahnula).

Zygosporion Mont. 1842

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