
Studies on Amphisphaeriales: The genera excluded from the Amphisphaeriaceae, Cainiaceae and Clypeosphaeriaceae

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The Amphisphaeriaceae and the Cainiaceae have been narrowly defined, while the Clypeosphaeriaceae was broadly defined and considered a relatively large assemblage of ascomycetes whose affinities are uncertain. In this paper, the remaining genera previously included in the Amphisphaeriaceae (*sensu lato*) are dealt with. *Fasciatispora* having unicellular brown ascospores, and *Seynesia* and *Collodiscula* having brown ascospores and an *Acanthodochium* anamorph are similar to xylariaceous taxa and therefore considered best placed in the Xylariaceae. *Muelleromyces* has a parasitic habit on leaves, clypeate ascomata and asci with a J- apical ring and resembles *Phyllachora*, and is placed in the Phyllachoraceae. *Melomastia* is redescribed and illustrated and placed in the Pleurotremataceae. *Chitonospora*, *Dyrithium* and *Iodosphaeria* are redescribed and illustrated, while *Amphisphaerella*, *Ascotaiwania*, *Flagellosphaeria*, *Lindquistomyces*, *Manokwaria*, *Mukhakesa*, *Neohypodiscus*, *Urosporellopsis* and *Xylochora* are discussed. These genera are placed in Ascomycetes incertae sedis as the available morphological data are inadequate to confidently conclude their taxonomic positions.

Key words: Ascomycetes incertae sedis, Phyllachoraceae, Pleurotremataceae, taxonomy, Xylariaceae.

Introduction

The broadly defined Amphisphaeriaceae G. Winter (*sensu* Hawksworth *et al.*, 1995) is a large heterogeneous assemblage of ascomycetes which includes 36 genera and 23 synonyms. Recent molecular studies have found that genera which have *Pestalotia*-like anamorphs have phylogenetic affinities (Kang, Kong and Hyde, 1998). Based on molecular and morphological data and teleomorph-anamorph connections, the Amphisphaeriaceae (*sensu stricto*) has

been restricted to ten teleomorphic genera and their *Pestalotia*-like anamorphs (Kang, Hyde and Kong, 1999a). The remaining genera are placed in other related families based on their morphological data. The Clypeosphaeriaceae G. Winter are retained and include sixteen genera (Kang, Hyde and Kong, 1999b). The Cainiaceae J.C. Krug have been revived to accommodate six genera which have longitudinal germ slits, striations, ridges, or reticulations in the ascospores and the complex apical apparatus comprising a series of rings in the asci (Kang, Hyde and Kong, 1999c). A number of other genera were also included in the broadly defined Amphisphaeriaceae (*sensu* Hawksworth *et al.*, 1995). These genera are discussed in this paper.

Materials and methods

Herbarium specimens were loaned from DAOM, IMI, K and NY. Fungal structures were rehydrated and mounted in water. Sectioning of fungal ascomata was carried out on a cryotome and sections were mounted in lactophenol on a glass slide.

Taxonomy

Xylariaceae Tul. and C. Tul., *Selecta Fungorum Carpologia* 2: 3 (1861).

Fasciatispora K.D. Hyde, *Transaction of the Mycological Society of Japan* 32: 265 (1991).

Type species: Fasciatispora nypae K.D. Hyde.

Anamorph: unknown.

Fasciatispora was introduced by Hyde (1991) as a monotypic genus based on *F. nypae* and presently includes 7 species (Hyde, 1995a). Its ascomata are immersed beneath a thin stroma, asci are cylindrical, with a J+, subapical ring, and ascospores are unicellular and brown. *Fasciatispora* species resemble those of *Anthostomella*, which may be related, and is presently included in the Xylariaceae (Hawksworth *et al.*, 1995; Hyde, 1995a; Laessøe, 1994). *Fasciatispora* is therefore best accommodated in the Xylariaceae.

Seynesia Sacc., *Sylloge Fungorum* 2: 668 (1883), emend Petr., *Annales Mycologici* 25: 338 (1927).

Type species: Seynesia nobilis (Welw. and Curr.) Sacc.

Anamorph: Acanthodochium.

Seynesia was originally introduced for *Pemphidium nobile* Welw. and Curr. by Saccardo (1883) and includes two species (Hyde, 1995b). This genus somewhat resembles *Amphisphaeria* in having brown, bicelled ascospores;

unitunicate, cylindrical asci with a J+ apical ring and paraphyses embedded in a gelatinous matrix. However, the brown ascospores have a single germ slit in each cell, and the anamorph is *Acanthodochium* which are indicative that *Seynesia* belongs in the Xylariaceae (Laessøe, 1994).

Collodiscula I. Hino and Katum., Bulletin of the Faculty of Agriculture, Yamaguchi University 6: 55 (1955).

Type species: Collodiscula japonica I. Hino and Katum.

Anamorph: Acanthodochium.

The monotypic genus *Collodiscula* was introduced to accommodate *C. japonica*. In this genus, brown septate ascospores, which lack a germ slit, resemble those of amphisphaeriaceous taxa. However, the superficial, stromatic ascomata and large, J+, wedge-shaped ascus ring are similar to species placed in *Xylaria*. The *Acanthodochium* anamorph has been linked to *Collodiscula* (Samuels, Rogers, Nagasawa, 1987a) and therefore *Collodiscula* should be included in the Xylariaceae (Laessøe, 1994).

Phyllachoraceae Theiss. and Syd., Annales Mycologici 13: 168 (1915).

Muelleromyces Kamat and Anahosur, Experientia 24: 849 (1968).

Type species: Muelleromyces indicus Kamat and Anahosur.

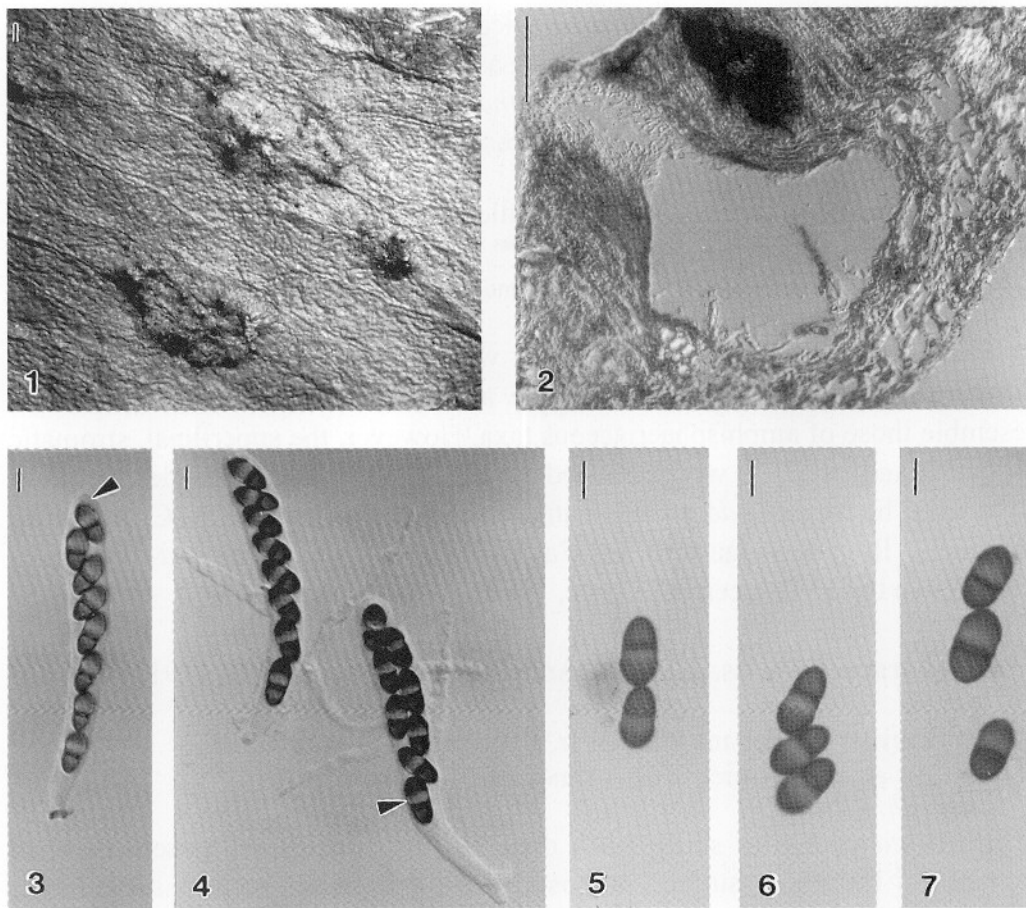
Anamorph: unknown.

Ascomata visible as shiny black dots, clustered in brown, raised, necrotic regions on the upper surface of host leaves; in vertical section subglobose, immersed beneath a clypeus, with a central slightly protruding periphysate ostiolar canal. *Clypeus* composed of compressed host cells and fungal hyphae. *Peridium* comprising several layers of compressed cells, hyaline at base, dark brown around the ostiolar canal. *Paraphyses* filamentous, septate, constricted at the septum, tapering at the ends, not in a gelatinous matrix. *Asci* 8-spored, cylindrical, unitunicate, pedicellate, apically rounded, with a J-, apical ring. *Ascospores* overlapping uniseriate, ellipsoidal, ovoid or rhomboid, brown, unequally bicelled, surrounded by a mucilaginous sheath, septum close to 1/3 near the base, with a wide equatorial pallid band above the septum on the large apical cell.

Muelleromyces indicus Kamat and Anahosur, Experientia 24: 849 (1968).

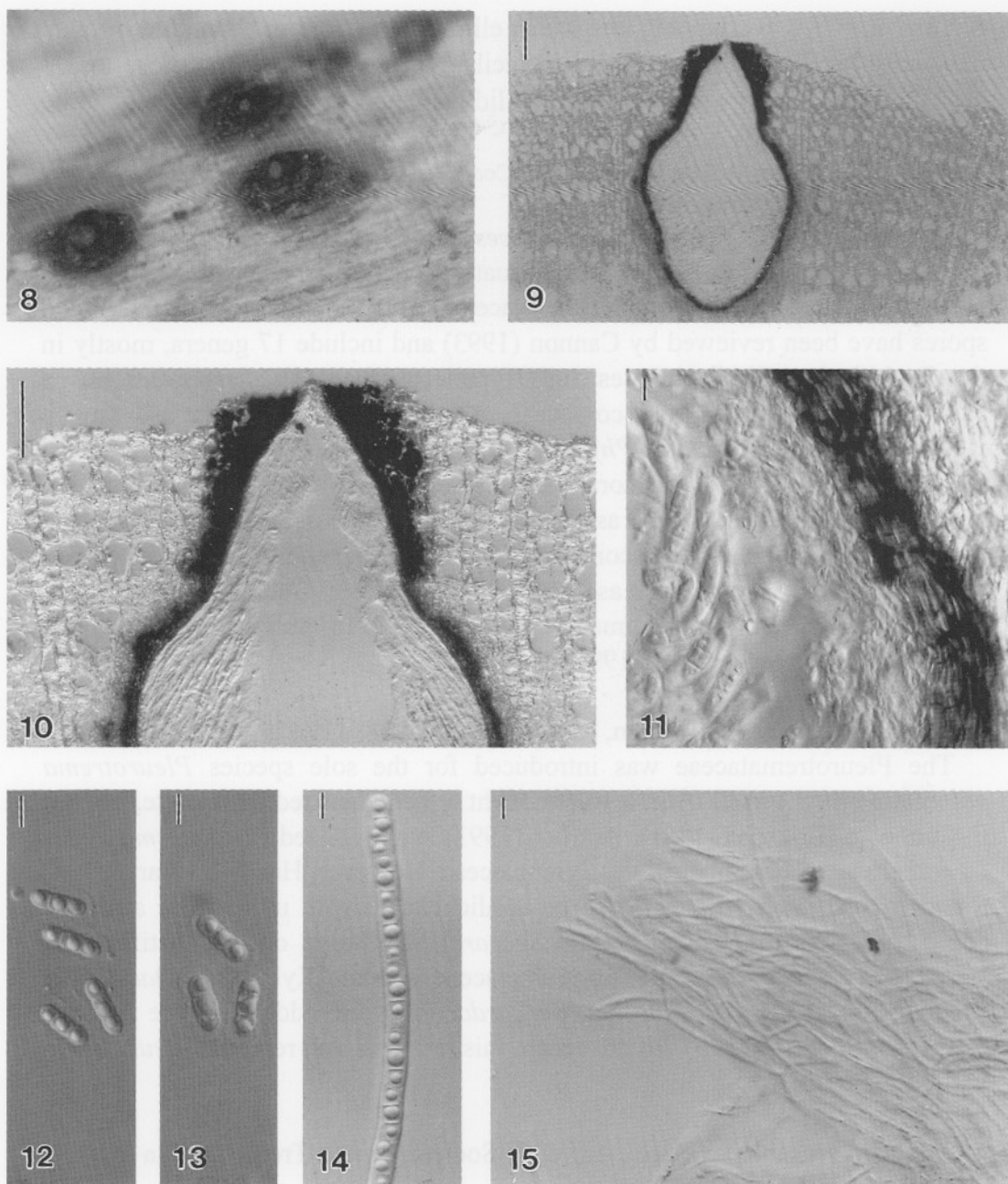
(Figs. 1-7)

Ascomata visible as shiny black dots clustered in brown, raised, necrotic regions ca 1-1.5 × 0.5 mm diam., on the upper surface of host leaf (Fig.1); in vertical section 270-320 µm diam., 200-230 µm high, immersed, subglobose,



Figs. 1-7. Interference light micrographs of *Muelleromyces indicus* (from holotype, IMI 12856). 1. Appearance of ascomata on the upper surface of host leaf. 2. Vertical section through ascoma, with periphysate ostiolar canal. 3. Ascus, with a J-, apical ring (arrowed). 4-7. Asci, paraphyses and unequally bicelled ascospores with a wide equatorial pallid band above the septum on the large apical cell (arrowed). Bars: 1-2 = 100 μ m, 3-7 = 10 μ m.

clypeate, with a central protruding periphysate ostiolar canal, internally lined by numerous, hyaline paraphyses (Fig. 2). *Clypeus* up to 250 μ m diam., composed of compressed host cells and fungal hyphae (Fig. 2). *Peridium* 10-20 μ m wide, comprising several layers of compressed cells, hyaline at base, dark brown around the ostiolar canal (Fig. 2). *Paraphyses* up to 6 μ m diam., filamentous, septate, constricted at the septum, tapering at the ends, not in a gelatinous matrix (Fig. 4). *Asci* 118-160 \times 16-19 μ m (\bar{x} = 132 \times 18 μ m, n = 10), 8-spored, cylindrical, unitunicate, pedicellate, apically rounded, with a J-, apical ring, 3.2 μ m diam., 1.2 μ m high (Figs. 3, 4). *Ascospores* 19-20 \times 6-10 μ m (\bar{x} = 19.3 \times



Figs. 8-15. Interference light micrographs of *Melomastia mastoidea* (from holotype of *Metasphaeria macounii*, DAOM). **8.** Appearance of ascomata on host surface. **9.** Vertical section through ascoma. **10.** Ostiolar canal. **11.** Peridium comprising several layers of dark brown, compressed cells. **12-14.** Ascospores and ascus. **15.** Paraphyses embedded in a gelatinous matrix. Bars: 9-10 = 100 μ m, 11- 15 = 10 μ m.

8.9 μm , $n = 10$), overlapping uniseriate, ellipsoidal, ovoid or rhomboid, brown, unequally bicelled, surrounded by a mucilaginous sheath, septum close to 1/3 near the base, with a wide equatorial pallid band above the septum on the large apical cell (Figs. 5-7).

Material examined: INDIA, Mysore state, Coorg, on leaf of *Eugenia jambolana*, 6 July 1967, K.H. Anahosur (IMI 128561, holotype).

The monotypic genus *Muelleromyces* is represented by *Muelleromyces indicus* (Anahosur, 1968). The wide equatorial pallid band on the ascospores, differs from that in other amphisphaeriaceous taxa. Ascomycetes with banded spores have been reviewed by Cannon (1993) and include 17 genera, mostly in the Dothideales, Phyllachorales and Hyponectriaceae. *Muelleromyces* has a parasitic habit on leaves, its ascomata form under a clypeus and the asci have a J- apical ring which resemble *Phyllachora*, and therefore, *Muelleromyces* is best accommodated in the Phyllachoraceae. It differs from other genera with banded spores in the Phyllachoraceae as follows: *Phaeochorella* Theiss. and Syd. and *Rikatlia* P. Cannon have ascomata which form beneath a well developed clypeus and have unicellular ascospores (Hyde, 1991; Cannon, 1993), while *Pseudothiella* Petr. has ascomata which form in a pulvinate stroma and unicellular ascospores (Hyde, 1991).

Pleurotremataceae W. Watson, New Phytologist 28: 112 (1929).

The Pleurotremataceae was introduced for the sole species *Pleurotrema polysemum* (Nyl.) Müll. Arg. It was thought to be lichenized, bitunicate, but not fissitunicate (Eriksson, 1981). Aptroot (1991) synonymized *Pleurotrema* under *Lithothelium* as a member of the Pyrenulaceae. However, Harris (in Barr, 1994) found *Pleurotrema polysemum* to be nonlichenized with unitunicate asci that could be related to *Melomastia* and *Saccardoëlla*. Based on this justification, Barr (1994) transferred the Pleurotremataceae into the Xylariales. *Daruvedia*, *Phomatospora*, *Melomastia* and *Saccardoëlla* were added to the family. Hawksworth *et al.* (1995) did not accept this proposal and retained *Pleurotrema* in the Pyrenulales.

Melomastia Nitschke ex Sacc., Atti della Società Veneto-Trentino della Scienze Naturali Padova 4: 90 (1875).

Type species: *Melomastia mastoidea* (Fr.) J.Schröt.

Anamorph: unknown.

Ascomata visible as raised, dome-shaped, black dots on the host surface; in vertical section obpyriform, immersed, with a central periphysate ostiolar canal. *Peridium* comprising several layers of dark brown, compressed cells.

Paraphyses filamentous, flexuose, numerous, and embedded in a gelatinous matrix. *Asci* 8-spored, cylindrical, unitunicate, pedicellate, apically rounded, with a J-, subapical ring. *Ascospores* uniseriate, ovoid, hyaline, 2-septate, constricted at the septum, with a lipid globule in each cell, and surrounded by a gelatinous sheath.

Melomastia mastoidea (Fr.) J. Schröt., in Cohn, Kryptogamen-Flora Schlesien 3: 320 (1894). (Figs. 8-15)

For synonyms see Barr (1994).

Ascomata visible as raised, dome-shaped, black dots on the host surface (Fig. 8); in vertical section 500-762 μm high, 350-435 μm diam., obpyriform, immersed, with a central ostiolar canal, ca 230 μm long, 250 μm wide, internally lined with hyaline paraphyses (Figs. 9, 10). *Peridium* 21-35 μm wide, comprising several layers of dark brown, compressed cells (Fig. 11). *Paraphyses* ca 3 μm diam., filamentous, flexuose, numerous, and embedded in a gelatinous matrix (Fig. 15). *Asci* 160-288 \times 6-10 μm (\bar{x} = 198.7 \times 8.3 μm , n = 10), 8-spored, cylindrical, unitunicate, pedicellate, apically rounded, with a J-, subapical ring (Fig. 14). *Ascospores* 16-19 \times 5-6 μm (\bar{x} = 18.1 \times 5.4 μm , n = 10), uniseriate, ovoid, hyaline, 2-septate, constricted at the septum, with lipid globules in each cell, surrounded by a gelatinous sheath (Figs. 12, 13).

Material examined: CANADA, British Columbia, *Rosa*, Comox, June 1915, J. Macoun 637a, Herb. Dearness (DAOM, holotype of *Metasphaeria macounii*).

The monotypic genus *Melomastia* was introduced to accommodate *M. mastoidea*. The morphology of the ascus in *Melomastia* is unclear and open to various interpretation. The paraphyses are narrow, numerous, infrequently septate and embedded in a gel, which are unlike those found in *Clypeosphaeria* Fuckel. The asci are thick-walled, but lack fissitunicate dehiscence. A similar situation is apparent in *Saccardoëlla* Speg. and *Roussoëlla* Sacc. (Hyde, 1997). Barr (1994) has included genera with this type of asci in the Pleurotremataceae. Whether Pleurotremataceae is a good family is presently debatable. However, this group of fungi do appear to form a monophyletic group with similar asci. The lichenized *Strigula* Fr. also has similar ascal types.

Ascomycetes incertae sedis

Amphisphaerella (Sacc.) Kirschst., Transactions of the British Mycological Society 18: 306 (1934).

Type species: *Amphisphaerella amphisphaerioides* (Sacc. and Speg.) Kirschst.

Anamorph: unknown.

Amphisphaerella is presently included in the broadly defined Amphisphaeriaceae (*sensu* Hawksworth *et al.*, 1995). However its brown

unicellular ascospores with equatorial germ pores and the lack of J+ ascus ring (Hyde, 1991) are quite distinct amongst most amphisphaeriaceous taxa. This indicates that *Amphisphaerella* may not be related to the Amphisphaeriaceae (*sensu stricto*).

Ascotaiwania Sivan. and H.S. Chang, Mycological Research 96: 481 (1992).

Type species: Ascotaiwania lignicola Sivan. and H.S. Chang.

Anamorph: Monotosporella.

Ascotaiwania species occur on submerged wood in streams, or on terrestrial palms. Ascomata are partially to fully immersed and dark. Asci are long cylindrical with a relatively massive apical ring. Ascospores are 3-7 septate with hyaline end cells capped by mucilage (Sivanesan and Chang, 1992; Hyde, 1995c). *Ascotaiwania* was accommodated in the Annulatasaceae (Wong, Hyde and Jones, 1998).

Chitonospora E. Bommer, M. Rousseau and Sacc., Sylloge Fungorum 9: 797 (1891).

Type species: Chitonospora ammophila E. Bommer, M. Rousseau and Sacc.

Anamorph: unknown.

Ascomata visible as dome-shaped, black dots, erumpent through the cracks on the host surface; in vertical section subglobose or globose, immersed with a central ostiolar canal, internally lined with hyaline periphyses. *Peridium* comprising several layers of dark brown, compressed cells. *Paraphyses* filamentous, flexuose, numerous, and embedded in a gelatinous matrix. *Asci* 8-spored, broadly cylindrical, unitunicate, pedicellate, apically rounded, lacking any ring-like structure. *Ascospores* over-lapping uniseriate or biseriate, oval, brown, 3-pseudoseptate, not constricted at the sepum, whitish at the apexes, and surrounded by a gelatinous sheath.

Chitonospora ammophila E. Bommer, M. Rousseau and Sacc., Sylloge Fungorum 9: 797 (1891). (Figs. 16-28)

Ascomata visible as dome-shaped, black dots erumpent through the cracks on the host surface (Fig. 16); in vertical section 320-384 μm diam., 140-173 μm high, immersed, subglobose, with a central ostiolar canal, 50-64 μm wide, 96-109 μm long, internally lined by hyaline periphyses (Figs. 17, 19). *Peridium* 21-34 μm wide, comprising several layers of dark brown, compressed cells (Fig. 18). *Paraphyses* up to 5 μm diam., filamentous, flexuose, numerous, and embedded in a gelatinous matrix (Fig. 20). *Asci* 112-136 \times 24-35 μm (\bar{x} = 123 \times 28 μm , n = 10), 8-spored, broadly cylindrical, unitunicate, pedicellate, apically rounded,

lacking any ring-like structure (Figs. 21-24). *Ascospores* 22-30 × 11-14 μm (\bar{x} = 27 × 13 μm, n = 10), over-lapping uniseriate or biseriate, oval, brown, 3-pseudoseptate, whitish at the ends, and surrounded by a gelatinous sheath (Figs. 25-28).

Material examined: BELGIUM, Kilmory, on *Psamma arenaria*, 23 July 1951, R.W.G. Dennis (K 34681).

The monotypic genus *Chitonospora* is typified by *C. ammophila* (Saccardo, 1883). It resembles amphisphaeriaceous taxa in having subglobose ascomata and filamentous paraphyses, embedded in a gelatinous matrix. It differs in having clavate asci which lack a J+, ascus ring. It is similar to the genera in the Cainiaceae in its grass host. The oval, brown, 3-pseudoseptate ascospores are quite similar to those of *Blogiascospora*.

Dyrithium M.E. Barr, Mycotaxon 51: 204 (1994).

Type species: *Dyrithium lividum* (Fr.) M.E. Barr.

Anamorph: unknown.

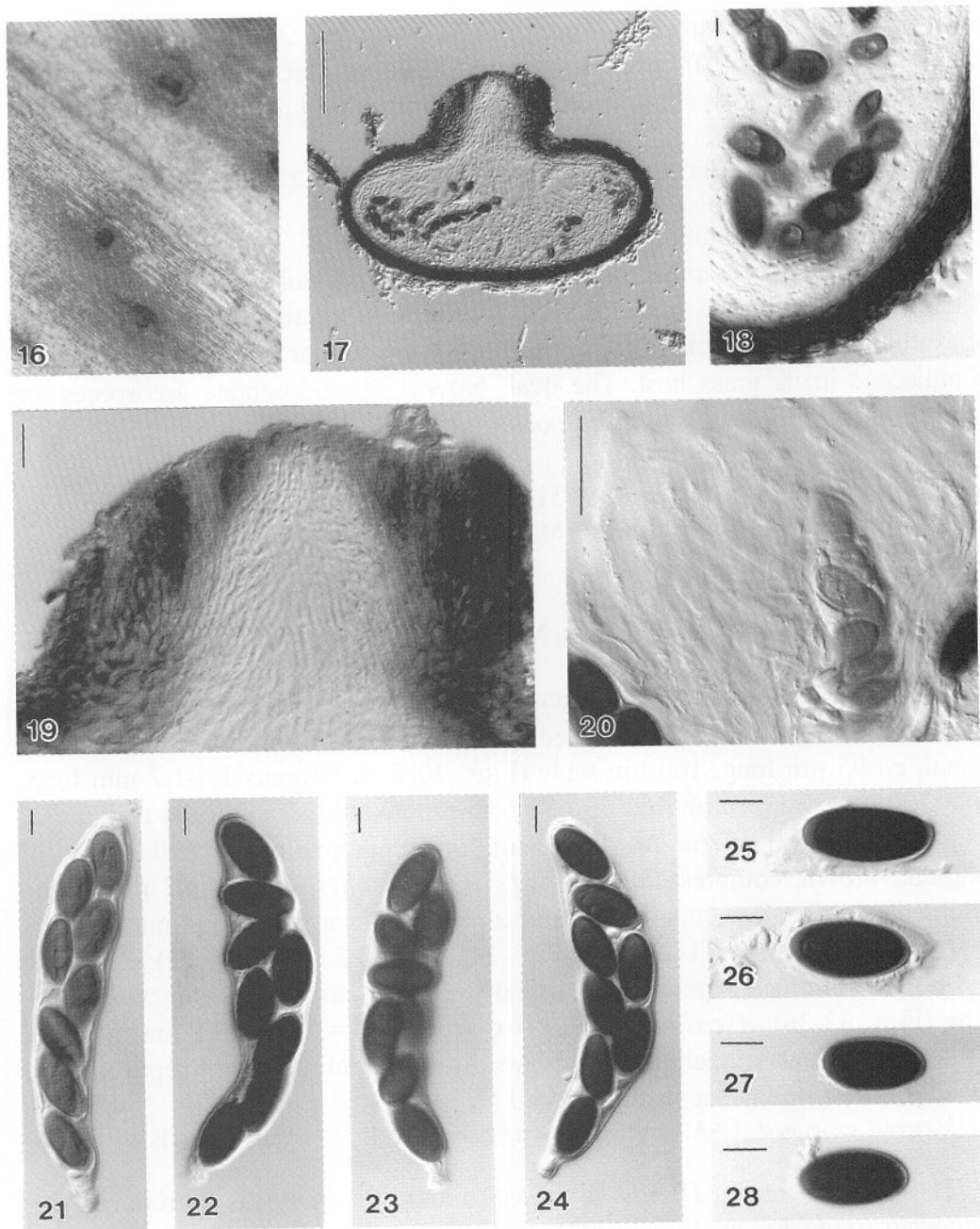
Dyrithium lividum (Fr.) M.E. Barr, Mycotaxon 51: 191 (1994). (Figs. 29-40)

For synonyms see Barr (1994).

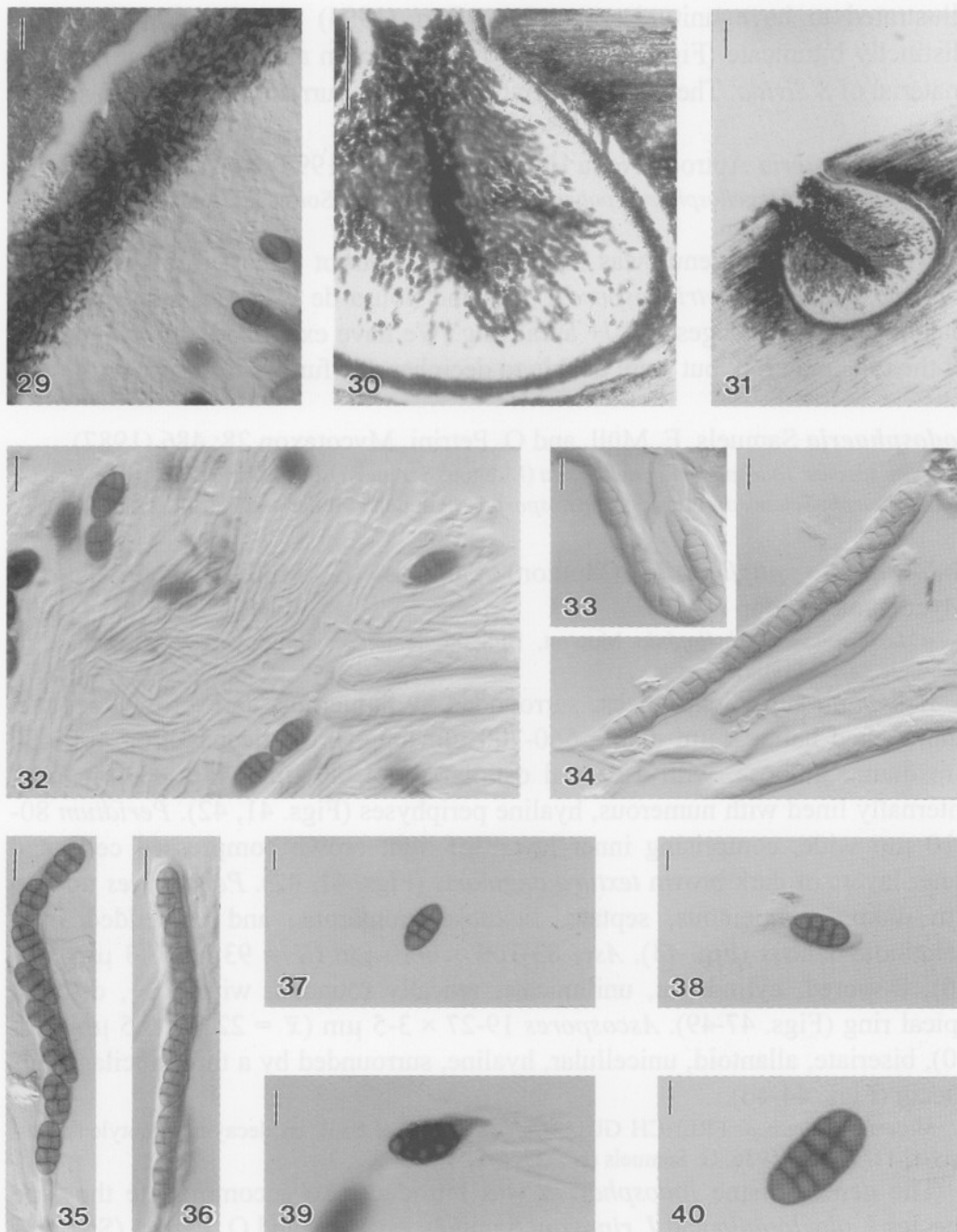
Ascomata visible as black, circular dots on the host surface; in vertical section ca 550 μm diam., immersed, globose, clypeate, with a central ostiolar canal, ca 95 μm long, 160 μm wide (Figs. 30, 31). *Clypeus* 1.4-1.7 mm long, 448-700 μm wide, composed of dark brown compressed host cells and fungal hyphae (Fig. 31). *Peridium* 11-38 μm wide comprising several layers of angular, brown, compressed cells (Fig. 29). *Paraphyses* up to 3.2 μm diam., filamentous, flexuose, numerous, and embedded in a gelatinous matrix (Fig. 32). *Asci* 128-162 × 11-14 μm (\bar{x} = 141.5 × 13.2 μm, n = 10), 8-spored, cylindrical, bitunicate, pedicellate, apically rounded, with an indistinct J-, apical ring (Figs. 33-36). *Ascospores* 16-23 × 6-10 μm (\bar{x} = 18.5 × 8.5 μm, n = 10), overlapping uniseriate, ellipsoidal, brown, with several transverse septa and one to several longitudinal septa in each cell (Figs. 37-40).

Material examined: USA, Iowa, *Juniperus communis* L., 31 Aug. 1882, E.W. Holway (NY139).

The generic name *Dyrithium* based on *D. lividum* was introduced for *Sphaeria livida* Fr. by Barr (1994). *S. livida* was formerly named *Thyridium lividum* (Pers.: Fr.) Sacc. However, the type species of *Thyridium*, *T. vestitum* (Fr.) Fuckel is not congeneric with *Dyrithium* (Eriksson and Hawksworth, 1994). Many species included in the genus *Thyridium* were found to have bitunicate asci and therefore excluded (Barr, 1990). In this study, we have examined a collection of *D. lividum* (*Sphaeria livida*) which was cited and



Figs. 16-28. Interference light micrographs of *Chitonospora ammophila* (from K34681). 16. Appearance of ascomata on host surface. 17. Vertical section through ascoma. 18. Peridium. 19. Ostiolar canal internally lined by hyaline paraphyses. 20. Paraphyses embedded in a gelatinous matrix. 21-24. Asci. 25-28. Ascospores surrounded by a gelatinous sheath. Bars: 17 = 100 μ m, 18-28 = 10 μ m.



Figs. 29-40. Interference light micrographs of *Dyrithium lividum* (from NY 139). 29. Peridium. 30-31. Vertical section through ascoma. 32. Paraphyses embedded in a gelatinous matrix. 33. Ascus with broken layer, showing bitunicate structure. 34-36. Asci, with an indistinct J-, apical ring. 37-40. Ascospores. Bars: 29, 32-40 = 10 μ m, 33-31 = 100 μ m.

illustrated to have unitunicate asci by Barr (1994) and found the asci are distinctly bitunicate (Figs. 33-36). We have not been able to examine the type material of *S. livida*. There is considerable confusion surrounding this genus.

Flagellosphaeria Aptroot, Nova Hedwigia 60: 336 (1995).

Type species: Flagellosphaeria polytrichospora (Lucas and Sousa de Câmara) Aptroot.

Anamorph: unknown.

This monotypic genus was introduced by Aptroot (1995) to accommodate *Didymosphaeria polytrichospora* Lucas and Sousa de Câmara, a species with flagelliform appendages and J+ ascus ring. We have examined a prepared slide of the type material, but were unable to decipher any further information.

Iodosphaeria Samuels, E. Müll. and O. Petrini, Mycotaxon 28: 486 (1987).

Type species: Iodosphaeria phyllophila (Mouton) Samuels, E. Müll. and O. Petrini.

Anamorph: Selenosporella and *Ceratosporium* (Samuels, Müller and Petrini, 1987b).

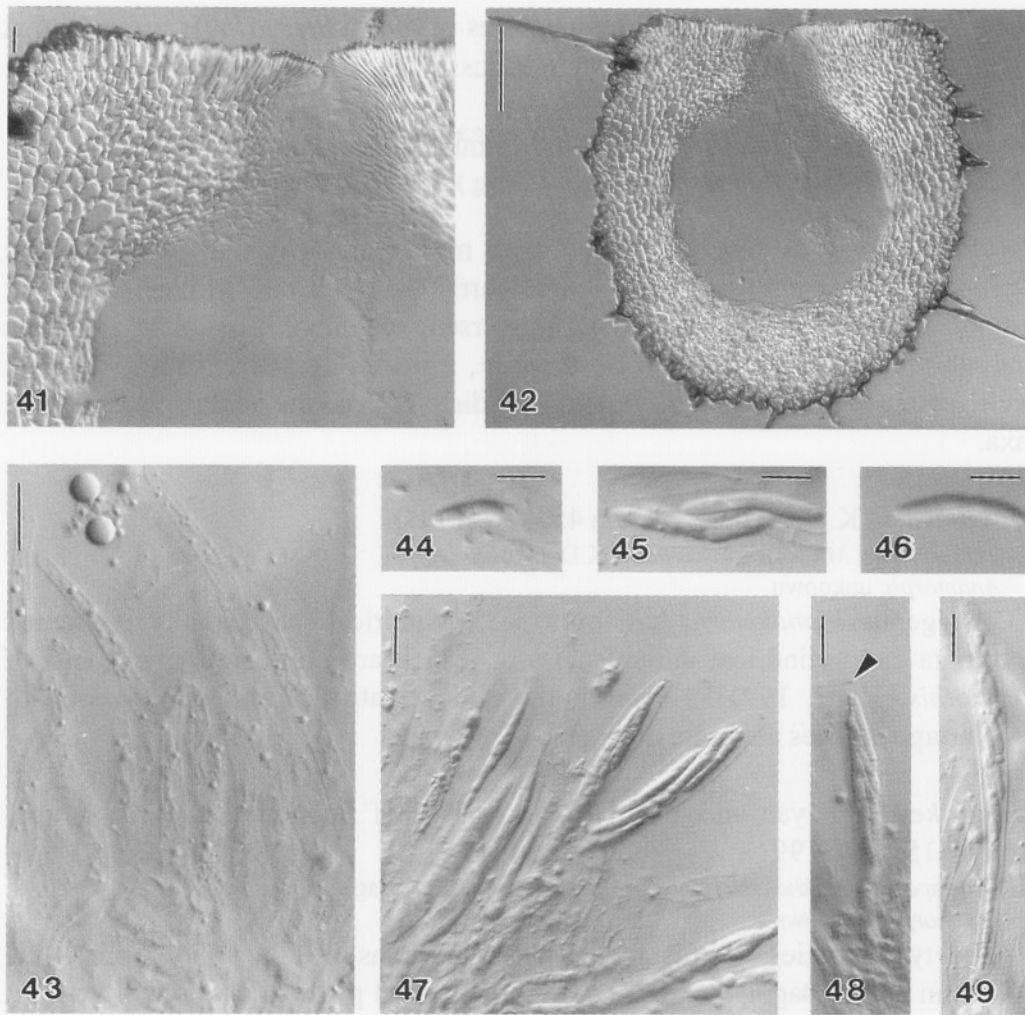
Iodosphaeria phyllophila (Mouton) Samuels, E. Müll. and O. Petrini, Mycotaxon 28: 486 (1987). (Figs. 41-49)

≡ *Lasio-sphaeria phyllophila* Mouton, Bulletin de la Société Royale de Botanique de Belgique 34: 48 (1900).

Ascomata superficial, black, surrounded by numerous, dark brown, septate, unbranched hairs, 8 µm diam., 560-700 µm long; in vertical section 400-450 µm diam., globose, with a central ostiolar canal, 80 µm wide, 80 µm long, internally lined with numerous, hyaline periphyses (Figs. 41, 42). *Peridium* 80-110 µm wide, comprising inner layers of light brown compressed cells and outer layers of dark brown *textura angularis* (Figs. 41, 42). *Paraphyses* up to 4 µm diam., filamentous, septate, flexuose, numerous, and embedded in a gelatinous matrix (Fig. 43). *Asci* 83-109 × 6-10 µm (\bar{x} = 93.9 × 8.3 µm, n = 10), 8-spored, cylindrical, unitunicate, apically rounded, with a J+, discoid, apical ring (Figs. 47-49). *Ascospores* 19-27 × 3-5 µm (\bar{x} = 22.7 × 3.5 µm, n = 10), biserial, allantoid, unicellular, hyaline, surrounded by a thin mucilaginous sheath (Figs. 44-46).

Material examined: FRENCH GUIANA, 7 km. SW of Saul, on decaying dicotyledonous leaves, 11-13 Feb. 1986, G. Samuels (NY 3704).

The generic name *Iodosphaeria* was introduced to accommodate the type species *I. phyllophila* and *I. ripogoni* Samuels, E. Müll. and O. Petrini (Samuels *et al.*, 1987b). Barr (1993) transferred *Trichosphaeria arundinariae* Ellis and Everh. to *I. arundinariae* (Ellis and Everh.) M.E. Barr and referred it to the Lasiosphaeriaceae in the Sordariales. Hyde (1995d) added *I. aquatica* K.D. Hyde, which was atypical. Hsieh, Chen and Sivanesan (1997) described *I.*



Figs. 41-49. Interference light contrast micrographs of *Iodosphaeria phyllophila* (from NY3704). **41.** Ostiolar canal internally lined by hyaline periphyses. **42.** Vertical section through ascoma, surrounded by brown, septate, unbranched hairs. **43.** Paraphyses, embedded in a gelatinous matrix. **44-46.** Ascospores. **47-49.** Asci with a J+, discoid, apical ring (arrowed). Bars: 41, 43-49 = 10 μ m, 42 = 100 μ m.

polygona as a new species from Taiwan. The unicellular hyaline ascospores and the unitunicate asci with J+, subapical ring resemble those of the broadly defined amphisphaeriaceous taxa (Hawksworth *et al.*, 1995). *Iodosphaeria* has unique superficial ascomata surrounded by numerous, dark brown, septate, unbranched hairs. Synanamorphs of *Selenosporella* and *Ceratosporium* have

been found in association with both species of *Iodosphaeria*. It is unlikely that it belongs to any of the families under discussion.

Lindquistomyces Aramb., E. Müll. and Gamundí, *Sydowia* 35: 6 (1982).

Type species: Lindquistomyces antarcticus (Speg.) Aramb., E. Müll. and Gamundí.

Anamorph: unknown.

Lindquistomyces was introduced as a monotypic genus to accommodate *Ophiobolus antarcticus* Speg. by Arambarri, Gamundí and Müller (1982). It resembles *Amphisphaeria* in having immersed, subglobose, ostiolate ascomata and unitunicate, cylindrical asci, with J+, apical ring. Its filiform, hyaline, multiseptate ascospores, however are very distinct from the amphisphaeriaceous taxa.

Manokwaria K.D. Hyde, *Sydowia* 45: 246 (1993).

Type species: Manokwaria notabilis K.D. Hyde.

Anamorph: unknown.

The genus *Manokwaria* has immersed, cylindrical, horizontally orientated ascomata and cylindrical unitunicate asci, which are quite similar to those of *Oxydothis* (Hyde, 1993). However, the multiseptate filiform ascospores with bipolar appendages are quite distinct.

Mukhakesa Udaiyan and V.S. Hosag., *Journal of Economic and Taxonomic Botany* 15: 651 (1991).

Type species: Mukhakesa lignicola Udaiyan and V.S. Hosag.

Anamorph: unknown.

The type species of this monotypic genus has been invalidly published (Udaiyan and Hosagoudar, 1991) as a holotype and place of deposition was not designated. The massive ascus ring and hairs around the neck indicate an unlikely relationship with the Amphisphaeriaceae.

Neohypodiscus J.D. Rogers, Y.M. Ju and Læssøe, *Mycologia* 86: 684 (1994).

Type species: Neohypodiscus rickii (Lloyd) J.D. Rogers, Y.M. Ju and Læssøe.

Anamorph: unknown.

Neohypodiscus was introduced by Rogers, Ju and Laessøe (1994) as a new name for *Hypodiscus* and included three species. Rogers *et al.* (1994) tentatively placed it in the Amphisphaeriaceae *sensu lato*. They did not consider it to be a member of the Xylariaceae. The pulvinate stroma and refractive ring of *Neohypodiscus* is unlike those of the species in either the Amphisphaeriaceae or Clypeosphaeriaceae.

Urosporellopsis W.H. Hsieh, C.Y. Chen and A. Sivan., Mycological Research 98: 101 (1994).

Type species: Urosporellopsis taiwaniensis W.H. Hsieh, C.Y. Chen and A. Sivan.

Anamorph: unknown.

The monotypic genus *Urosporellopsis* (Hsieh, Chen and Sivanesan, 1994) has ascospores with a basal cell forming a slender, filiform appendage, and has clavate asci lacking an apical apparatus. It has no resemblance to the Amphisphaeriaceae or Clypeosphaeriaceae.

Xylochora Arx and E. Müll., Beiträge zur Kryptogamenflora der Schweiz 11: 176 (1954).

Type species: Xylochora craticola (Wegele) Arx and E. Müll.

Anamorph: unknown.

This genus contains two species (Arx and Müller, 1954). The relationships of this genus to other fungi are unclear.

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