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Mycosphere notes 275-324: A morpho-taxonomic revision and typification of obscure Dothideomycetes genera (*incertae sedis*)

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Abstract

This is the 6th in a series, *Mycosphere notes*, wherein 50 taxonomic notes are provided based on types of genera and specimens in the class Dothideomycetes. These genera have so far not been formally accommodated at any lower taxonomic rank and therefore referred to the Dothideomycetes genera *incertae sedis*. Notes on the economic significance, wherever known, of each genus are also provided, wherever known. Three new families, viz. Dubujianaceae, Endosporiaceae and Macrovalsariaceae, are introduced in this paper. Thirteen genera namely *Acarella* Syd., *Asteronia* (Sacc.) P. Henn., *Belizeana* Kohlm. & Volkm., *Bonaria* Bat., *Byssocallis* Syd., *Byssolophis* Clem., *Dothichiza* Lib. ex Roum., *Dothidasteromella* Höhn., *Englerodothis* Theiss. & Syd., *Eumela* Syd., *Gibbago* E.G. Simmon, *Gibberidea* Fuckel and *Koordersiella* Höhn are assigned to other families based on morphological investigation and phylogenetic analysis of sequence data available in GenBank. *Acarella costaricensis* Syd. and *Perizomella inquinans* Syd. are synonymized based on morphology and transferred to the family Vizellaceae. *Chaetosticta perforata* (Ellis & Everh.) Petr. & Syd. (≡ *Chaetomella perforata* Ellis & Everh.) and *Pyrenochaeta erysiphoides* Sacc. are synonymized, as all the three species share similar morphological characters and all were collected from the same host (*Cirsium* sp). The genus *Kullhemia* P. Karst. is synonymized under *Strangospora* Körb. based on morphology. The genus *Didymocyrtidium* Vain. is typified with *Didymocyrtidium nudum* Vain. (H6022676) as type species. Four genera namely

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Bahusutrabeeja Subram. & Bhat, *Botryohypoxylon* Samuels & J.D. Rogers, *Dilophospora* Desm. and *Hassea* Zahlbr. are excluded from the Dothideomycetes. All taxa are described and illustrated.

Key words – Antennulariellaceae – Botryosphaeriaceae – Dothidotthiaceae – Dubujianaceae – Lophiostomataceae – Lophiotremataceae – Morphology – Microtheliopsidaceae – Naetrocymbaceae – Perisporiopsidaceae – Phylogeny – Sporocadaceae – Species – Taxonomy – Trematosphaeriaceae – Macrovalsariaceae

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Introduction

Dothideomycetes is the largest class in the Phylum Ascomycota (Kirk et al. 2008, Hyde et al. 2013,) and is characterized by bitunicate and mostly fissitunicate asci (Barr et al. 1979a, b, Berbee 1996, Kirk et al. 2008, Hyde et al. 2013). Species of Dothideomycetes can be endophytes, epiphytes or pathogens on plants, hyper-parasites on other fungi and saprobic or symbiotic with lichens (Taylor et al. 2001, Schoch et al. 2009, Ariyawansa et al. 2014a, 2015, Lücking et al. 2016, , Wanasinghe et al 2017, Tennakoon et al 2018, Jayasiri et al 2019). In recent years, there have been several studies using phylogenetic analyses that have helped to clarify the taxonomic placement of a large number of genera and species and even aided to establish new families (Lumbsch & Lindemuth 2000, Kodsueb et al 2006a, b, Nelsen et al. 2009, 2011a, Zhang et al. 2012, Zhang et al 2019). However, many studies concentrated mainly on DNA sequence analyses and little attention has been paid to simultaneous morphological characterization (Schoch et al. 2009, Nelsen et al. 2009, 2011b, Phookamsak et al. 2019, Hyde et al. 2019). Those genera without DNA sequence data have not been looked into despite their economic importance. We are in the

process of studying genera currently considered as the Dothideomycetes, genera *incertae sedis* (Ariyawansa et al. 2013, Ariyawansa et al. 2014b, Tian et al. 2014, Thambugala et al. 2014, and Wijayawardene et al. 2014a, Doilom et al. 2018). Wijayawardene et al. (2017) listed the taxonomic placements of 1261 genera as an outline and 239 genera were recorded in Dothideomycetes genera *incertae sedis* in the recently published 'Outline of Ascomycota: 2017' (Wijayawardene et al. 2018). Our studies involve investigation of types or authentic specimens of the genera that have so far been poorly described and establishment of up-to-date descriptions and graphics or photomicrographs, in an attempt to clarify the taxonomic placement of these fungi at the familial and ordinal levels (Table 1). It is anticipated that these genera will be re-collected and molecular data will be provided to confirm their correct placement in future. The data from this paper will be added to the Dothideomycetes website (Dothideomycetes.org, Pem et al. 2019).

Materials and Methods

Examination of herbarium material

The holotype and other specimens were borrowed from the fungal herbarium collections of Bishop Museum (BISH), Cornell Plant Pathology Herbarium (CUP), Kew Royal Botanic Gardens (K & IMI), Conservatoire et Jardin botaniques de la Ville de Genève (G), Farlow Reference Library and Herbarium of Cryptogamic Botany in Harvard University (FH), Karl-Franzens-Universität Graz (GZU), University of Illinois (ILL), University of North Carolina at Chapel Hill (IMS), University of Michigan (MICH), New York Botanical Garden (NY), New Zealand Fungarium Landcare Research (PDD), Swedish Museum of Natural History (S), Microfungus Collection and Herbarium, University of California (UC), UAMH Centre for Global Microfungal Biodiversity (UMAH) and Umea University (UME). Fungal structures on the host substrate were observed with a stereo microscope (Motic SMZ-168) and morphological features were examined using a Nikon ECLIPSE 80i compound microscope fitted with a Canon 750D digital camera. Ascomata were first rehydrated in 5% KOH. Sections were cut by hand with a razor blade. Fine forceps were used to remove sectioned ascomata and mount in water. Cotton blue and Melzer's reageant were added to water mounts to observe characters that were not clear. Photomicrographs were processed with Adobe Photoshop CS6 Extended version 10.0 (Adobe Systems, USA). Measurements were made using Tarosoft (R) Image Frame Work. Faces of fungi numbers and Index Fungorum numbers were obtained as detailed in Jayasiri et al. (2015) and Index Fungorum (2019).

Phylogenetic Analyses

DNA sequences of internal transcribed spacer (ITS), small subunit ribosomal RNA (SSU) large subunit ribosomal RNA (LSU) and Translation Elongator factor alpha (TEF) were obtained from GenBank and following recent publications (Liu et al. 2017). Analysis of a wide taxon sampling encompassing all the families of the class Dothideomycetes was performed. Unrelated or ambiguous taxons were excluded and separate trees for each genus of interest (*Asteromassaria*, *Byssothecium*, *Bahusakala*, *Byssolophis*, *Dothichiza*, *Endosporium*, *Gibbago*, *Gibberidea*, *Lignosphaeria* and *Macrovalsaria*) were selected and analysed separately. Datasets for each gene (ITS, SSU, LSU, TEF) were aligned separately with MAFFT version 6 (Katoh and Toh 2008) with subsequent manual adjustment in BioEdit 5.0.9 (Hall 1999). The software package jModeltest 2.1.1 was used to select the best-fitting models of nucleotide substitution for each gene. The Bayesian information criterion supported the GTR + G + I model as the best fit for ITS, SSU, LSU, TEF gene regions. Topological congruence of datasets was checked by visual comparison of phylogenetic trees obtained from maximum likelihood-based analysis with RAxML (Stamatakis et al. 2008). The Bayesian inference was conducted under different models for each partition of the matrix as evaluated by MrModeltest 2.2 (Nylander et al. 2004). Six simultaneous Markov chains were run for 100 million generations and every 1000th generation a tree was sampled. MCMC heated chain was set with a "temperature" value of 0.15. All sampled topologies beneath the asymptote (25%) were

discarded as part of a burn-in procedure and the remaining trees were used for computing posterior probabilities in the majority rule consensus tree. Branches with Bayesian posterior probabilities greater than 0.90 above each node are given in the phylogenetic trees. Phylograms were visualized with FigTree v1.4.0 program (Rambaut 2012) and reorganized in Microsoft power point (2007) and Adobe Illustrator CS5 (Version 15.0.0, Adobe, San Jose, CA).

Results

Taxonomy

We follow the Outline of Ascomycota: 2009 by Lumbsch and Huhndorf (2010) and the Outline of Ascomycota: 2017 by Wijayawardene et al. (2018) for the arrangement of Ascomycota below.

Asterinales M.E. Barr ex D. Hawksw. & O.E. Erikss. (= *Asterotexales* Firmino et al.)
Asterinaceae Hansf.

Dothidasteromella Höhn., Sber. Akad. Wiss. Wien, Math.-naturw. Kl., Abt. 1 119: 421 (1910)

Epiphytic on leaf of *Cinnamomum japonicum*, forming large blackened circular areas 1–2 mm. Superficial hyphae, brown to dark brown, difficult to remove from the surface of host. Sexual morph: *Thyriothecia* superficial, erumpent from mycelia mass, solitary or gregarious, globose to subglobose, more or less carbonaceous, difficult to remove from the host surface, opening by linear or sometimes Y-shaped at the centre of the thyriothecium. *Peridium* comprising 2-layers, outer layer dark brown, inner layer hyaline, comprising cells of *textura angularis*. *Hamathecium* usually lacking pseudoparaphyses. *Asci* 8-spored, bitunicate, fissitunicate, oblong or subglobose, lacking a pedicel, apical region of asci usually with a thick opaque ocular chamber. *Ascospores* overlappingly bi-seriate, hyaline, ellipsoidal to fusoid, 1-septate, deeply constricted at the septum, upper cell broader and shorter than lower cell, verrucose. Asexual morph: Undetermined.

Type species – *Dothidasteromella sepulta* (Berk. & M.A. Curtis) Höhn. 1910

Notes – *Dothidasteromella* was introduced by Höhnel (1910) to accommodate *Dothidasteromella sepulta* as the type species. The genus is characterized by brown to dark brown superficial hyphae forming blackened circular areas, superficial carbonaceous thyriothecia, a peridium of *textura angularis*, oblong or subglobose 8-spored asci and hyaline to brown, 1-septate, ellipsoidal to fusoid ascospores. The genus *Dothidasteromella* was placed in the family Asterinaceae based on presence of subcuticular hypostromata and superficial hyphae without appressoria by Von Arx and Müller (1975). There are currently 13 epithets under the genus *Dothidasteromella*. Hongsanan et al. (2014) studied the isotype and holotype specimen and placed the genus in Dothideomycetes genera *incertae sedis* as the characters of the asci and ascospores were not clear. In this study, we re-observed the holotype specimen (F56756). Based on the morphological re-examination of the specimen, it is characterized by Y-shaped thyriothecia, 8-spored oblong to subglobose asci, lacking a pedicel and 1-septate brown ascospores which are typical of the genus *Asterina*, accommodated in Asterinaceae. We therefore, place the genus *Dothidasteromella* in Asterinaceae until molecular data becomes available for further confirmation.

Dothidasteromella sepulta (Berk. & M.A. Curtis) Höhn., Sber. Akad. Wiss. Wien, Math.-naturw. Kl., Abt. 1 119: 421 (1910) Fig. 1

≡ *Asterina sepulta* Berk. & M.A. Curtis, Proc. Amer. Acad. Arts & Sci. 4: 129 (1860) Index Fungorum number: IF 195171; Facesoffungi number: FoF 06236

Epiphytic on leaf of *Cinnamomum japonicum*, forming large, blackened, 1–2 mm, circular areas. *Colonies* 2–4 μm diam., ($\overline{x}$ = 3 μm, n = 10), brown to dark brown, difficult to remove from the surface of host. Sexual morph: *Thyriothecia* 624–882 high μm × 493–1836 diam. ($\overline{x}$ = 1061 × 706 μm, n = 6), superficial, erumpent from mycelia mass, solitary or gregarious, globose to subglobose, more or less carbonaceous, difficult to remove from the host surface, opening by linear or sometimes Y-shaped at the centre of thyriothecium. *Peridium* 7–11.5 μm diam., comprising 2-

Figure 1 – *Dothidasteromella sepulta* (S-F56756, holotype). a Details of herbarium material. b, c Habit and appearance of ascomata on host surface. d Section of ascoma. e Hamathecium. f–h Asci. i–l Ascospores. Scale bars: b = 2 mm, c = 1 mm, d = 50 µm, e, i–l = 10 µm, f–h = 20 µm.

layers, outer layer dark brown, inner layer hyaline, comprising cells of *textura angularis*. *Hamathecium* lacking pseudoparaphyses. *Asci* 27–34 µm × 13–23 µm ($\bar{x}$ = 30.5 × 17.8 µm, n = 10), 8-spored, bitunicate, fissitunicate, oblong or subglobose lacking a pedicel, apical region of asci usually with a thick opaque region and ocular chamber. *Ascospores* 15–16 µm × 4–5 µm ($\bar{x}$ = 16 × 5 µm, n = 10), overlapping bi-seriate, hyaline when immature, pale brown to dark brown at maturity, ellipsoidal to fusoid, 1-septate, strongly constricted at the septum, upper cell broader and shorter than lower cell, verrucose. Asexual morph: Undetermined.

Material examined – JAPAN, on the leaf of *Cinnamomum japonicum* (Lauraceae), November 1867, C. Wright (S-F56756, holotype).

Economic significance – Species of *Dothidasteromella* appear to be members of sooty moulds and they coat fruits and leaves cursorily with black mycelia, which decreases photosynthesis rates of host plants (Chomnunti et al. 2014).

Botryosphaeriales C.L. Schoch, Crous & Shoemaker

Botryosphaeriaceae Theiss. & Syd. 1918

Gibberidea Fuckel, Jb. nassau. Ver. Naturk. 23-24: 168 (1870) [1869-70]

= *Sphaeropsis* Sacc., Michelia 2(no. 6): 105 (1880)

Saprobic or *pathogenic* on stem. Sexual morph: See Phillips et al. (2013). Asexual morph: *Conidiomata* immersed to semi-immersed, unilocular, subglobose. *Peridium* composed of dark brown cells of *textura angularis*. *Paraphyses* hyaline, aseptate, up to 50 µm long and 2 µm wide, with a bulbous tip 5 µm diam. *Conidiogenous cells* enteroblastic, hyaline, discrete proliferating internally to form periclinal thickenings. *Conidia* oval, apex obtuse to rounded, base obtuse or truncate, moderately thick-walled, initially hyaline, becoming brown, externally smooth-walled, internally finely verruculose-walled.

Type species – *Gibberidea visci* Fuckel

Notes – The genus *Gibberidea* was introduced as a monotypic genus by Fuckel (1870). The genus *Gibberidea* is given as a synonym of *Botryosphaeria* Ces. & De Not. in Index Fungorum (2019). Wijayawardene et al. (2017) placed *Gibberidea* in Dothideomycetes, genera *incertae sedis*. We could not examine the type material, but studied a specimen of *Gibberidea visci* from ILL herbarium. Based on morphology, it seems that the genus *Gibberidea* is a synonym of *Sphaeropsis* (Phillips et al. 2008, 2013). Phillips et al. (2013) considered *Phaeobotryosphaeria* as a synonym of *Sphaeropsis* and the older name *Sphaeropsis* is used based on the one fungus-one name concept. The genus *Gibberidea* is characterized by immersed to semi-immersed conidiomata and hyaline to brown ascospores. It seems clear that the genus *Gibberidea* should be placed in Botryosphaeriaceae and is a synonym of *Sphaeropsis.* In our analyses (Fig. 2), the strains *Phaeobotryosphaeria visci* CBS 186.97 and CBS 100163 cluster in Botryosphaeriaceae. We therefore, agree with Phillips et al. (2008) and exclude *Gibberidea* from Dothideomycetes genera *incertae sedis*.

Gibberidea visci Fuckel, Jb. nassau. Ver. Naturk. 23-24: 168 (1870) [1869-70] Fig. 3

Current name: *Phaeobotryosphaeria visci* (Kalchbr.) A.J.L. Phillips & Crous, in Phillips, Alves, Pennycook, Johnston, Ramaley, Akulov & Crous, Persoonia 21: 47 (2008)

Index Fungorum number: IF 227688; Facesoffungi number: FoF 06243

Saprobic or *pathogenic* on undetermined plant stem. Sexual morph: See Phillips et al. (2013). Asexual morph: *Conidiomata* 290–397 µm high × 422−454 µm diam. ($\bar{x}$ = 327.3 × 444.8 µm, n = 10), immersed to erumpent, unilocular, subglobose. *Peridium* 33−55 µm composed of dark brown cells of *textura angularis*. *Conidiogenous cells* 4–13 µm × 7−14 µm ($\bar{x}$ = 8.5 × 10.8 µm, n = 10), hyaline, enteroblastic, discrete, proliferating internally to form periclinal thickenings. *Conidia* 34–43 µm × 14−17 µm ($\bar{x}$ = 40.1 × 16.7 µm, n = 10), oval, apex obtuse to rounded, base obtuse or truncate, moderately thick-walled, initially hyaline, becoming brown, externally smooth-walled, internally finely verruculose.

Notes – Phillips et al. (2008) recorded the size of conidiomata of *Sphaeropsis visci* as ‘up to 300 µm’, conidiogenous cells as ‘(4–) 8.5–11× 4–6.5 µm’ and conidia as ‘(27–29–33(–50) × (14.5–

) 15.5–19(–22) µm' which is similar to our examined specimen.

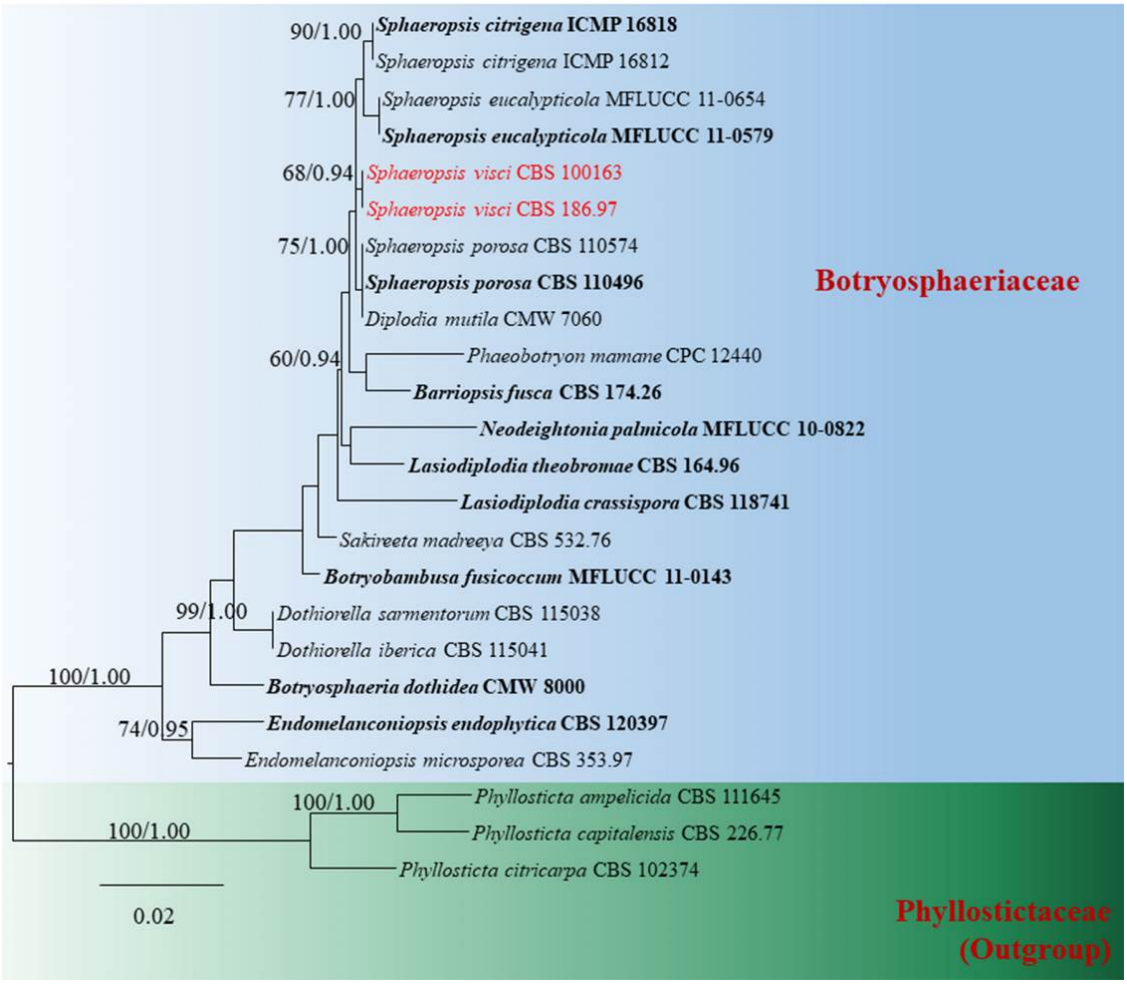

Figure 2 – Phylogram generated from maximum likelihood analysis based on LSU sequence data retrieved from the GenBank. Related sequences were retrieved from Liu et al. (2017). Twenty four taxa are included in the analyses which comprise 965 characters after alignment. *Phyllosticta ampelicida*, *Phyllosticta capitalensis* and *Phyllosticta citricarpa* are used as the out-group taxa. Maximum likelihood (ML) analysis was conducted in the CIPRES Science Gateway V. 3.3. The best sorting RaXML tree with a final likelihood value of -2440.002151 is presented. Estimated base frequencies were as follows: A = 0.255123, C = 0.215800, G = 0.310407, T = 0.218670; substitution rates AC = 1.413575, AG = 4.032008, AT = 1.495545, CG = 0.857086, CT = 13.775815, GT = 1.000000; gamma distribution shape parameter α = 0.020000; proportion of invariant 0.246495. ML bootstrap values ≥ 50% are given as the first set of numbers and approximate likelihood-ratio test (aLRT) ≥ 0.90 values as the second set of numbers above the nodes. Voucher/strain numbers are given after the taxon names, the one from type material are indicated in bold face. Sequence of interest is indicated in red. The bar length indicates the number of nucleotide substitutions per site.

Material examined – GERMANY, Saxony, on submerged decaying leaves, 7 November 1965, J.L. Crane (ILL00088985).

Economic significance – *Sphaeropsis visci* is a pathogen of *Viscum album* (mistletoe) (Varga et al. 2012).

Capnodiales Woron.
Antennulariellaceae Woron
Eumela Syd., Annls mycol. 23(3/6): 335 (1925)

Parasitic on living leaves of *Chiococca racemosa*, colonies large, superficial, irregular, black, with superficial mycelium forming a network, hypophyllous, dark brown outwardly. Sexual morph: *Ascomata* sessile, small, superficial, solitary, scattered, globose to subglobose, black, papillate, surrounded by brown to dark brown appendaged, undulate hyphae, branched, septate. *Peridium* comprising brown cells of *textura angularis* to *subglobosa*, lacking pseudoparaphyses. *Hairy hyphae* longer than 100 µm, pale brown to dark brown, simple, unbranched, numerous, straight or curved, septate, gradually paler upwards, flexuous, slightly constricted at the septa, apex rounded. *Asci* 8-spored, bitunicate, broadly clavate, cylindrical to nearly ellipsoidal, sessile, slightly thickened and bluntly rounded near the apex. *Ascospores* multi-seriate, overlapping, oblong to ovoid oblong, ends rounded, 1-septate, slightly constricted at the septum, hyaline, smooth-walled. Asexual morph: Undetermined.

Type species – *Eumela chiococcae* Syd.

Notes – The monotypic genus *Eumela* was introduced by Sydow (1925) for *Eumela chiococcae* found on living leaves of *Chiococca racemosa* in Costa Rica. *Eumela* is closely associated to *Episphaerella* Petr., *Eudimeriolum* Speg. and *Lasiostemma* Theiss. & Syd., but differs from these genera in having hyphae penetrating the epidermal cells, stromata as well as guard cells forming haustoria. The genus *Episphaerella* form extensive mycelium all over leaf tissues.

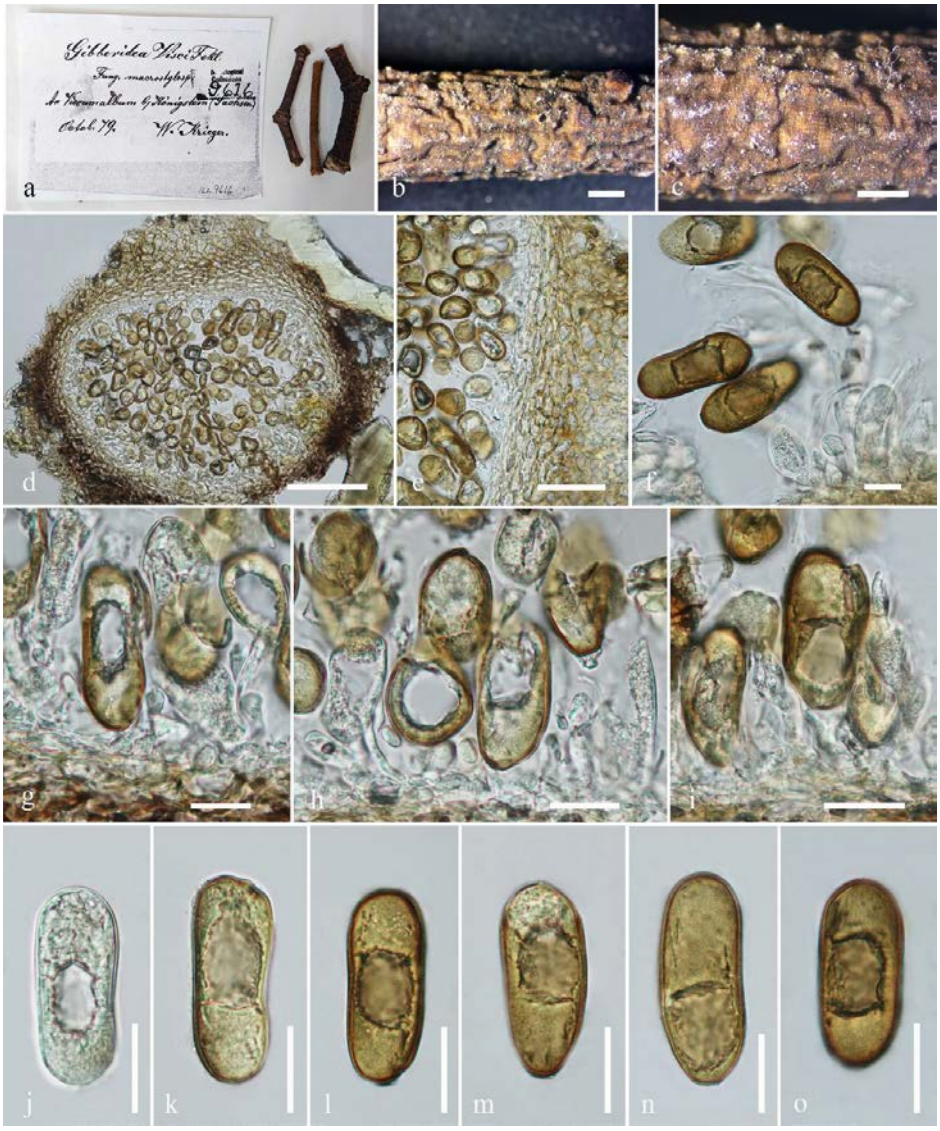

Figure 3 – *Gibberidea visci* (ILL 00088985) a, b Herbarium material. c Appearance of conidiomata on host surface. d Section of conidioma. e Peridium. f–i Conidiogenesis. j–o Conidia. Scale bars: b, c = 1 mm, d = 100 µm, e–o = 20 µm.

The hyphae of *Eudimeriolum* are totally superficial or penetrating trichomes. The hyphae of *Lasiostemma* form a discrete hyphal layer in or under the cuticle (Farr 1984, Barr 1987). The asexual morph is unknown. The genus *Eumela* was previously placed in Pseudoperisporiaceae (Lumbsch & Hundorf 2010, Hyde et al. 2013, Kirk et al. 2013). However, Boonmee et al. (2017) treated *Eumela* as a genus in Dothideomycetes genera *incertae sedis*. In this study, we examined the syntype of *Eumela chiococcae* and illustrate the morphological characters. It seems that species of *Eumela* resemble those of *Antennulariella*, by superficial subglobose to globose ascomata with hyphal appendages, aparaphysate hamathecium and clavate to ellipsoidal 8-spored asci. The genus *Eumela* is therefore transferred to Antennulariellaceae based on the sexual morph characters, numerous aerial mycelium colonies and ascospores features

Eumela chiococcae Syd., Annls mycol. 23(3/6): 335 (1925) Fig. 4

Index Fungorum number: IF 260515; Facesoffungi number: FoF 06241

Parasitic on living leaves of *Chiococca racemosa*, colonies large, superficial, irregular, black, with superficial mycelium forming a network, hypophyllous, dark brown outwardly. Sexual morph: *Ascomata* 50–85 μm high × 73–75 μm diam, sessile, small, superficial, solitary, scattered, globose to subglobose, black, papillate, surrounded by brown to dark brown, undulate hyphae, longer than 100 μm, branched, septate. *Peridium* comprising brown cells of *textura angularis* to *subglobosa*, lacking pseudoparaphyses. *Hairy peridial hyphae* longer than 100 μm, pale brown to dark brown, simple, unbranched, numerous, straight or curved, septate, gradually paler upwards, flexuous, slightly constricted at the septa, apex rounded. *Asci* 12–17 μm × 7–8 μm ($\bar{x}$ = 15.7 × 8.0 μm, n = 10), 8-spored, bitunicate, broadly clavate, cylindrical to nearly ellipsoidal, sessile, slightly thickened and bluntly rounded near the apex. *Ascospores* 10.0–10.5 μm × 2.5–3.0 μm ($\bar{x}$ = 10.3 × 2.8 μm, n = 10), multi-seriate, overlapping, oblong to ovoid oblong, ends rounded, 1-septate, slightly constricted at the septum, hyaline, smooth-walled. Asexual morph: Undetermined.

Material examined – COSTA RICA, Alajuela, Grecia, on living leaves of *Chiococca racemosa* L., (Rubiaceae), 19 January 1925, H. Sydow (S-F11419, syntype).

Economic significance – *Eumela chiococcae* are sooty moulds which form hyphae and colonies on leaf surfaces covering the entire leaves or plants. They are reported as plant disease agents because of their negative effects on photosynthesis. They block sunlight from leaf chloroplasts, thus reducing the plants' energy production (Nelson 2008, Chomnunti et al. 2014, Laemmlen 2011).

Dothideales Lindau

Dothideales, genus *incertae sedis*

Botryochora Torrend, Brotéria, sér. bot. 12(1): 65 (1914)

Saprobic on unidentified bark. Sexual morph: Undetermined. Asexual morph: *Stromata* superficial, scattered, broad, flattened turbinate, multiloculate, often supported by a stalk at the central point, collapsing when dry, with folded margin, black, coriaceous. *Conidiomata* pycnidial, multiloculate, immersed in stroma, brown to black, coriaceous. *Peridium* 1-layered, composed of black to brown cells of *textura angularis*. *Conidiophore*s macronematous, septate, unbranched, smooth, hyaline. *Conidiogenous cell*s enteroblastic, hyaline, funnel-like, integrated. *Conidia* oblong to ellipsoid, hyaline, aseptate, with granular cytoplasm, smooth-walled.

Type species – *Botryochora nigra* (Torrend) Torrend

Notes – The monotypic genus *Botryochora* was introduced by Torrend (1914) based on type species *Botryochora nigra* Torrend (≡ *Megalonectria nigra* Torrend) which was previously classified in Nectriaceae, Sordariomycetes. *Botryochora nigra* was found on unidentified bark of trees in Kisanty Congo, Mozambique. This genus was later placed in Dothioraceae by Hawksworth et al. (1995) and Lumbsch and Huhndorf (2010). The genus is characterized by superficial stromata with locules, 8-spored asci and smoky brown ascospores. The asexual morph as observed by Thambugala et al. (2014) is coelomycetous, who transferred the genus to *Dothideales*, genera *incertae sedis* based on morphology. We examined another specimen from S, but did not observe

any sexual morph of *Botryochora nigra*. Presently, we follow Thambugala et al. (2014) and place *Botryochora* in *Dothideales* genera *incertae sedis*.

Botryochora nigra (Torrend) Torrend, Brotéria, sér. bot. 12(1): 65 (1914) Fig. 5
≡ *Megalonectria nigra* Torrend, Bull. Jard. bot. État Brux. 4: 8 (1914)
Index Fungorum number: IF 293763; Facesoffungi number: FoF 06220

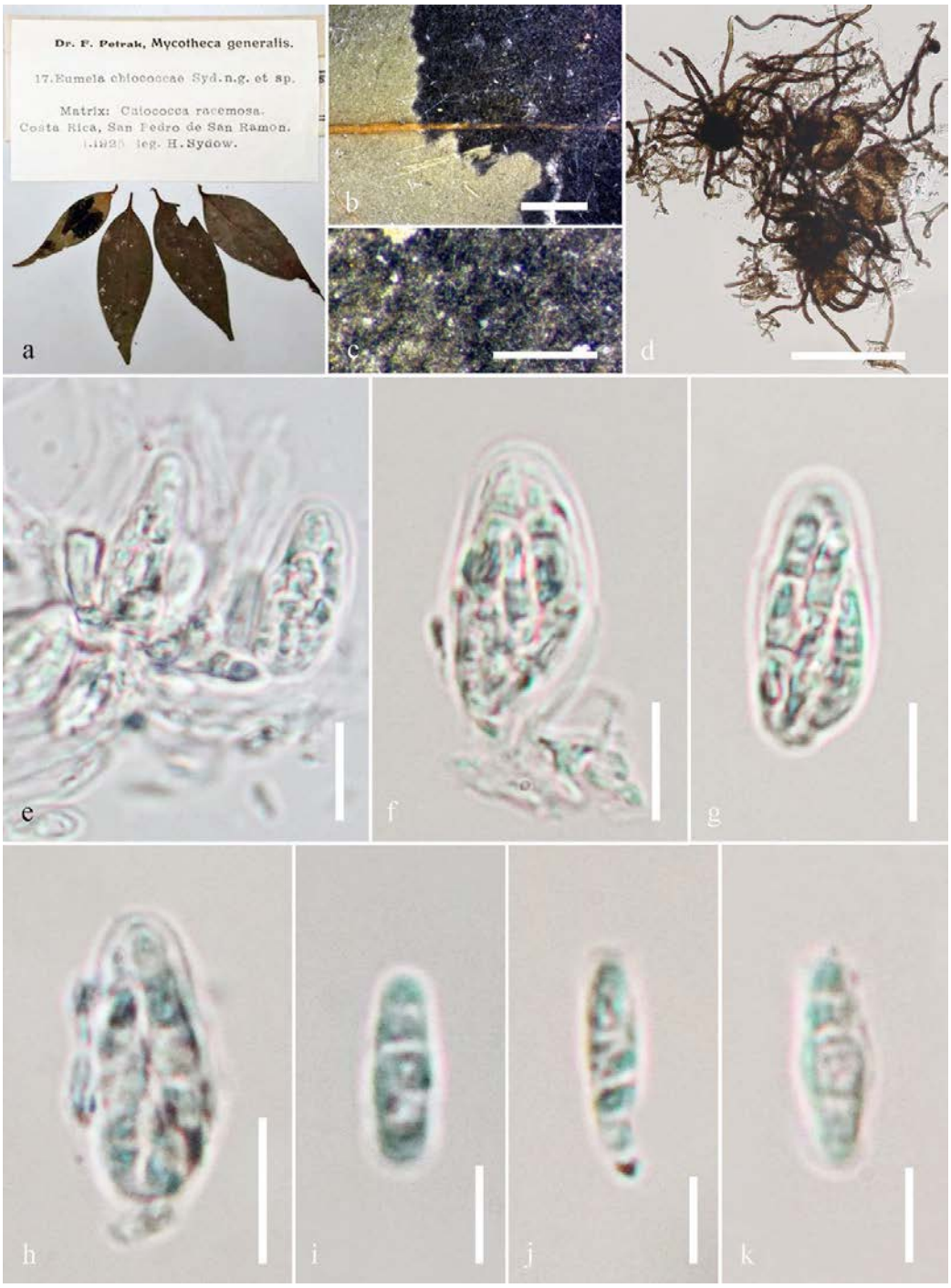

Figure 4 – *Eumela chiococcae* (S-F11419, syntype). a Details of herbarium material. b, c Habit and appearance of ascomata on host surface. d Squash mount of ascoma, peridium and mycelia. e–h Asci. i–k Ascospores. Scale bars: b, c = 500 µm, d = 100 µm, e–h = 10 µm, i–k = 5 µm.

Saprobic on unidentified bark. Sexual morph: Undetermined. Asexual morph: *Stromata* 940–964 µm high × 1558–1675 µm diam. ($\bar{x}$ = 1616.8 × 951.6 µm, n = 5), superficial, scattered, broad,

flattened turbinate, multiloculate with 3–5 locules, often supported by a stalk at the central point, collapsed when dry, with folded margin, black, coriaceous. *Conidiomata* 98–368 µm high × 112–363 µm wide ($\bar{x}$ = 270.6 × 272.7 µm, n = 8), immersed in stromata, brown to black, coriaceous. *Peridium* one layer, 3–4 µm wide, composed of black to brown cells of *textura angularis*. *Conidiophore*s 12–17 µm × 3–4 µm ($\bar{x}$ = 13.4 × 3.7 µm, n = 20), septate, unbranched, hyaline. *Conidiogenous cell*s enteroblastic, hyaline, with funnel-like collarette, integrated. *Conidia* 36–41 µm × 23–26 µm ($\bar{x}$ = 37.2 × 25.5 µm, n = 20), hyaline, unicellular, ellipsoid, with granular cytoplasm, smooth walled.

Material examined – MOZAMBIQUE, Zumbo, on unidentified bark, May 1913, A. Cruz (S-F49313).

Economic significance – The asexual genus *Botryochora* consists of species that cause numerous leaf spot diseases on some plants (Clements 1931).

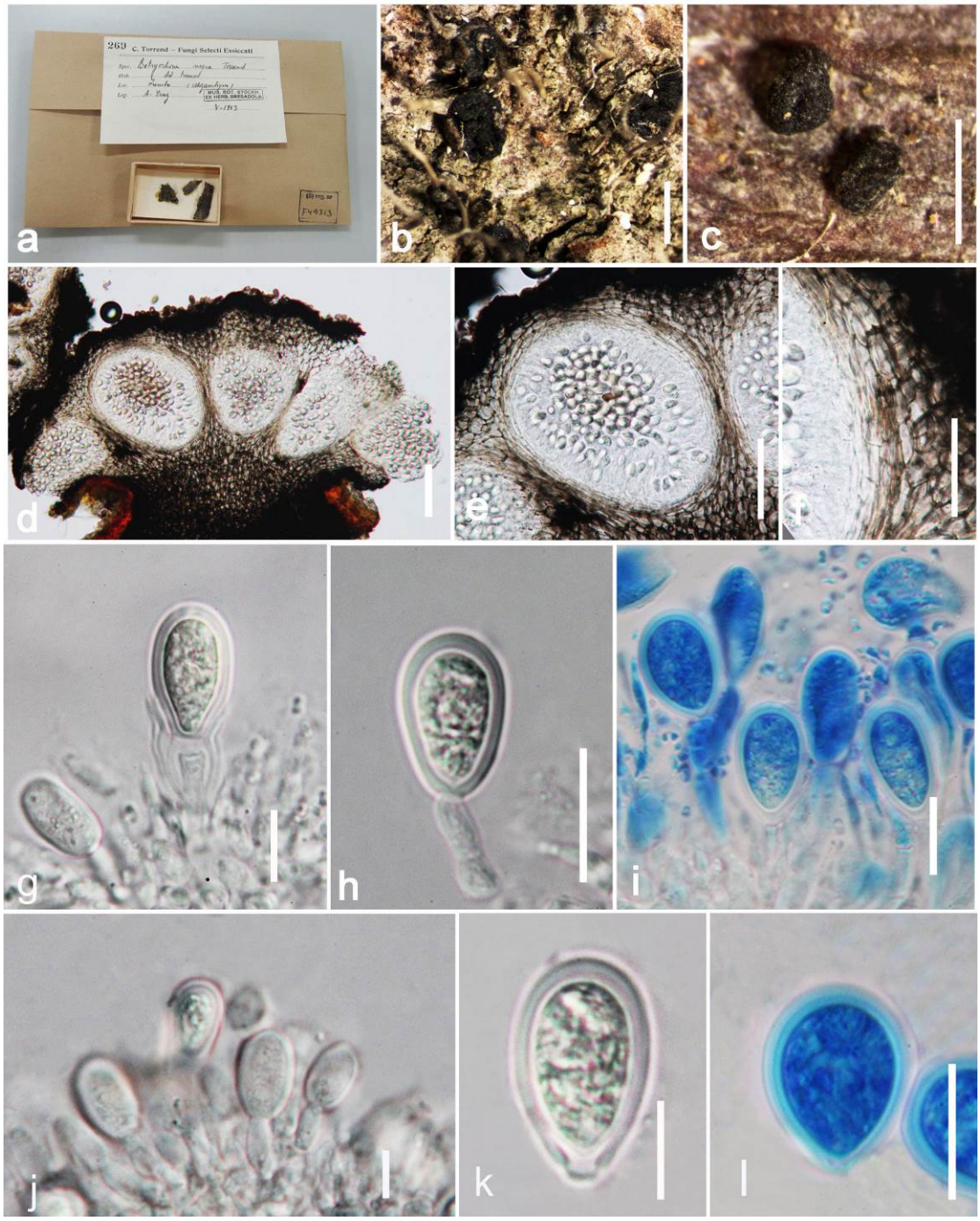

Figure 5 – *Botryochora nigra* (S-F49313). a–c Herbarium specimen and habit on substrate. d, e Section of conidiomata. f Peridium. g–j Conidiogeneous cells. k, l Conidia. Scale bars: b, c = 1 mm, d, e = 100 μm, f = 5 μm, g, j, k = 20 μm, h, i, l = 40 μm.

Pleosporales Luttr. ex M.E. Barr

Dothidotthiaceae Crous & A.J.L. Phillips

Belizeana Kohlm. & Volkm.-Kohlm., Bot. Mar. 30(3): 195 (1987)

Pathogenic or *saprobic* on *Laguncularia* sp. Sexual morph: *Ascomata* solitary, scattered, or clustered or somewhat gregarious, erumpent, subglobose, medium-sized, dark brown to black, pale brown on the sides, ostiolate, epapillate or shortly papillate. *Peridium* comprising a few layers of thin-walled cells of *textura angularis*, hyaline towards the inside, basal region giving rise to hyaline hyphal mass producing asci. *Hamathecium* of dense, ca. 2 μm broad, filliform pseudoparaphyses, rarely branched, embedded in gelatinous matrix. *Asci* 8-spored, bitunicate, fissitunicate, broadly cylindrical to clavate, with a short pedicel, thick-walled, rounded at apex, with an ocular chamber. *Ascospores* uniseriate, partially overlapping, broadly ellipsoidal, hyaline when immature, pale brown to chestnut when mature, 1-septate, constricted at the septum, thick-walled, 2-layered, mature spores with tuberculate ornamentation between the two layers. Asexual morph: undetermined.

Type species – *Belizeana tuberculata* Kohlm. & Volkm.-Kohlm.

Notes – The monotypic genus *Belizeana* was introduced by Kohlmeyer & Volkmann-Kohlmeyer (1987) with *Belizeana tuberculata* as type species. The genus is characterized by distinct subglobose to ampulliform ascomata, eight-spored, cylindrical asci and one-septate, thick, walled, pale brown ascospores. *Belizeana* was previously accommodated in Pleosporaceae by Volkmann-Kohlmeyer (1987). Later, it was transferred to *Elsinoaceae* by Lumbsch & Huhndorf (2010). Recently, *Belizeana* was accepted as a genus in Dothideales *incertae sedis* (Jones et al. 2015). The asexual morph is coelomycetes (Kohlmeyer & Volkmann-Kohlmeyer 1987). Cultures and sequences are unavailable for the type species. We re-examined the type specimen of *B. tuberculata* from IMS under no. 4209 and found comparable morphological characters to *Dothidotthia symphoricarpi*, such as subglobose, dark brown to black ascomata, clavate to cylindrical asci and 1-septate, ellipsoidal, pale brown ascospores. Based on morphological characters, we transfer the genus *Belizeana* to Dothidotthiaceae, Pleosporales.

Belizeana tuberculata Kohlm. & Volkm.-Kohlm., Bot. Mar. 30(3): 196 (1987) Fig. 6

Index Fungorum number: IF 130737; Facesoffungi number: FoF 06219

Pathogenic or *saprobic* on *Laguncularia* sp. Sexual morph: *Ascomata* 165–310 μm high × 155–295 μm diam., solitary, scattered, or clustered or somewhat gregarious, erumpent, subglobose, medium-sized, dark brown to black, pale brown on the sides, ostiolate, epapillate or shortly papillate. *Peridium* 25–35 μm wide, comprising a few layers of thin-walled cells of *textura angularis*, hyaline towards the inside, basal region giving rise to hyaline hyphal mass producing asci. *Hamathecium* of dense, ca. 2 μm broad, filliform pseudoparaphyses, rarely branched, embedded in gelatinous matrix. *Asci* 135–160 μm × 20–30 μm ($\bar{x}$ = 163 × 25 μm, n = 10), 8-spored, bitunicate, fissitunicate, broadly cylindrical to clavate with a short pedicel, thick-walled, rounded at apex with an ocular chamber. *Ascospores* 21–26 μm × 13–18 μm ($\bar{x}$ = 22 × 15 μm, n = 10), uniseriate, partially overlapping, broadly ellipsoidal, hyaline when immature, pale brown to chestnut when mature, 1-septate, constricted at the septum, thick-walled, 2-layered, mature spores.

Material examined – AUSTRALIA, New South Wales, Towra Point, Botany Bay, trunk of eroded tree with oysters and shipworms, intertidal zone, 23 August 1981, L. Kohlmeyer (IMS Herb. J. Kohlmeyer No. 4209, paratype).

Economic significance – The genus *Belizeana* comprises marine fungi and was reported to cause leaf spots and diseases of *Rhizophora mucronata* (Rhizophoraceae) (Ossler 2010).

Lophiotremataceae K. Hiray. & Kaz. Tanaka

Koordersiella Höhn., Sber. Akad. Wiss. Wien, Math.-naturw. Kl., Abt. 1 118: 833 (1909**)**

Synonyms listed in Index Fungorum (2019), *Ascohansfordiellopsis* D. Hawksw., *Keratosphaera* H.B.P. Upadhyay, *Phanerococcus* Theiss. & P. Syd. (not confirmed in this study).

Saprobic on leaves of *Urostigma vogelii* Miq. Sexual morph: *Ascomata* regular, small, subglobose to globose, scattered, slightly carbonaceous. *Peridium* thick, carbonaceous. *Hamathecium* numerous, filamentous, septate, branched, anastomosing, trabeculate pseudoparaphyses. *Asci* 8-spored, fissitunicate, cylindrical to clavate, with a short pedicel or sessile, rounded at the apex, with an ocular chamber. *Ascospores* bi or tri-seriate, straight or slightly curved, fusiform to cylindrical, spindle-shaped, and rounded at both ends or slightly pointed, 4–8 celled, multi-septate, hyaline, without a gelatinous sheath. Asexual morph: Undetermined.

Type species – *Koordersiella javanica* Höhn.

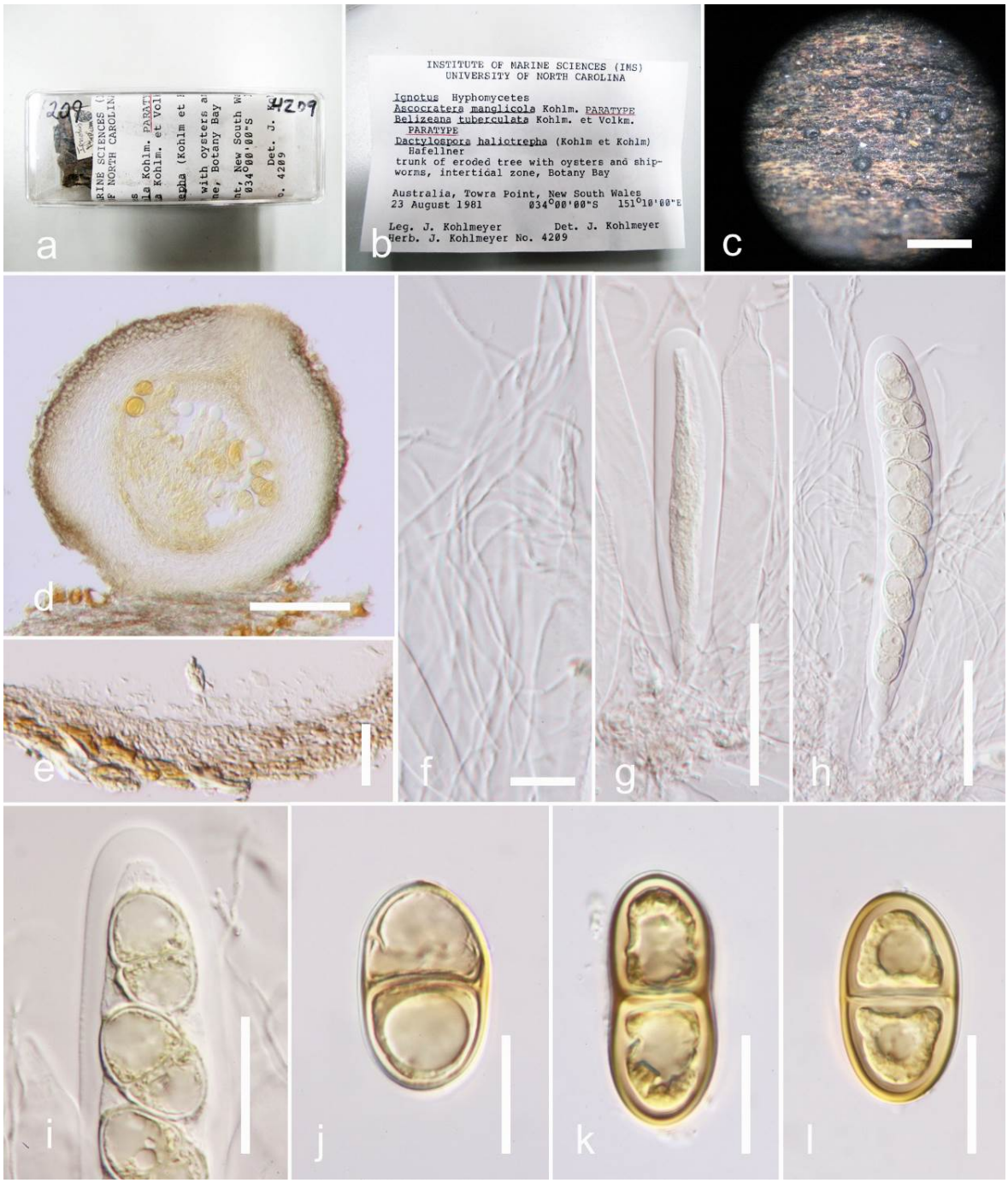

Figure 6 – *Belizeana tuberculata* (IMS from Herb. J. Kohlmeyer No. 4209, paratype) a–c Herbarium specimen and habit on substrate. d Section of an ascoma. e Peridium f Hamathecium. g–

h Asci. i Ocular chamber. j–l Ascospores. Scale bars: c = 1 mm, d, g, h = 100 µm, e, f = 20 µm, , i = 50 µm, j–l = 10 µm.

Notes – The lichenicolous genus *Koordersiella* was introduced by Höhnel (1909) to accommodate type species *Koordersiella javanica*. The latter was found on leaves of *Urostigma vogelii* Miq. in Java. The genus is characterized by regular, small black perithecia, with a multi-layered perithecial wall. Asci are thin-walled, sessile consisting of four to eight spores. *Ascospores* are hyaline, cylindric spindle-shaped. Hawksworth (2016) considered the type species of *Koordersiella*, *K. javanica*, and the type species of *Hansfordiellopsis*, *H. aburiensis* (now regarded as a synonym of *K. insectivora*), to be congeneric. Currently, three species are accommodated in the genus *Koordersiella* (Wijayawardene et al. 2014). The asexual morph is unknown. *Koordersiella* was placed in Dothideomycetes genera *incertae sedis* (Lumbsch & Huhndorf 2010, Kirk et al. 2013, Rossman et al. 2016). Cultures and sequences are unavailable. We illustrate the characters of the genus *Koordersiella* by re-examining the type specimen under the code FH 00301501 from FH herbarium. The type species of *Koordersiella* seems to resemble species of Lophiotremataceae in having small ascomata, clavate asci, and several septate hyaline ascospores. Thus, we tentatively place the genus *Koordersiella* in Lophiotremataceae based on morphology until further re-collected.

Koordersiella javanica Höhn., Sber. Akad. Wiss. Wien, Math.-naturw. Kl., Abt. 1 118: 833 (1909) Fig. 7

Index Fungorum number: IF 174412; Facesoffungi number: FoF 06248

Saprobic on leaves of *Urostigma vogelii*. Sexual morph: *Ascomata* 19–29 µm high × 28–30 µm diam. ($\bar{x}$ = 23.7 × 29.3 µm, n = 20), regular, small, subglobose to globose, scattered, slightly carbonaceous. *Peridium* thick, carbonaceous and could not be observed. Hamathecium of filamentous, numerous, septate, branched, anastomosing trabeculate pseudoparaphyses. *Asci* 83–95 µm × 14–16 µm ($\bar{x}$ = 89.4 × 15.7 µm, n = 20), 8-spored, fissitunicate, cylindrical to clavate, with a short pedicel or sessile, rounded at the apex, with an ocular chamber. *Ascospores* 18–20 µm × 3–5 µm ($\bar{x}$ = 19.7 × 4.2 µm, n = 20), 2 or 3-seriate, straight or slightly curved, fusiform to cylindrical, spindle-shaped, and rounded at both ends or slightly pointed, 4–8 celled, multi-septate, hyaline, without a gelatinous sheath. Asexual morph: Undetermined.

Notes – The perithecial wall of *Koordersiella javanica* could not be observed from the specimen that we studied. However, from the original description, the peridium is described as 'having a thickness of 20 to 25 µm on the top and 15 µm below, laterally 40 to 45 µm, multi layered with the inner layer comprising hyaline cells of *textura angularis*'. The perithecia are usually located on a very delicate, circular, different broad basal membrane (Hypothallus), which consists of thin delicate hyphae (Fig. 7).

Material examined – JAVA, Kulturtuin of Tjeukemeer near Buitenzorg, on leaves of *Urostigma vogelii* (Moraceae), 1 January 1993, F. Höhnel (FH 00301652, holotype).

Economic significance – None has been reported.

Massarinaceae Munk

Byssothecium Fuckel, Bot. Ztg. 19(no. 35): 251 (1861)

Saprobic or *parasitic* on *Medicaginis sativae*. Sexual morph: *Ascomata* pseudothecioid solitary, scattered, or in groups, immersed, semi-immersed to erumpent, globose to subglobose, black, apex with a short papilla. *Peridium* coriaceous, consisting of thick-walled, brown cells of *textura angularis*. *Hamathecium* composed of pseudoparaphyses, embedded in mucilage, branching, septate and anastomosing between and above the asci. *Asci* 8-spored, bitunicate, fissitunicate, cylindro-clavate, slightly curved when immature, pedicellate. *Ascospores* biseriate to uniseriate, fusiform, hyaline when immature, dark brown at maturity, 3- trans-septate, and variously ornamented. Asexual morph: Undetermined.

Type species – *Byssothecium circinans* Fuckel

Notes – The genus *Byssothecium* was introduced by Fuckel (1861) with the type species *B. circinans*. The latter was described as a saprobe or parasite of *Medicago sativa* (Semeniuk 1983) and a *Pleospora*-type centrum was observed (Boise 1983). A *chaetophoma*-like anamorph is reported in culture, however, no culture or herbarium specimen is listed (Boise 1983). *Byssothecium* was considered as closely related to *Teichospora* (Boise 1983). Later, it was accepted as a genus in Massarinaceae by Zhang et al. (2009). Some studies showed that *Byssothecium* was distinct from Massarinaceae and was placed in Dothideomycetes genera *incertae sedis* (Lumbsch & Huhndorf 2010, Wijayawardene et al. 2014). However, in the phylogenetic analysis done by Chethana et al. (2015) and Thambugala et al. (2015), *Byssothecium* clustered in Massarinaceae. Currently, the genus consists of eight species (Index fungorum 2019). The asexual morph is coelomycetous (Wijayawardene et al. 2017). Cultures and sequences are available for *B. circinans* however, it could not be accommodated in any family so far (Wijayawardene et al. 2018). We examined the isotype specimen of *B. circinans* and according to morphological characters, *B. circinans* share morphological similarities to species in Trematosphaeriaceae such as subglobose, black, coriaceous ascomata, thick-walled cells of *textura angularis*, septate, cellular pseudoparaphyses, embedded in mucilage, branching and anastomosing between and above the asci, cylindric-clavate bitunicate asci and brown fusiform ascospores. But, based on a megablast search using the LSU sequence of *Byssothecium circinans*, the closest matches in NCBI's GenBank nucleotide database were *Helminthosporium juglandinum* (L97), *Helminthosporium juglandinum* (L118), *Helminthosporium juglandinum* (L101) with 100%, 99%, 99% similarities respectively with 0% gaps. Phylogenetic analyses of the putative strain of *Byssothecium circinans* (CBS 675.92) available in GenBank shows that *Byssothecium* forms a lineage basal to *Pseudodidymosphaeria spartii* (CBS 183.58) (Fig. 8). *Byssothecium* resembles *Pseudodidymosphaeria* in having semi-immersed ascomata, however, it differs from other morphological characters. The genus *Byssothecium* rather resembles species of *Pseudosplanchonema* in having pseudothecioid ascomata and cylindro-clavate asci but differs in ascospores characters (3- trans-septate vs 1-sub-median septate, pseudosepta between the guttules). We therefore, place *Byssothecium* in Massarinaceae.

Byssothecium circinans Fuckel, Bot. Ztg.19 (no. 35): 251 (1861) Fig. 9

Index Fungorum number: IF 165669; Facesoffungi number: FoF 06226

Saprobic or *parasitic* on *Medicaginis sativae*. Sexual morph: *Ascomata* pseudothecioid 250–350 μm high, 200–300 μm diam. ($\bar{x}$ = 256.3 × 260.2 μm, n = 10), solitary, scattered, or in groups, immersed, semi-immersed to erumpent, globose to subglobose, black, apex with a short papilla. *Peridium* 16–40 μm wide, coriaceous, consisting of thick-walled, brown cells of *textura angularis*. *Hamathecium* 2–5 μm wide comprises pseudoparaphyses, embedded in mucilage, branching, septate and anastomosing between and above the asci. *Asci* 54–69 μm × 8–13 μm ($\bar{x}$ = 61.3 × 11.3 μm, n = 10), 8-spored, bitunicate, fissitunicate, cylindro-clavate, slightly curved when immature, pedicellate. *Ascospores* 35–44 μm × 12–16 μm ($\bar{x}$ = 41.2 × 14.5 μm, n = 10), uni- to bi-seriate, fusiform, hyaline when immature, dark brown at maturity, trans-septate and variously ornamented. Asexual morph: undetermined.

Material examined – GERMANY, Europe, F. rhen. 730c, on *Medicago sativa* (Fabaceae), Fuckel, (B70 0014084, isotype); Fungi rhenani 730 (G-K 18364); Herbier Boissier 339 (G-K 18366); F. sel, exs. 259, on *Medicago sativa* (Fabaceae) (G-K 18367).

Economic significance – The genus *Byssothecium* has been reported to cause leaf spots on *Quercus* sp. (Fagaceae) in Iran (Pourmoghaddam et al. 2015).

Pleosporaceae Nitschke

Gibbago E.G. Simmons, Mycotaxon 27: 108 (1986)

Saprobic or *pathogenic* on leaves and wood. Sexual morph: Undetermined. Asexual morph: *Conidiophores* straight or curved, mostly unbranched or rarely branched, pale brown, septate and solitary or 2–4 loosely fasciculate, erect, simple with a single apical conidiogenous locus which proliferate by means of a secondary conidiophore that arises immediately below the

apical cell of the existing conidiophore, septate, slightly pigmented. *Conidiogenous cells* swollen at the apex, holoblastic, polyblastic, sympodial, hyaline to medium or dark brown, with occasionally 1–5 apical proliferations. *Conidia* formed singly at the tip of conidiogenous cell, sometimes catenate, pale to dark brown with the densely pustular wall, mostly ovoid to oblong, rounded at the base and round to conical at the apex, initially solitary, ellipsoid, beakless, pigmented, becoming transversely and longitudinal septate, with apical cells swelling slightly and producing secondary conidia similar to initial ones with distinct constriction at the median septum (Simmons 1986).

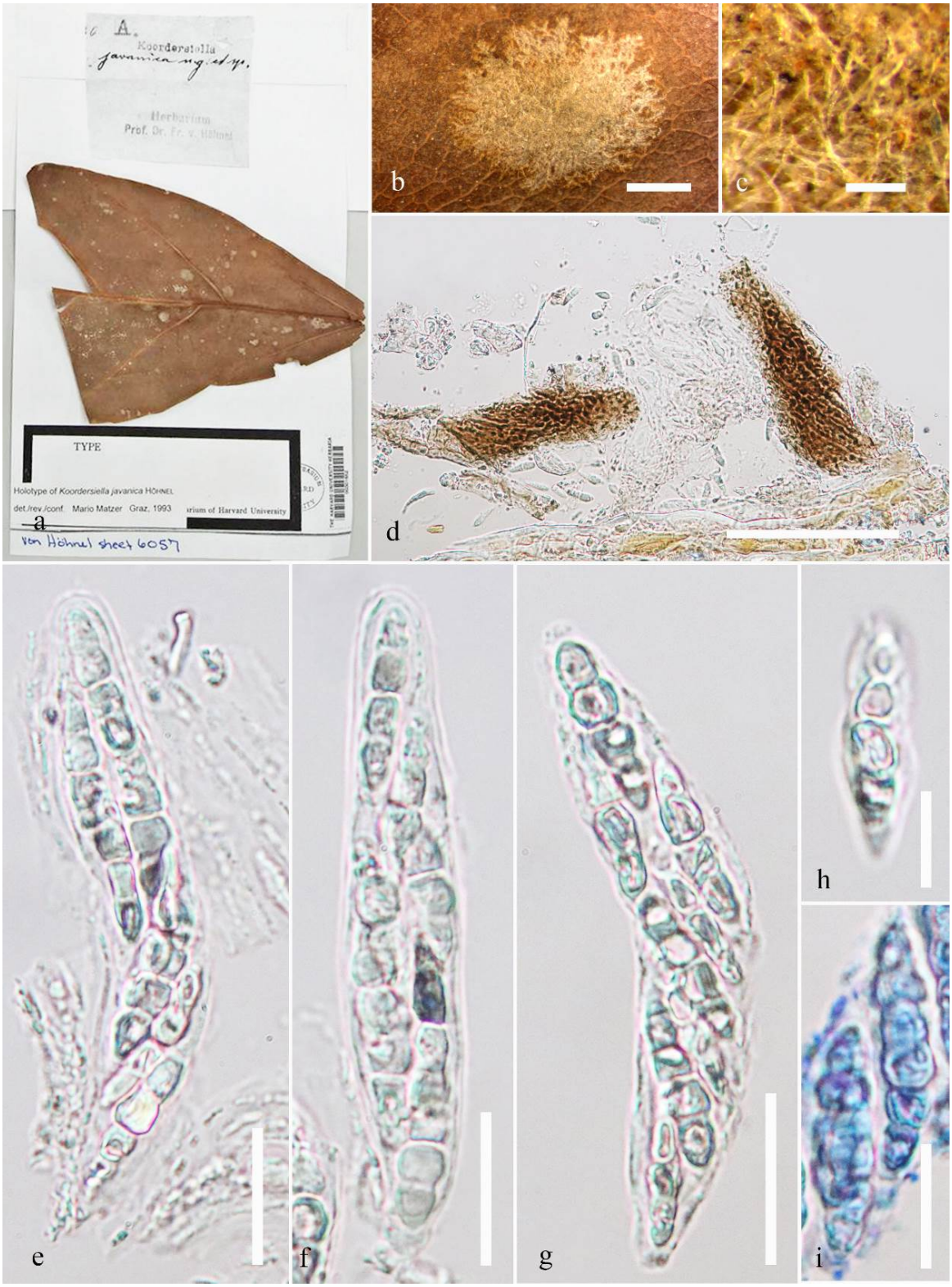

Figure 7 – *Koordersiella javanica* (FH 00301652, holotype). a Details of herbarium material. b, c Habit and appearance of ascomata on host surface. d Section of ascoma. e–g Asci. h, i Ascospores. Scale bars: b = 500 µm, c = 200 µm, d = 50 µm, e–g = 20 µm, h, i = 10 µm.

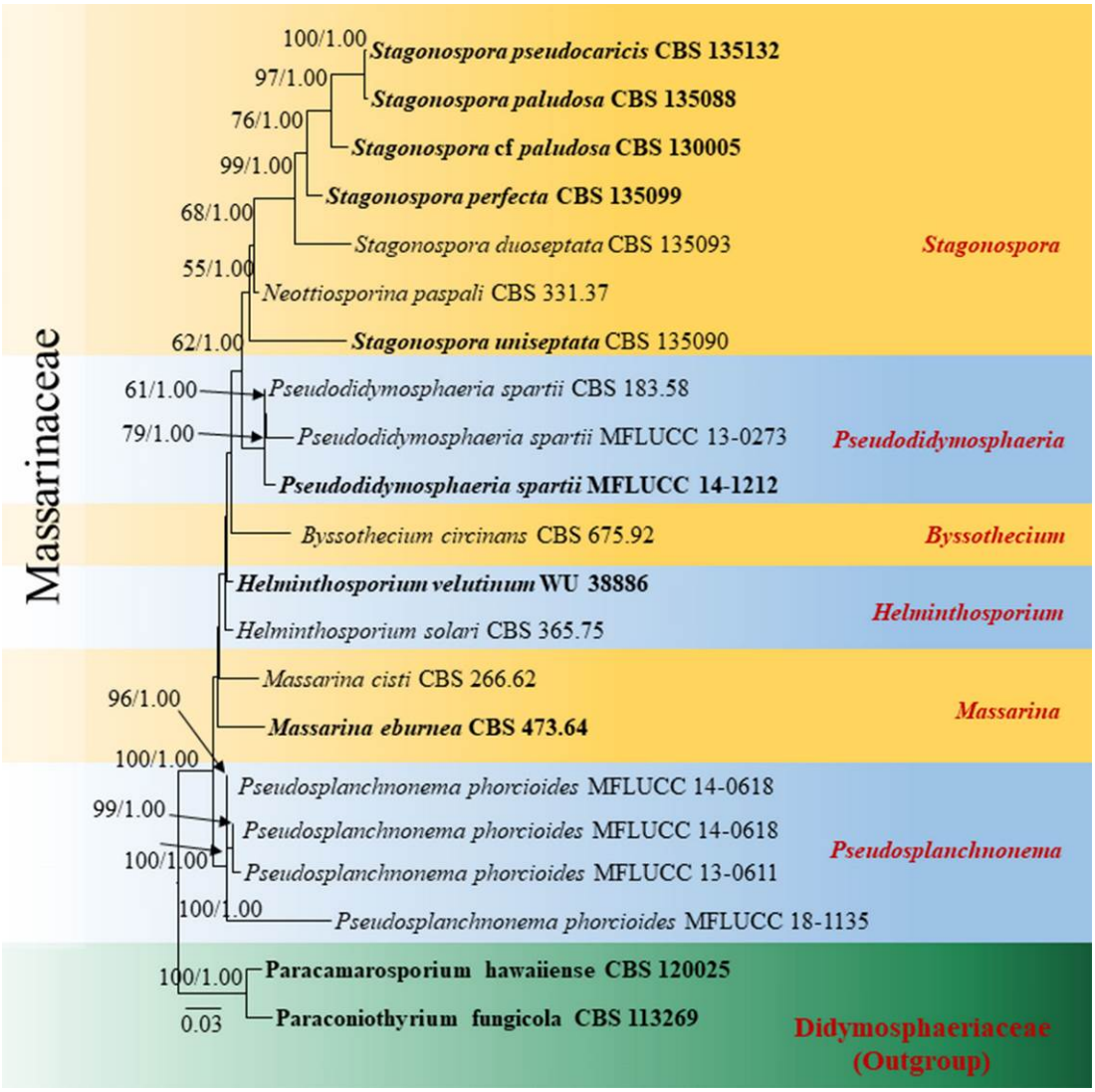

Figure 8 – Phylogram generated from maximum likelihood analysis based on combined LSU, SSU and BTUB sequence data. Related sequences were retrived from Liu et al. (2017). Twenty-one strains are included in the combined gene analyses comprising 2327 characters after alignment (856 characters for LSU, 1058 characters for SSU and 411 characters for BTUB). *Paracamarosporium hawaiiense* (CBS 120025) and *Paraconiothyrium fungicola* (CBS 113269) are used as the outgroup taxon. The tree topology of the Bayesian analysis was similar to the maximum likelihood analysis. The best RaxML tree with a final likelihood value of -7593.818950 is presented. The matrix had 535 distinct alignment patterns, with 30.91% undetermined characters or gaps. Estimated base frequencies were as follows: A = 0.254460, C = 0.214516, G = 0.284400, T = 0.246625; substitution rates AC = 1.248767, AG = 2.513663, AT = 1.269748, CG = 0.839642, CT = 4.977442, GT = 1.000000; gamma distribution shape parameter α = 0.917153. Bootstrap values for maximum likelihood equal to or greater than 50 and Bayesian posterior probabilities equal or greater than 0.95 are placed above or below the branches, respectively. Ex-type strains are in bold and black. The newly generated sequences are indicated in blue.

Type species – *Gibbago trianthemae* E.G. Simmons

Notes – The monotypic genus *Gibbago* was introduced by Simmons for the type species *Gibbago trianthemae.* The latter was isolated from leaves of *Trianthema portulacastrum.* The

genus is characterized by loosely fasciculate, erect conidiophores, polyblastic, sympodial conidiogenous cells and ellipsoid, beakless, transversely and longitudinally septate brown conidia. Its sexual morph has never been reported. We have re-studied the isotype specimen of *Gibbago trianthemae* under the code NY00945973.

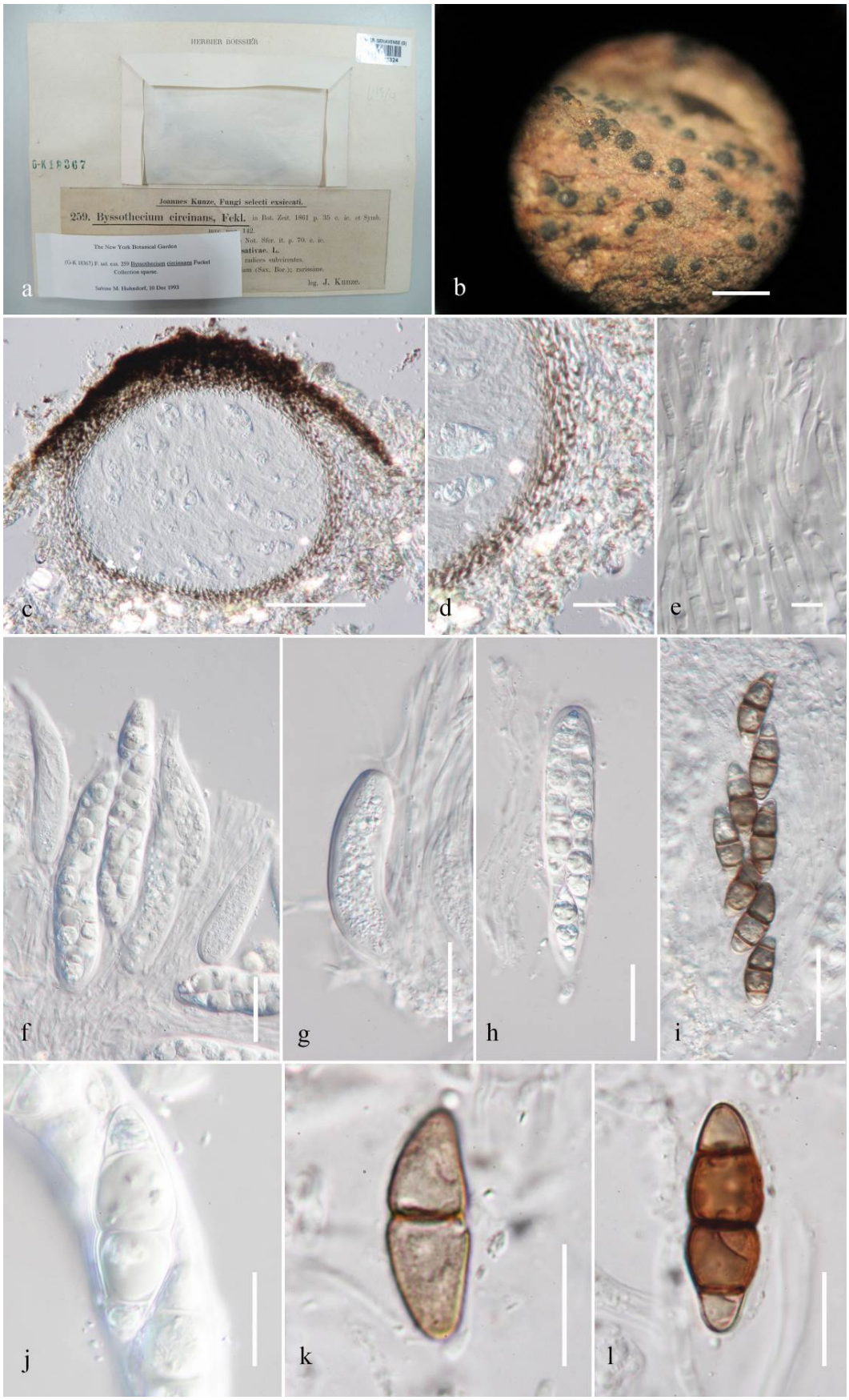

Figure 9 – *Byssothecium circinans* (G-K 18367) a, b Herbarium specimen and habit on host. c Section of ascoma. d Peridium. e Hamathecium. f Asci embedded in pseudoparaphyses. g–i Asci. j–l Ascospores. Scale bars: b = 500 μm, c = 100 μm, d, e, g, j–l = 20 μm, f, h–i = 50 μm.

The genus *Gibbago* was accommodated in Pleosporaceae by Simmons (1986) based on its morphological similarities with the genus *Alternaria, Embellisia, Ulocladium* and *Stemphylium* and this was followed by Wijayawardene et al. (2014). Only ITS sequence data is available for the putative strains of *Gibbago trianthemae* GT-VM and NFCCI 1886. In a previous study by Ariyawansa et al. (2015b), the strains *Gibbago trianthemae* GT-VM and NFCCI 1886 formed a distinct lineage basal to *Paradendryphiella* and *Pleospora* with low boostrap support. In our study, after nucleotide blast using the Basic Local Alignment Search Tool, DNA sequence of strains of *Gibbago trianthemae* were highly similar to species in the family Pleosporaceae. In the phylogenetic analyses of the ITS sequences, the two strains *Gibbago trianthemae* GT-VM and NFCCI 1886 formed a independent clade basal to *Exserohilum* and *Setosphaeria* with moderate bootstrap support (Fig. 10). We therefore, transfer *Gibbago* to *Pleosporaceae* following Ariyawansa et al. (2015b).

Gibbago trianthemae E.G. Simmons, Mycotaxon 27: 108 (1986) Fig. 11, 12

Index Fungorum number: IF130298; Facesoffungi number: FoF00522

Saprobic or *pathogenic* on leaves and leaf stalks of *Trianthema portulacastrum* (Aizoaceae). Sexual morph: unknown. Asexual morph: *Conidiophores* 51–94 μm × 3–7 μm ($\bar{x}$ = 59.6 × 6.1 μm, n = 10), straight or curved, mostly unbranched or rarely branched, pale brown, septate and up to 80 μm in length, solitary or 2–4 loosely fasciculate, erect, simple with an apical conidiogenous locus which proliferates by means of a secondary conidiophore that arises immediately below the apical cell of the existing conidiophore, septate, slightly pigmented. *Conidiogenous cells* swollen at the apex and hyaline to medium or dark brown, polyblastic, sympodial, 6–8 μm in wide and occasionally 1–5 apical proliferations. *Conidia* 38–40 μm × 17–19 μm ($\bar{x}$ = 39.2 × 18.3 μm, n = 10), formed singly at the tip of conidiogenous cell, pale to dark brown with the densely pustular wall, mostly ovoid to oblong, rounded at the base and round to conical at the apex, initially solitary, sometimes becoming catenate, ellipsoid, beakless, pigmented, becoming transversely and longitudinal septate, with apical cells swelling slightly and producing secondary conidia similar to initial ones with distinct constriction at the median septum.

Material examined – NORTH AMERICA, USA, Brazos Co., Texas A. & M. Univ. Expt. Farm, on leaves and leaf stalks of *Trianthema portulacastrum* (Aizoaceae), 27 August 1967, E.G. Simmons (NY 00945973, isotype).

Economic significance – The fungus in the genus *Gibbago* is a fungal pathogen or bioherbicide against the weed horse purslane (*Trianthema portulacastrum* L.) (Akhtar 2013, Gandipilli & Kumar 2018).

Tetraplosphaeriaceae Kaz. Tanaka & K. Hiray.

Byssolophis Clem., in Clements & Shear, Gen. fung., Edn 2 (Minneapolis): 83, 286 (1931)

Saprobic on decaying wood. Sexual morph: *Ascomata* hysterothecial, superficial or sunken in substrate, oval to elongate, or globose to subglobose, dark brown to black, carbonaceous, glabrous, straight or curved, with a subiculum, with brown hyphae. *Ostiole* slit-like, with a small to large, flat, crest-like apex. *Peridium* thick at the sides, broad at the apex and thinner at the base, dark brown, comprising a single stratum of dark brown cells of *textura angularis* in the inside and thin-walled cells of *textura prismatica* in the exterior part. *Hamathecium* comprising cylindrical to filiform pseudoparaphyses in a gelatinous matrix. *Asci* 8-spored, bitunicate, fissitunicate, elongate cylindric-clavate, straight or slightly curved, short-pedicellate, apically rounded, with an ocular chamber. *Ascospores* overlapping bi-seriate, narrowly fusiform to broadly cylindrical, straight or

slightly curved, 1–3-septate, hyaline to pale brown, smooth, surrounded by a narrow appendage-like sheath. Asexual morph: Undetermined.

Type species – *Byssolophis byssiseda* (Flageolet & Chenant.) Clem. 1931

Notes – The monotypic genus *Byssolophis* is based on *B. byssiseda* found on branches of *Carpini rigny*. Currently, two more species are accommodated in this genus namely, *B. ampla* (Berk. & Broome) L. Holm and *B. sphaerioides* (P. Karst.) E. Müll. (Holm 1986, Müller & von Arx 1962).

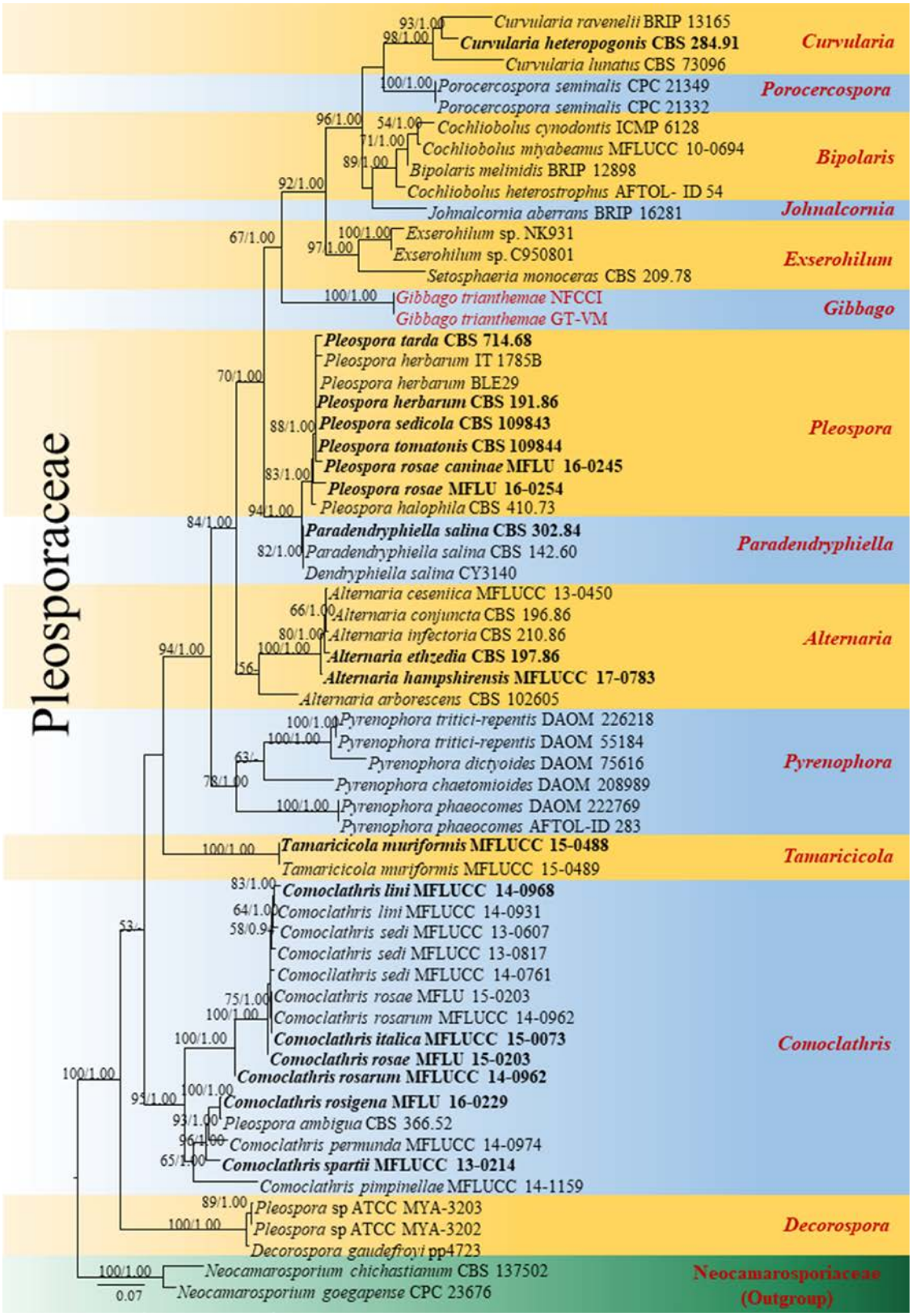

Figure 10 – Phylogram generated from maximum likelihood analysis based on ITS sequence data retrieved from the GenBank. Related sequences were referred to Wanasinghe et al. (2018). Sixteen-one taxa are included in the genes sequence analyses which comprise 618 characters after alignment. *Neocamarosporium chichastianum* (CBS 137502), *Neocamarosporium goegapense* (CPC 23676) are used as the out-group taxon. Maximum likelihood (ML) analysis was conducted in the CIPRES Science Gateway V. 3.3. The best sorting RAxML tree with a final likelihood value of -5725.732510 is presented. Estimated base frequencies were as follows: A = 0.231229, C = 0.247168, G = 0.234507, T = 0.287096; substitution rates AC = 1.411986, AG = 1.991610, AT= 1.292870, CG = 0.994088, CT = 3.032473, GT = 1.000000; gamma distribution shape parameter α = 1.220238; proportion of invariant 0.455010. ML bootstrap values ≥ 50% are given as the first set of numbers and approximate likelihood-ratio test (aLRT) ≥ 0.90 values as the second set of numbers above the nodes. Voucher/strain numbers are given after the taxon names, the one from type material are indicated in bold face. Sequence of interest is indicated in red. The bar length indicates the number of nucleotide substitutions per site.

The asexual morph of this genus is unknown. Due to its uncertain taxonomic placement, the genus was placed in Dothideomycetes genera *incertae sedis* (Wijayawardene et al. 2014). Zhang et al. (2012) examined the type species of *B. byssiseda* and suggested similar morphological characters to species in *Lophiostoma*, but could not resolve the taxonomic placement. We re-examined another species, *B. sphaerioides* (Nyl. ex P. Karst.) E. Müll. from K herbarium under the code K (M) 164030 in which the ascomata, asci and ascospores showed morphology similar to Tetraplosphaeriaceae. We also carried out phylogenetic analysis with the strains of *Byssolophis sphaerioides* (IFRDCC 2053) using LSU, SSU, TEF and RPB2 sequences from GenBank. *Byssolophis sphaerioides* clusters as an independent lineage close to *Quadricura septentrionalis* and other members of the Tetraplosphaeriaceae (Pleosporales) with weak bootstrap support (Fig. 13). Therefore, we transfer the genus *Byssolophis* in Tetraplosphaeriaceae as ascomata are scattered to gregarious, immersed to superficial, gabrous or with brown hyphae, asci are cylindrical to clavate with a short pedicel and ascospores are 1–3-septate, hyaline to pale brown surrounded by a narrow appendage-like sheath.

Byssolophis sphaerioides (Nyl. ex P. Karst.) E. Müll., in Müller & von Arx, Beitr. Kryptfl. Schweiz 11(no. 2): 341 (1962) Fig. 14

≡ *Hysterographium sphaerioides* Nyl. ex P. Karst., Not. Sällsk. Fauna et Fl. Fenn. Förh. 11: 258 (1870) [1871]

Index Fungorum number: IF 569553; Facesoffungi number*:* FoF 06225

Saprobic on decaying wood. Sexual morph: *Ascomata* 105–238 μm high × 169–373 μm diam ($\overline{x}$ = 133.5 × 346.9 μm, n = 10), hysterothecial, superficial or sunken in substrate, oval to elongate, or globose to subglobose, dark brown to black, carbonaceous, glabrous, straight or curved, with a subiculum, with brown hyphae. *Ostiole* slit-like, with a small to large, flat, crest-like apex. *Peridium* 21– 45 μm thick at the sides, broad at the apex and thinner at the base, dark brown, comprising a singl\e stratum of dark brown cells of *textura angularis* in the inside and thin-walled cells of *textura prismatica* in the exterior part. *Hamathecium* comprising 1–1.9 μm wide, cylindrical to filiform pseudoparaphyses in a gelatinous matrix. *Asci* 50–89 μm × 8.7–8.9 μm ($\overline{x}$ = 74.5 × 8.9 μm, n = 10), 8-spored, bitunicate, fissitunicate, elongate cylindric-clavate, straight or slightly curved, short-pedicellate, apically rounded, with an ocular chamber. *Ascospores* 18–26 μm × 5–6 μm ($\overline{x}$ = 21 × 6 μm, n = 10) overlapping bi-seriate, narrowly fusiform to broadly cylindrical, straight or slightly curved, 1–3-septate, hyaline to pale brown, smooth, surrounded by a narrow appendage-like sheath. Asexual morph: Undetermined.

Material examined – Unknown, on decaying wood, ex herb C.E. Broome, 1886, (K (M) 164030, isotype).

Economic significance – None is reported.

Pleosporales, genus *incertae sedis*

Homostegia Fuckel, Jb. nassau. Ver. Naturk. 23-24: 223 (1870) [1869-70]

Lichenicolous on thallus of *Lichens*. Sexual morph: *Ascomata* immersed to semi-immersed, black, solitary, scattered, or in small groups, discoid to rounded, carbonaceous, multilocular, wall black to grayish, roughened, dehiscence via irregular slit appearing on upper part of the wall. *Locules* globose to subglobose, forming a single layer within ascostromata. *Peridium* 1–2 layered, composed of highly pigmented cells of *textura angularis*, reddish-brown cells. *Hamathecium* dense with cellular hyaline, septate pseudoparaphyses. *Asci* 8-spored, bitunicate, fissitunicate, dehiscence not observed, obovoid to broadly cylindrical, forms short, broad, hamate shaped pedicel. *Ascospores* partially overlapping, fusiform to ellipsoidal to broadly ellipsoidal, brown to reddish-brown, 3-longitudinal septa, constricted at septa, slightly curved, smooth-walled. Asexual morph: Undetermined.

Type species – *Homostegia adusta* Fuckel

Notes – The genus *Homostegia* was introduced by Fuckel (1870). *Homostegia adusta* was isolated from the lichen *Parmelia saxatilis* in Germany. The genus is characterized by black multiloculate stromata and brown 3-septate and regularly asymmetric ascospores. Currently, the genus *Homostegia* comprises five species. The asexual morph is unknown. No cultures or molecular data are available. Doilom et al. (2018) studied the lectotype specimen, *Homostegia piggotii* and mentioned that the latter is the synonym of *Homostegia adusta* and retained the genus in Pleosporales, genera *incertae sedis*. In this study, we re-examined the holotype specimen of *Homostegia adusta* under the code G-322312/1 from G herbarium. Both *Homostegia piggotii* and *Homostegia adusta* are isolated from the same host namely *Parmelia* spp. and are characterized by multiloculate ascomata, 8-spored asci as well as dark brown, ellipsoidal to fusiform ascospores. These characters resemble species of the family Decampiaceae. However, we retain the genus in Pleosporales, genera *incertae sedis* until molecular data becomes available.

Homostegia adusta Fuckel, Jb. nassau. Ver. Naturk. 23-24: 223 (1870) Fig. 15

Index Fungorum number: IF 243056; Facesoffungi number: FoF 06247

Lichenicolous on thallus of *Parmelia saxatilis*. Sexual morph: *Ascomata* 660–780 µm high, 645–750 µm diam., immersed to semi-immersed, black, solitary, scattered, or in small groups, discoid to rounded, carbonaceous, multilocular, wall black to grayish, roughened, dehiscence via irregular slit appearing on upper part of the wall. *Locules* 94–143 µm × 98–107 µm ($\overline{x}$ = 108.9 × 102.8 µm, n = 10), globose to subglobose, forming a single layer within ascostromata. *Peridium* 1–2 layered, composed of reddish-brown pigmented cells of *textura angularis*. *Hamathecium* dense with cellular hyaline, septate pseudoparaphyses. *Asci* 34–37 µm × 14–17 µm ($\overline{x}$ = 35.2 × 16.2 µm, n = 10), 8-spored, bitunicate, fissitunicate dehiscence not observed, obovoid to broadly cylindrical, forms short, broad, hamate shaped pedicel. *Ascospores* 16–22 × 6–9 µm ($\overline{x}$ = 22.9 × 6.6 µm, n = 15), partially overlapping, fusiform to ellipsoidal to broadly ellipsoid, sometimes reniform, brown to reddish-brown with 3 longitudinal septa, constricted at septa, slightly curved, smooth-walled. Asexual morph: Undetermined.

Material examined – GERMANY, Baden-Württemberg, on thallus of *Parmelia saxatilis* (Parmeliaceae), 1869 -1870, KWG Fuckel (G-322312/1, holotype).

Economic significance – Species of *Homostegia* are lichenicolous fungi that are pathogens, saprotrophs, and commensals. The genus *Homostegia* has been reported to cause small yellow, indefinite spots on leaves of *Bambusa* sp. in the Philippines (Stevenson & John Albert 1926).

Dothideomycetes, families *incertae sedis*

Coccoideaceae Henn. ex Sacc. & D. Sacc.

Englerodothis Theiss. & Syd., Annls mycol. 13(3/4): 285 (1915)

Biotrophic, *pathogenic* or *saprobic* on living and dead leaves of *Mayepea gilgiana*. Sexual morph: *Stroma* black, hard, subglobose to hemispherical, hypostromatic, multiloculate, strongly convoluted and forming an elaborate geometrical pattern externally, in diam, the opposite upper

surface of the leaf has sunken deeply in the extension of the stromata and has a dirty yellow discoloration, irregular in circumference, roundish, elongated or blister-shaped. *Locules* numerous and dense, spherical, elongate but merging with stromatal tissue, made up of dark brown angular cells with 1–2 paler inner layers, the apical part, flat and dark brown, splitting at maturity to expose asci and interascal tissue.

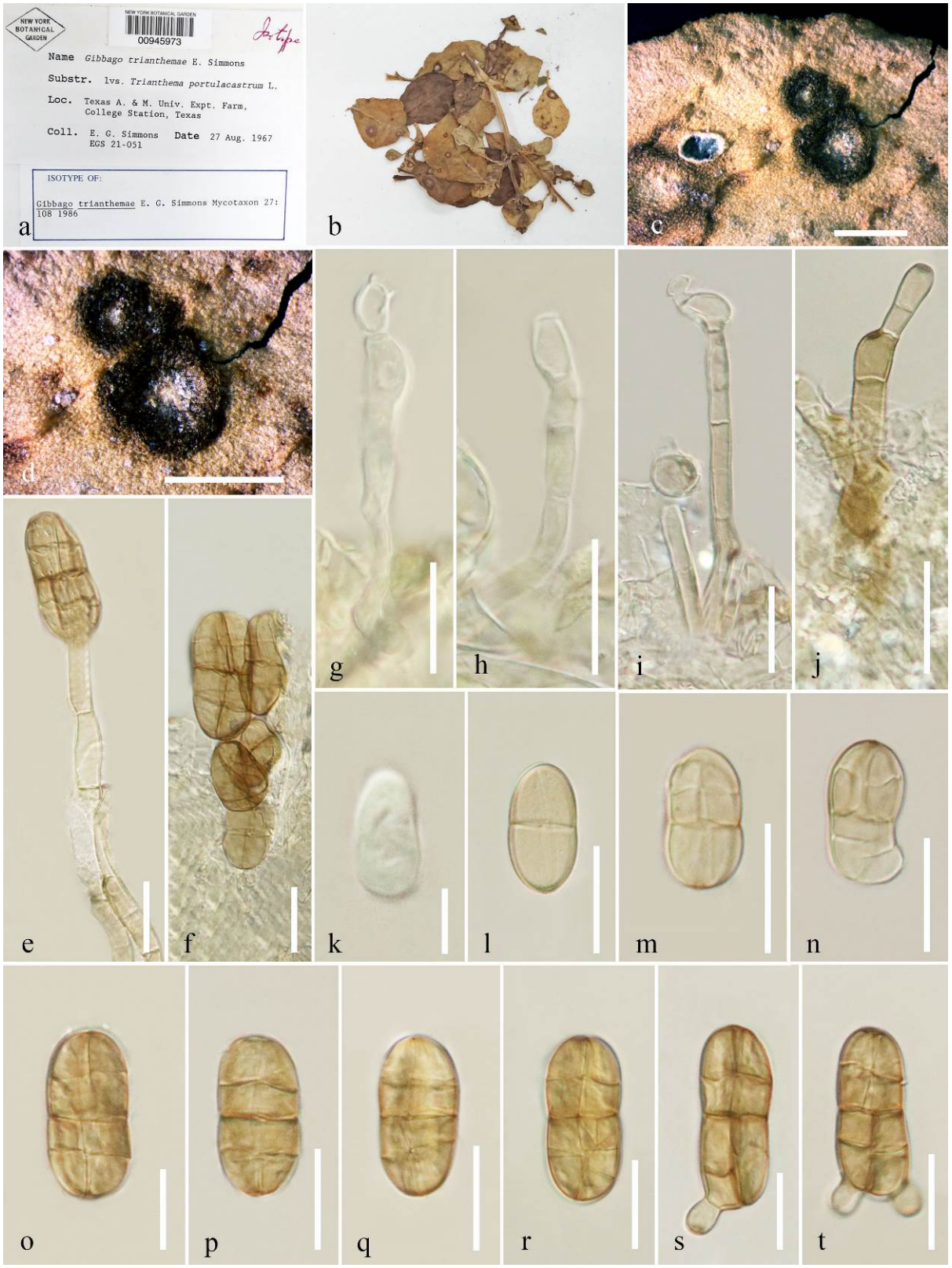

Figure 11 – *Gibbago trianthemae* (NY 00945973, isotype). a, b Herbarium material. c, d Appearance of conidiomata on host surface. g–j Conidiophores and conidiogenesis. k–t Conidia

(arrows showing apical cells that have sporulated directly. e: Conidium have produced hyphal conidiophores) Scale bars: c, d = 2 mm, e–t = 20 μm, k = 5 μm.

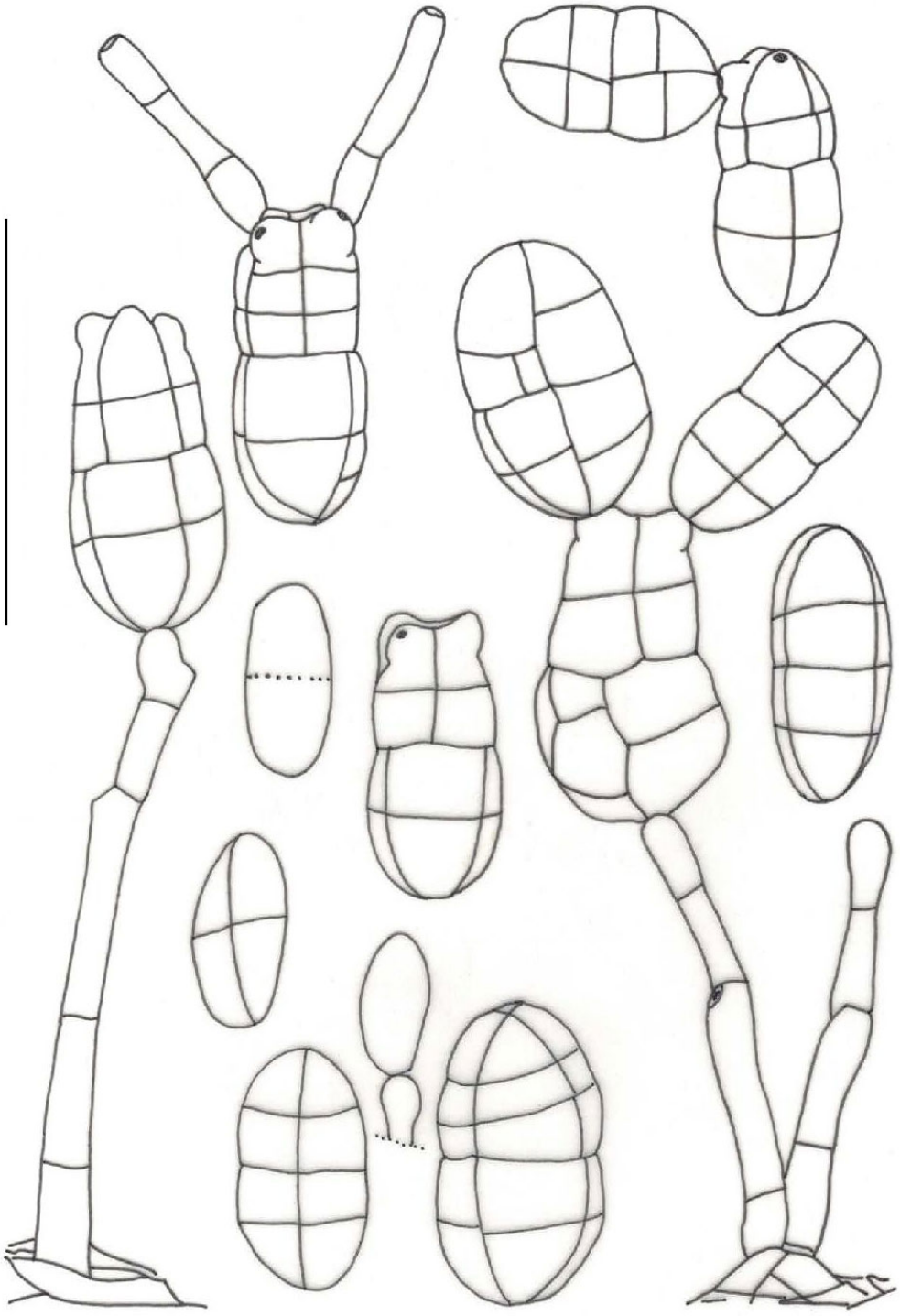

Figure 12 – *Gibbago trianthemae* (redrawn from Simmons 1986), conidia and conidophores; conidium at upper left exhibits two apical cells that have sporulated directly and two of them have produced hyphal conidiophores. Scale bar: x = 50 μm.

Individual stomatal elements, the tissues surrounding the locules made up of brown to dark brown pseudoparenchymatous tissue, lower region of base composed of layers of small hyaline angular cells which tend to replace the cuticular lining of the leaf and penetrate between the distorted epidermal cells. Interascal tissue of cellular pseudoparaphyses, copiously filamentous, with each filament consisting of a chain of hyaline cells, the lower ones being compressed by the

growing asci, the upper ones irregular in shape becoming pigmented and surrounded by a copious gelatinous matrix. *Asci* 8-spored, cylindrical to cylindric-clavate, the apex broadly rounded, the base tapering abruptly to a short stalk, fairly thick-walled at all stages, thickest at the apex, fissitunicate, without an apical ring. *Ascospores* arranged biseriately, 1-septate, slightly constricted at the septum, the upper cell with a rounded end, the lower one tapering, hyaline when young, pale brown at maturity, smooth-walled. Asexual morph: Undetermined.

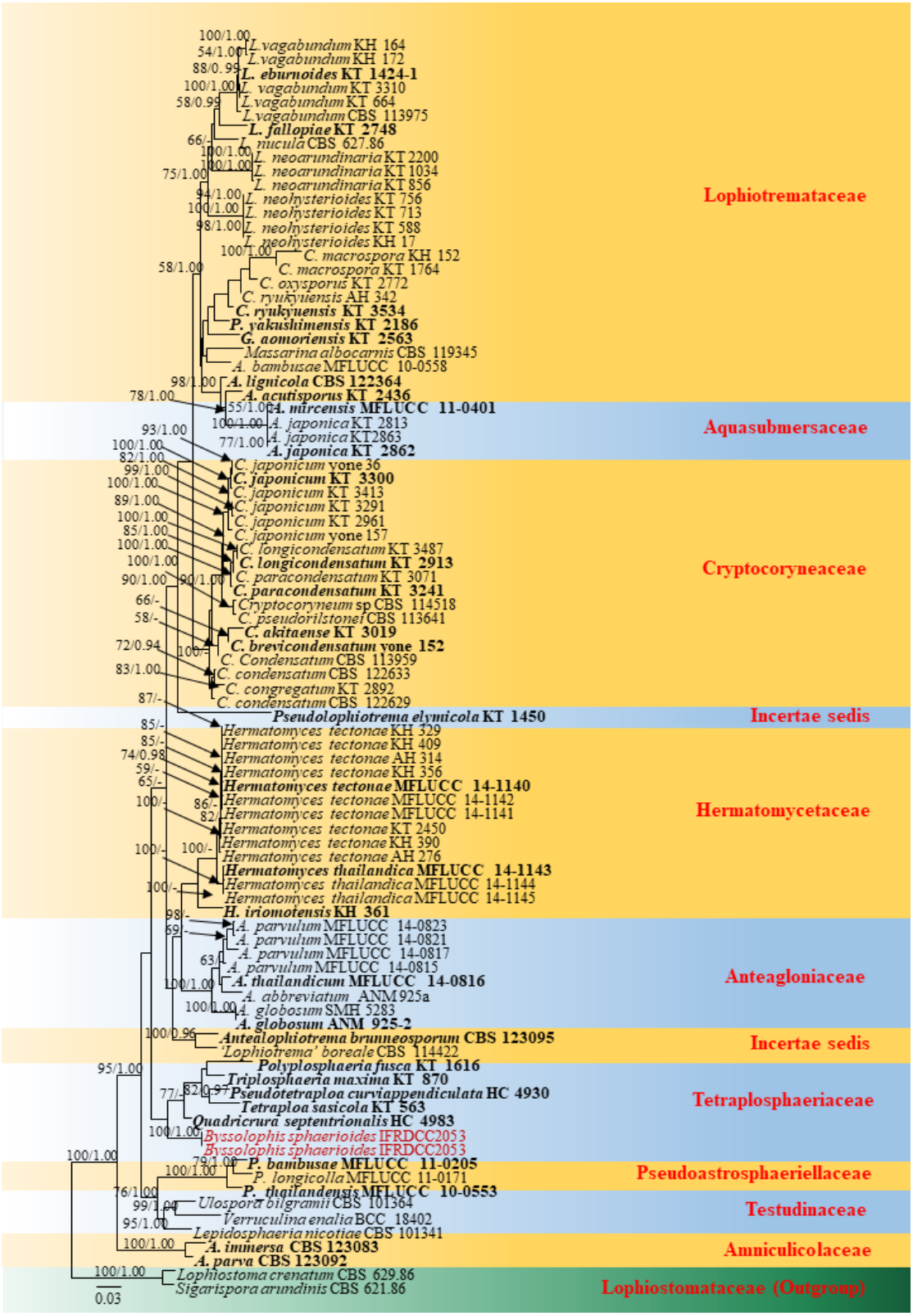

Figure 13 – Phylogram generated from maximum likelihood analysis based on combined LSU, SSU, TEF and RPB2 sequence data retrieved from the GenBank. Related sequences were referred to Hashimoto al. 2017). Eighty-nine taxa are included in the gene sequence analyses which comprise 3457 characters after alignment. *Lophiostoma crenatum* (CBS 629. 86) and *Sigarispora arundinis* (CBS 621. 86) are used as the out-group taxa. Maximum likelihood (ML) analysis was conducted in the CIPRES Science Gateway V. 3.3. The best sorting RAxML tree with a final likelihood value of -26435.927200 is presented. Estimated base frequencies were as follows: A = 0.247476, C = 0.248533, G = 0.272591, T = 0.231400; substitution rates AC = 1.176163, AG = 4.952466, AT= 1.237377, CG = 1.159438, CT = 9.445473, GT = 1.000000; gamma distribution shape parameter $\alpha = 0.457069$; proportion of invariant 0.561533. ML bootstrap values ≥ 50% are given as the first set of numbers and approximate likelihood-ratio test (aLRT) ≥ 0.90 values as the second set of numbers above the nodes. Voucher/strain numbers are given after the taxon names, the one from type material are indicated in bold face. Sequence of interest is indicated in red. The bar length indicates the number of nucleotide substitutions per site.

Type species – *Englerodothis kilimandscharica* (Henn.) Theiss. & Syd.

Notes – The genus *Englerodothis* was introduced by Theissen and Sydow (1915) for the type species *Englerodothis kilimandscharica.* The asexual morph is unknown. Currently, three species are accomodated in this genus. *Englerodothis* was placed in Parmulariaceae by many authors (Hofmann 2009, Lumbsch & Huhndorf 2010). However, Hyde et al. (2013) excluded the genus *Englerodothis* from Parmulariaceae as *Englerodothis* had enclosed ascomata and only one ascomatal wall layer composed of cells of *textura angularis* (Inácio & Cannon 2008). Cultures and sequences are unavailable. We studied the type specimen of *Englerodothis kilimandscharica* from S herbarium under the code F203689. *Englerodothis kilimandscharica* shares similar characters with the genus *Coccoidea*, such as circular or discoid ascostroma, multi-loculate, dark pigmented, bitunicate asci and 1-septate and light pigmented ascospores. *Englerodothis* is therefore tentatively placed in the family Coccoideaceae.

Englerodothis kilimandscharica (Henn.) Theiss. & Syd., Annls mycol. 13(3/4): 285 (1915)

Fig. 16

≡ *Cocconia kilimandscharica* Henn., in Engler, Pflanzenw. Ost-Afrikas Nachbarg., Teil C: 31 (1895)

Index Fungorum number: IF 150008; Facesoffungi number: FoF 06240

Biotrophic, pathogenic or *saprobic* on living and dead leaves of *Mayepea gilgiana*. Sexual morph: *Stroma* black, hard, subglobose to hemispherical, hypostromatic, multiloculate, strongly convoluted and forming an elaborate geometrical pattern externally, 7–8 mm in diam, the opposite upper surface of the leaf has sunken deeply in the extension of the stromata and has a dirty yellow discoloration, irregular in circumference, roundish, elongated or blister-shaped. *Locules* very numerous and dense, spherical. Individual stomatal elements up to 133–139 µm wide, 107–116 µm high, the tissues surrounding the locules made up of brown to dark brown pseudoparenchymatous tissue, lower region of base composed of small hyaline angular cells which tend to replace the cuticular lining of the leaf and penetrate between the distorted epidermal cells. *Locules* elongate the side wall, but merging with stromatal tissue, made up of dark brown angular cells with 1–2 paler inner layers, the apical part, flat, and dark brown, splitting at maturity to expose asci and interascal tissue. Interascal tissue of cellular pseudoparaphyses, copious, filamentous, each filament consisting of a chain of hyaline cells, the lower ones being compressed by the growing asci, the upper ones irregular in shape and reaching and becoming pigmented and surrounded by a copious gelatinous matrix. *Asci* 58–61 µm × 11–19 µm ($\bar{x}$ = 59.5 × 16.7 µm, n = 10), 8-spored, cylindrical to cylindric-clavate, the apex broadly rounded, the base tapering abruptly to a short stalk, fairly thick-walled at all stages, thickest at the apex, fissitunicate, without an apical ring. *Ascospores* 15–16 µm × 5–6 µm ($\bar{x}$ = 16.3 × 6.0 µm, n = 10), arranged biseriately, 1-septate, slightly constricted at

the septum, the upper cell with a rounded end, the lower one tapering, smooth and hyaline when young, pale brown at maturity. Asexual morph: Undetermined.

Figure 14 – *Byssolophis sphaerioides* (K (M) 164030, isotype). a–b Herbarium specimen and habit on leaf. c Appearance of ascomata on the host surface. d Section of ascoma. e Peridium. f

Hamathecium. g–i Asci. j–l Ascospores. Scale bars: c = 500 µm, d = 100 µm, e = 50 µm, f = 10 µm, g–i = 20 µm, j–l = 5 µm.

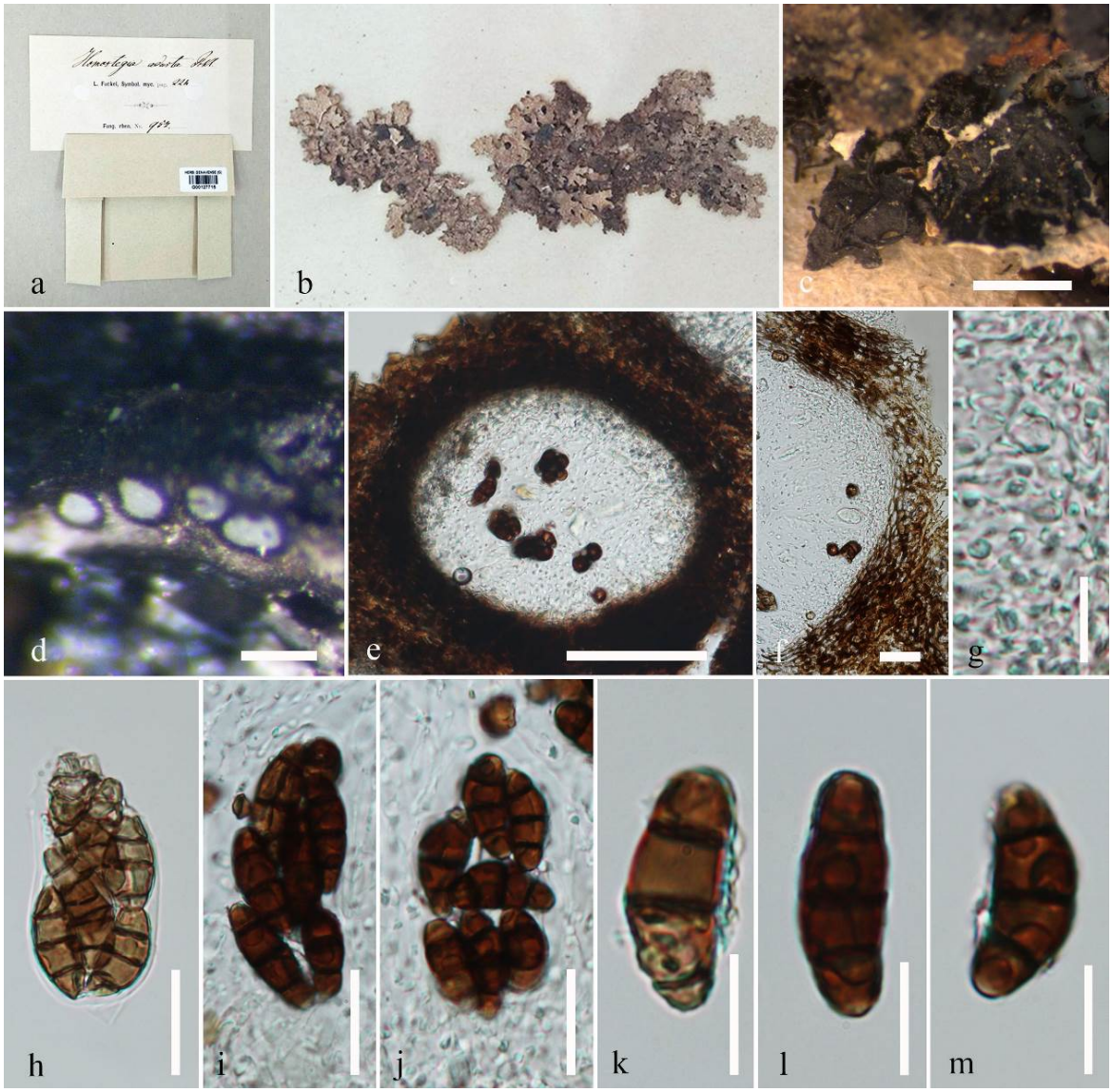

Figure 15 – *Homostegia adusta* (G-322312/1, holotype). a, b Details of herbarium material. c Habit and appearance of ascomata on host surface. d Locules within ascostromata. e Section of ascoma. f Peridium. g Hamathecium. h–j Asci. k–m Ascospores. Scale bars: c = 1 mm, d = 200 µm, e = 30 µm, f, h–j = 20 µm, g, k–m = 10 µm.

Material examined – AFRICA, Tanzania, Boma La Ng'ombe, Kilimanjaro, on living and dead leaves of *Mayepea gilgiana* (Oleaceae), 8 December 1893, G. Volkens, (S-F203689, holotype).

Economic significance – The genus *Englerodothis* is parasitic on living leaf blades petioles, and inflorescences and affect many hosts namely *Mayepea gilgiana* (Oleaceae) by air-borne ascospores. They are mainly reported from Africa, South of Sahara, Tanzania (Inacio & Minter 2000).

Dubujianaceae D. Pem, Doilom & K.D. Hyde, fam. nov.

Index Fungorum number: IF557065; Facesoffungi number: FoF 06679

Endophytic, *saprobic* or *pathogenic* on leaves. Sexual morph: Undetermined. Asexual morph: *Mycelium* at first subcuticular, developing onto leaf surface from leaf glands forming scattered to

sporadically confluent superficial thalli, circular in outline, composed of a basal layer of flattened, parallel, branching, brown hyphae with setae. Non-hyphopodiate hyphal strands radiate from base of central, raised pycnidium over the basal layer and onto the substrate. *Conidiomata wall* composed of thick dark-brown walled cells of *textura globulosa*. *Conidiophores* densely aggregated, slender, subulate, simple, frequently branched above, reduced to conidiogenous cells, or with 1–2 supporting cells. *Conidiogenous cells* annellidic, simple, tapering, hyaline, smooth, rarely with percurrent proliferations. *Conidia* ellipsoidal, fusiform to lunate, hyaline becoming pale brown at maturity, 1-septare, punctate, non-constricted, smooth-walled.

Figure 16 – *Englerodothis kilimandscharica* (S-F203689, holotype). a Details of herbarium material. b, c Habit and appearance of ascomata on host surface. d Section of ascoma. e Peridium. f Hamathecium. g–i Asci. j–m Ascospores. Scale bars: c = 2 mm, d = 30 µm, e, f, j–m = 10 µm, g–i = 20 µm.

Family type – *Dubujiana* D.R. Reynolds & G.S. Gilbert

Notes – The family Dubujianaceae is introduced to accommodate the monotypic genus *Dubujiana* based on its epifoliar lifestyle and unique pycnidia that arise from leaf glands in the outer portions of the hyphal system with individual hyphal strands extending from the large central pycnidium. We introduce the new family Dubujianaceae, because it has a set of unique characters namely ahyphopodiate pycnidia, conidiomata wall composed of dark-brown walled cells of *textura globulosa* and 1-septate, punctate hyaline to pale brown conidia that differ from other families of Dothideomycetes.

Dubujiana D.R. Reynolds & G.S. Gilbert, Aust. Syst. Bot. 18(3): 282 (2005)

Endophytic, *saprobic* or *pathogenic* on leaves. Sexual morph: Undetermined. Asexual morph: *Mycelium* at first subcuticular, developing onto leaf surface from leaf glands forming scattered to sporadically confluent superficial thalli, circular in outline, composed of a basal layer of flattened, parallel, branching, brown hyphae brown hyphae with setae. Non-hyphopodiate hyphal strands radiate from base of central, raised pycnidium over the basal layer and onto the substrate. *Conidiomata wall* composed of thick dark-brown walled cells of *textura globulosa*. *Conidiophores* densely aggregated, slender, subulate, simple, frequently branched above, reduced to conidiogenous cells, or with 1–2 supporting cells. *Conidiogenous cells* annellidic, simple, tapering, hyaline, smooth, with percurrent proliferations. *Conidia* ellipsoidal, fusiform to lunate, hyaline becoming pale brown at maturity, 1-septare, punctate, non-constricted, smooth-walled.

Type species – *Dubujiana glandulifera* D.R. Reynolds & G.S. Gilbert

Notes – During a study of epifoliar ascomycetes from leaf surfaces in the forests of Queensland Australia, Reynolds & Gilbert (2005) reported the monotypic genus *Dubujiana*, with *Dubujiana glandulifera* as the type species, but did not assign the genus to any family. The genus *Dubujiana* is characterized by raised pycnidium over the basal layer of the substrate, densely aggregated, slender conidiophores, and tapering, hyaline conidiogenous cells giving rise to pale brown, 1-septate punctate conidia. Cultures and sequences are unavailable. The genus *Dubujiana* resembles species of Asterinaceae and Microthyriaceae in having superficial hyphae, radiating from base of central layer on the substrate. However, it is distinct in having a pycnidial wall which consists of cells of *textura globulosa* and 1-septate, punctate, non-constricted conidia. We therefore, accommodate the genus *Dubujiana* in a new family Dubujianaceae based on its epifoliar lifestyle and unique morphological characters.

Dubujiana glandulifera D.R. Reynolds & G.S. Gilbert, Aust. Syst. Bot. 18(3): 282 (2005)

Fig. 17

Index Fungorum number: IF344434; Facesoffungi number: FoF 06238

Endophytic, *pathogenic* or *saprobic* on leaves. Sexual morph: Undetermined. Asexual morph: *Mycelium* at first subcuticular, developing onto leaf surface from leaf glands forming scattered to sporadically confluent superficial thalli, circular in outline, composed of a basal layer of flattened, parallel, branching, brown hyphae. *Pycnidium* 181–290 µm × 195–270 µm ($\bar{x}$ = 225.1 × 250.1 µm, n = 10), individual, non-hyphopodiate hyphal strands radiating from base of central, raised over the basal layer and onto the substrate. *Conidiomata wall* 12–27 µm composed of thick dark-brown walled cells of *textura globulosa*. *Conidiophores* densely aggregated, slender, subulate, simple, frequently branched above, reduced to conidiogenous cells, or with 1–2 supporting cells. *Conidiogenous cells* annellidic, simple, tapering, hyaline, smooth, rarely with percurrent proliferation. *Conidia* 5–9 µm × 2–3 µm ($\bar{x}$ = 7.6 × 2.7 µm, n = 10), ellipsoidal, fusiform to lunate,

aseptate, hyaline becoming pale brown at maturity, smooth, 1- septate, punctate, non-constricted, smooth-walled.

Material examined – AUSTRALIA, Queensland, Cape Tribulation Coastal Boardwalk Dubuji, 145°28’ E, 16 °4’S., on leaves, 2 February 2002, Don R. Reynolds (UC AUS399, holotype).

Economic significance –Species of the genus *Dubujiana* are epifoliar fungi and maintain a commensal relationship with the host (Reynolds & Gilbert 2005). They may interrupt light or act synergistically or antagonistically with pathogens and effect on disease development (Dasari 2012).

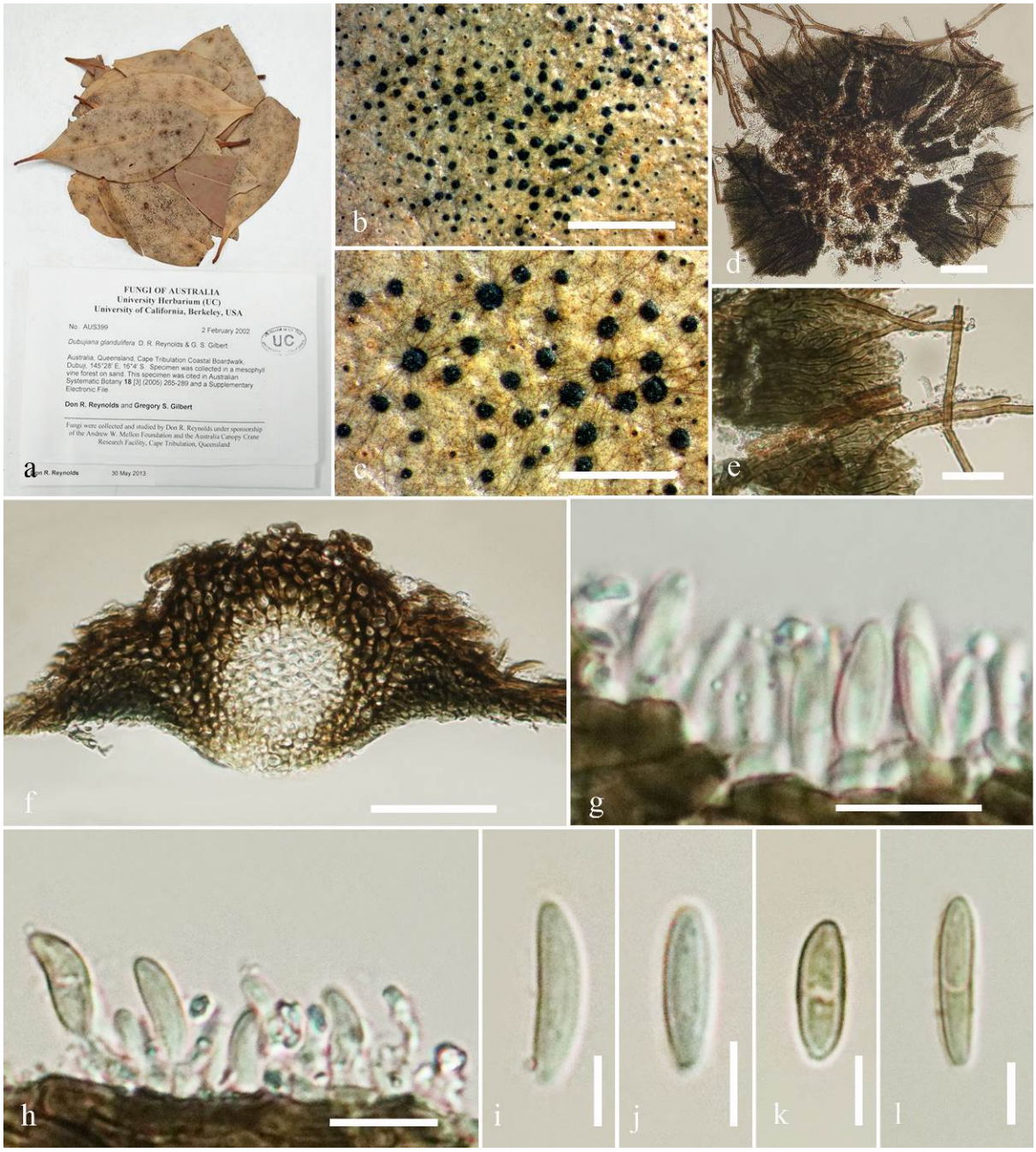

Figure 17 – *Dubujiana glandulifera* (UC AUS399, holotype). a Details of herbarium material. b, c Habit and appearance of conidiomata on host surface. d Squash mount of conidioma. e Dual hyphal system showing small pycnidia in the outer portions with inidividual hyphal strands extending from a large central pycnidium. f Section of conidioma g, h Conidiogenesis. i–l Conidia. Scale bars: b = 2 mm, c = 1 mm, d, e = 20 µm, f = 40 µm, g = 100 µm, h = 10 µm, i–l = 5 µm.

Endosporiaceae D. Pem, Doilom & K.D. Hyde, fam. nov.

Index Fungorum number: IF557066; Facesoffungi number: FoF 06681

Pathogenic on bud of *Populus tremuloides*. Sexual morph: Undetermined. Asexual morph: *Colonies* (conidiomata) on PDA, OA and CA black, raised, cerebriform, comprising numerous cellular clumps in a thin glop covering, subcircular to irregular in outline, reverse black. Margin irregular with scarce, occasionally aggregated hyphae on PDA, even with adpressed or submerged hyphae on MEA. On PDA, cells more broad, swollen, subhyaline and dumbbell-shaped when two-celled, becoming multicellular by splitting in all directions, turning darkly pigmented, irregular in shape, frequently separating into smaller clumps. *Hyphae* cylindric-shaped or toruloid, light to dark brown, branched or unbranched, aerial ones determinate in growth, mostly elongated, hyaline at apex, forming muriform and darkly pigmented bodies. *Endoconidia* developing from the separation of adjacent daughter cells in cellular clumps through septum schizolysis, unicellular, hyaline, ellipsoidal to subglobose turning broadly ellipsoidal to globose. *Blastic conidia* abundant in mature colonies, arising from cells of cellular clumps or seldom from sides of hyphae, unicellular, hyaline or light brown, cylindrical to ellipsoidal, regularly truncate at the base, sometimes globose, obovoid, fusiform.

Family type – *Endosporium* Tsuneda

Notes – The family Endosporiaceae is introduced to accommodate the genus *Endosporium* typified by *E. populi-tremuloides.* Endosporiaceae is characterized by cylindric-shaped hyphae, ellipsoidal, subglobose to globose endoconida and cellular clumps, globose, obovoid, fusiform blastic conidia. The family Endosporiaceae is distinct from other families in the Dothideomycetes in having endoconidia forming as cellular clumps through septum schizolysis and blastic hyaline or light brown conidia. Further studies may aim to link asexual morphs of species in this family to their sexual counterparts.

Endosporium Tsuneda, in Tsuneda, Davey, Hambleton & Currah, Botany 86(9): 1022 (2008)

Pathogenic on bud of *Populus tremuloides*. Sexual morph: Undetermined. Asexual morph: *Colonies* (conidiomata) on PDA, OA and CA black, raised, cerebriform, comprising numerous cellular clumps in a thin glop covering, subcircular to irregular in outline, reverse black. Margin irregular with scarce, occasionally aggregated hyphae on PDA, even with adpressed or submerged hyphae on MEA. Conidiogenous cells on PDA, more broad, swollen, subhyaline and dumbbell-shaped when two-celled, becoming multicellular by splitting in all directions, turning darkly pigmented, irregular in shape, frequently separating into smaller clumps. *Hyphae* cylindric-shaped or toruloid, light to dark brown, branched or unbranched, aerial ones determinate in growth, mostly elongated, hyaline at apex, forming muriform and darkly pigmented bodies. *Endoconidia* developing from the separation of adjacent daughter cells in cellular clumps through septum schizolysis, unicellular, hyaline, ellipsoidal to subglobose turning broadly ellipsoidal to globose. *Blastic conidia* abundant in mature colonies, arising from cells of cellular clumps or seldom from sides of hyphae, unicellular, hyaline or light brown, cylindrical to ellipsoidal, regularly truncate at the base, sometimes globose, obovoid, fusiform.

Type species – *Endosporium populi-tremuloides* Tsuneda

Notes – The hyphomycetous genus *Endosporium* was the first genus with endoconidial and black meristematic cells reported in the order Myriangiales by A. Tsuneda. The genus *Endosporium* is characterized by subhyaline and dumbbell-shaped cells forming ellipsoidal to globose hyaline endoconidia and hyaline or light brown, cylindrical to ellipsoidal blastic conidia. Two species namely, *Endosporium populi-tremuloides* Tsuneda and *E. aviarium* Tsuneda are accommodated in the genus *Endosporium*. *Endosporium populi-tremuloides* is the type species of the genus and was found on the bud of *Populus tremuloides*. Cultures and sequences are available. Phylogenetic analyses using LSU, SSU and ITS sequences from GenBank strongly support placement of the genus *Endosporium* as an independent lineage (Fig. 18). It is not clear whether *Endosporium* should be in Myriangiales or not. The genus *Endosporium* is distinct from all species

in the Dothideomycetes and is accommodated in a new family Endosporiaceae, order *incertae sedis*.

Endosporium populi-tremuloides Tsuneda, in Tsuneda, Davey, Hambleton & Currah, Botany 86(9): 1023 (2008) Fig. 19

Index Fungorum number: IF536901; Facesoffungi number: FoF 06239

Pathogenic on bud of *Populus tremuloides*. Sexual morph: Undetermined. Asexual morph: *Colonies* (conidiomata) on PDA, OA and CA black, raised, cerebriform, comprising numerous cellular clumps in a thin glop covering, subcircular to irregular in outline, reverse black. Margin irregular with scarce, occasionally aggregated hyphae on PDA, even with appressed or submerged hyphae on MEA. On PDA, conidiogeneous cells 6–15 µm × 8–20 µm ($\bar{x}$ = 11.5 × 19.8 µm, n = 10), broad, subhyaline and dumbbell-shaped when two-celled, later splitting by septations in all directions, turning darkly pigmented, irregular in shape, frequently separating into smaller clumps. *Hyphae* 65 µm long, 3–6 µm wide cylindric-shaped or torulose, light to dark brown, branched or unbranched, aerial ones determinate in growth, mostly elongated, hyaline at the apex, forming muriform and darkly pigmented bodies. *Endoconidia* 2.5–5 µm × 1–3 µm ($\bar{x}$ = 3.5 × 2.8 µm, n = 10), developing from the separation of adjacent daughter cells in cellular clumps through schizolytic septum, unicellular, hyaline, ellipsoidal to subglobose turning broadly ellipsoidal to globose. *Blastic conidia* 2.5–14.5 µm × 1–4.5 µm ($\bar{x}$ = 3.5 × 2.8 µm, n = 10), abundant in mature colonies, arising from cells of cellular clumps or rarely from sides of hyphae, unicellular, hyaline or light brown, cylindrical to ellipsoidal, regularly truncate at the base, sometimes ovoid.

Material examined – CANADA, Whitemud Creek, Edmonton, Lansdowne, ca. 1 km west of the Northern Forestry Centre, Alberta, on bud of *Populus tremuloides* (Salicaceae), 3 November 2002, A. Tsuneda (UAMH 10529, holotype).

Economic significance – Species of the genus *Endosporium* are phytopathogenic fungi that cause scab, anthracnose, and leaf spot diseases on woody plants, as well as species of Salicaceae (Taylor et al. 2001, Butin & Kehr 2004). The genus *Endosporium* can also cause mycotic diseases in humans due to their meristematic growth (Tsuneda et al. 2008).

Macrovalsariaceae D. Pem, Doilom & K.D Hyde, fam. nov.

Index Fungorum number: IF557067; Facesoffungi number: FoF 06682

Saprobic on dead twigs, wood, bamboo and culms of a wide range of hosts. Sexual morph: *Ascostromata* dark brown to black, immersed to erumpent, solitary to a few in a group, carbonaceous, oblate, sphaeroid to subsphaerical, with a central ostiole. *Peridium* comprising brown and small-celled *textura angularis*. *Asci* 8-spored, bitunicate, fissitunicate, cylindro-clavate, with a short fine pedicel, apically rounded with a small ocular chamber. *Paraphyses* unbranched, tapering upwards, apically free. *Ascospores* uniseriate to irregularly uniseriate, 1– septate, brown, elliptical-fusoid, slightly constricted at septum, with skull cap-like germ apparatus at the lower end, transverse striation near the center of lower cell with longitudinal striations from transverse striation to the end cell surface smooth, granular to verrucose. Asexual morph: Undetermined.

Family type – *Macrovalsaria* Petr.

Notes – The family Macrovalsariaceae is introduced to accommodate the monotypic genus *Macrovalsaria* typified by *M. leonensis*. Macrovalsariaceae has dark brown to black *ascostromata*, cylindro-clavate asci, with a short fine pedicel and elliptical to fusoid ascospores with skull cap-like germ apparatus. Phylogenetically, *Macrovalsaria* clustered in a strongly supported clade among the families in the order Pleosporales. The family Macrovalsariaceae shares some similar characters of ascostromata and asci with Valsariaceae. However, Macrovalsariaceae differs from Valsariaceae by its ascospores features.

Macrovalsaria Petr., Sydowia 15(1-6): 298 (1962) [1961]

Saprobic on dead twigs, wood, bamboo and culms of a wide range of hosts. Sexual morph: *Ascostromata* dark brown to black, immersed to erumpent, solitary to a few in a group,

carbonaceous, oblate, sphaeroid to subsphaerical, with a central ostiole. *Peridium* comprising brown and small-celled *textura angularis*. *Asci* 8–spored, bitunicate, fissitunicate, cylindro-clavate, with a short fine pedicel, apically rounded with a small ocular chamber. *Paraphyses* unbranched, tapering upwards, apically free. *Ascospores* uniseriate to irregularly uniseriate, 1– septate, brown, elliptical-fusoid, slightly constricted at septum, with skull cap-like germ apparatus at the lower end, transverse striation near the center of lower cell with longitudinal striations from transverse striation to the end cell, surface smooth, granular to verrucose. Asexual morph: Undetermined.

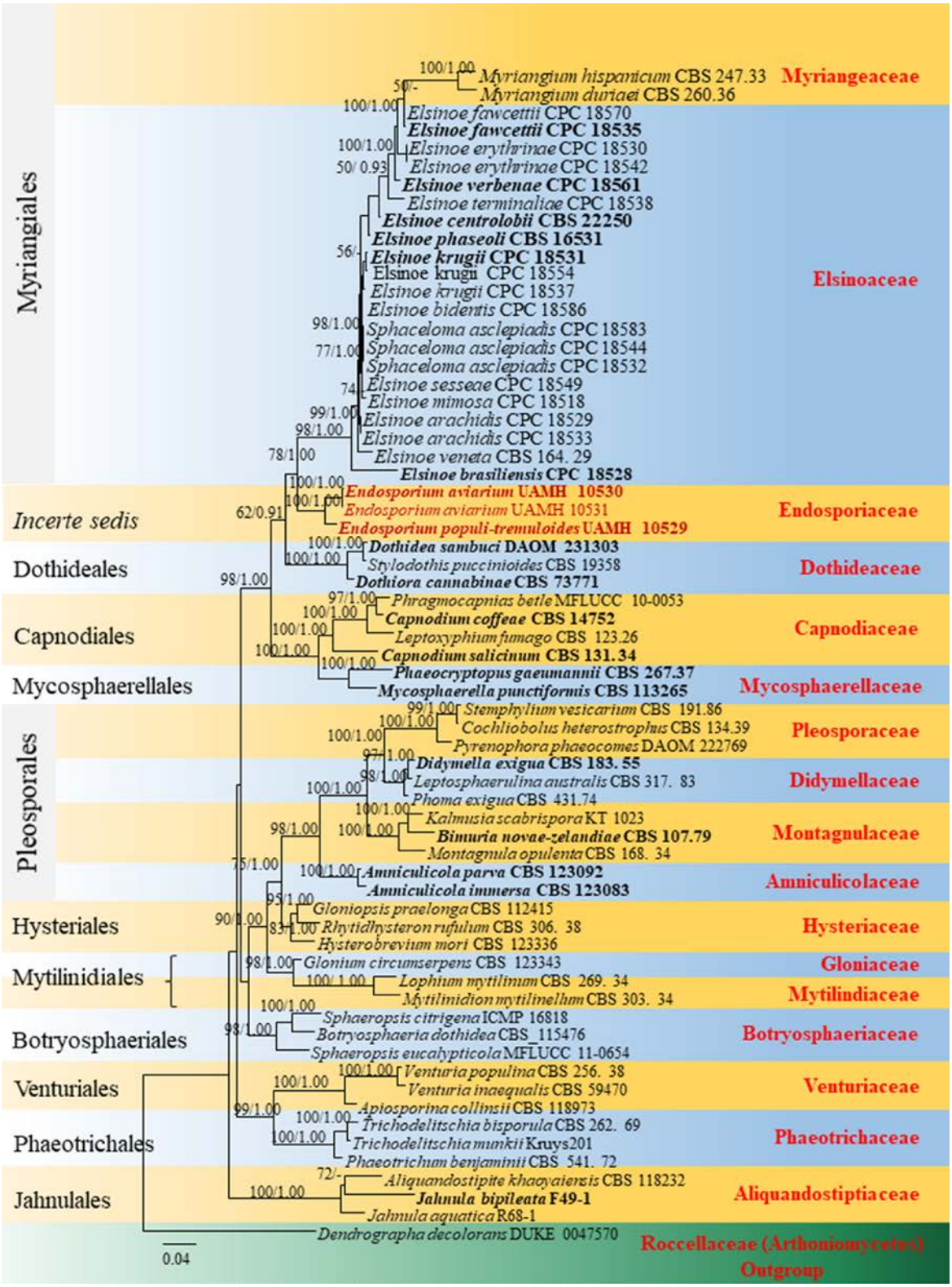

Figure 18 – Phylogram generated from maximum likelihood analysis based on combined LSU SSU and ITS sequence data retrieved from the GenBank. Related sequences were referred to Tsuneda et al. 2008 and Jayawardene et al. 2014). Sixty-five taxa are included in the genes sequence analyses which comprise total 2581 characters after alignment. *Dendographa decolorans* (DUKE 0047570) is used as the out-group taxon. Maximum likelihood (ML) analysis was conducted in the CIPRES Science Gateway V. 3.3. The best sorting RAxML tree with a final likelihood value of -20117.489107 is presented. Estimated base frequencies were as follows: A = 0.255618, C = 0.221836, G = 0.277683, T = 0.244863; substitution rates AC = 1.219900, AG = 2.441823, AT= 1.343822, CG = 1.136438, CT = 6.322671, GT = 1.000000; gamma distribution shape parameter α = 0.470888; proportion of invariant 0.356870. ML bootstrap values ≥ 50% are given as the first set of numbers and approximate likelihood-ratio test (aLRT) ≥ 0.90 values as the second set of numbers above the nodes. Voucher/strain numbers are given after the taxon names, the one from type material are indicated in bold face. Sequence of interest is indicated in red. The bar length indicates the number of nucleotide substitutions per site.

Type species – *Macrovalsaria leonensis* (Deighton) Petr. 1962

Notes – Petrak & Deighton (1962) introduced the genus *Macrovalsaria* with *M. leonensis* (≡ *Valsaria leonensis* Deighton, in Petrak & Deighton 1952) as the type species. The genus *Macrovalsaria* has a global distribution in the tropics. Sivanesan (1975) examined the type specimen of *M. megalospora* (≡ *Sphaeria megalospora* Mont.) and several other specimens including *M. leonensis* (Deighton) Petr. (the generic type), and synonymised all of them under *Macrovalsaria megalospora* which is the primogenital epithet. The unique characteristic of the genus *Macrovalsaria* is the brown, uniseptate ascospores that are constricted at the septum and the skull cap-like germ apparatus at the base (Sivanesan 1975, Hyde et al. 2000). The asexual morph is unknown. Phylogenetic analysis carried out by Li & Zhuang (2009) based on 28S rDNA showed that the genus *Macrovalsaria* is related to Botryosphaeriales and in their analysis, two strains of *M. megalospora* clustered in the *Lasiodiplodia*. Cultures and sequences are available but not for the type species. In another study, Doilom et al. (2017) described *Macrovalsaria megalospora* from *Tectona grandis* in northern Thailand, provided voucher specimens and placed their voucher specimens to Dothideomycetes *incertae sedis* based on morphology and phylogenetic analysis. We re-studied the specimen of *Macrovalsaria leonensis* from PDD collected by Deighton under the code PDD 14987. The ascospores illustrated are re-drawn from Chacón et al. (2014) to show the diagnostic characters of the ellipsoidal ascospores namely, the helmet-like cover with striae toward one end and the occurrence of single septum. We carried out phylogenetic analysis with the strains provided by Li & Zhuang (2009) as well as those of Doilom et al. (2017). The strains of *M. megalospora* provided by Li & Zhuang (2009) clustered in the *Lasiodiplodia* which is inconclusive as the analysis was based only on 28S large ribosomal subunit RNA gene regions. In depth analysis using TEF (data not shown) and ITS sequences of the reference specimen of *M. megalospora* provided by Doilom et al. (2017) shows that *M. megalospora* forms an independent lineage close to Valsariaceae and closely related families in the Dothideomycetes (Fig. 20) in the order Pleosporales. The new family Macrovalsariaceae is introduced to accommodate the monotypic genus *Macrovalsaria* typified by *M. leonensis*. Macrovalsariaceae has dark brown to black *ascostromata*, cylindro-clavate with a short fine pedicel asci and elliptical to fusoid with skull cap-like germ apparatus at the lower end ascospores.

Macrovalsaria leonensis (Deighton) Petr., Sydowia 15(1-6): 298 (1962) [1961] Fig. 21

≡ *Valsaria leonensis* Deighton, Sydowia 6(5-6): 321 (1952)

Index Fungorum number: IF 333867; Facesoffungi number: FoF 06251

Current name: *Macrovalsaria megalospora* (Mont.) Sivan. Trans. Br. Mycol. Soc. 65: 400 (1975)

Saprobic on dead branches of *Caesalpinia sappan* L. Sexual morph: *Ascostromata* 635–1010 µm high × 882–1015 µm diam., dark brown to black, immersed to erumpent, solitary to a few in a

group, carbonaceous, oblate, spheroid to subsphaerical, with a central ostiole. *Peridium* comprising brown and small-celled *textura angularis*. *Asci* 192–198 × 31–41 µm ($\bar{x}$ = 195.9 × 36.1, n = 20), 8-spored, bitunicate, fissitunicate, cylindro-clavate, with a short fine pedicel, apically rounded with a small ocular chamber. *Paraphyses* 3–6 µm wide, unbranched, tapering upwards, apically free. *Ascospores* 38–40 µm × 14–18 µm ($\bar{x}$ = 38.8 × 16.6 µm, n = 20), uniseriate to irregularly uniseriate, 1-septate, brown, elliptical-fusoid, slightly constricted at septum, with skull cap-like germ apparatus at the lower end, transverse striation near the center of lower cell with longitudinal striations from transverse striation to the end cell, surface smooth, granular to verrucose. Asexual morph: Undetermined.

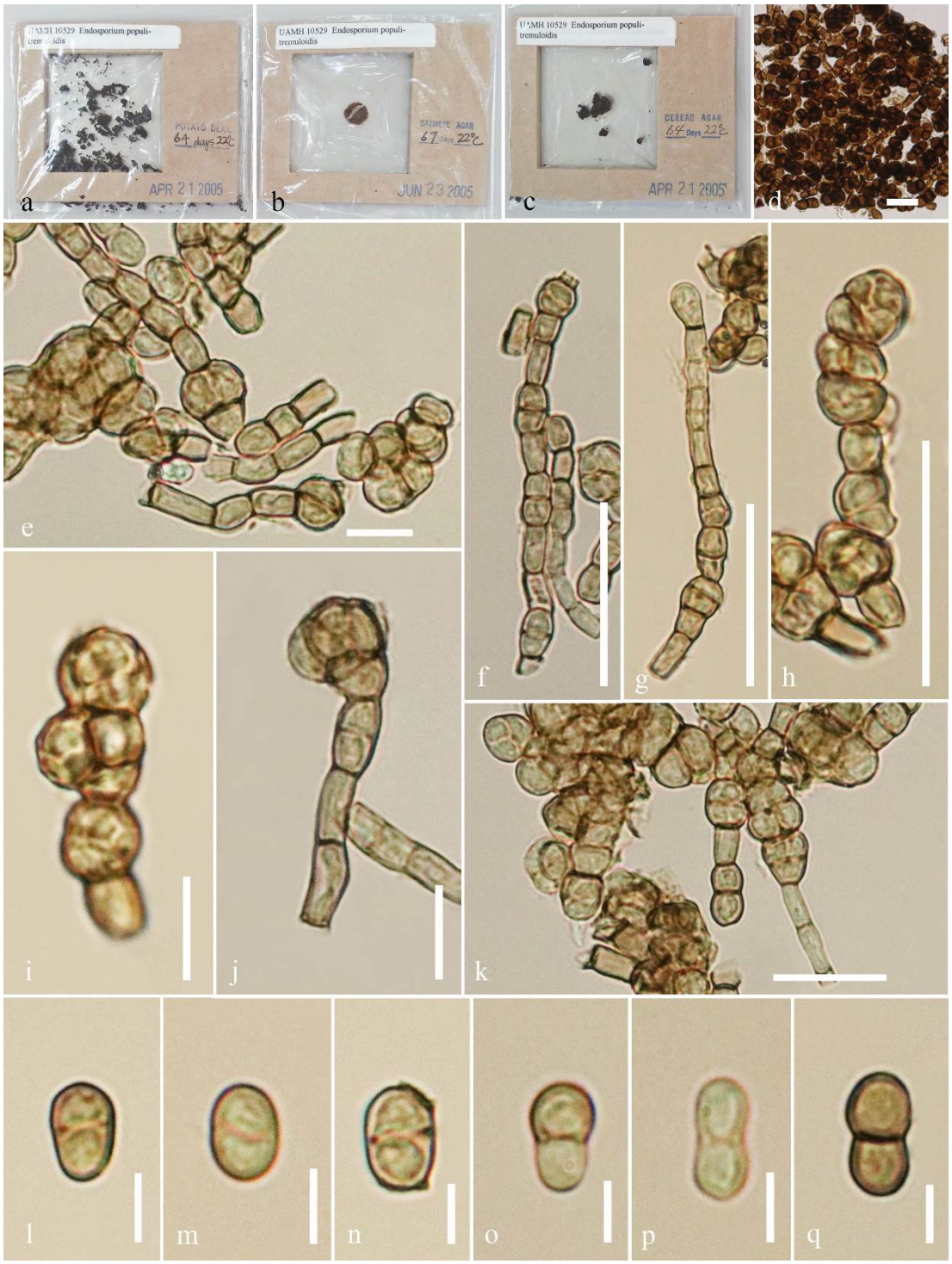

Figure 19 – ***Endosporium populi-tremuloides*** (UAMH 10529, holotype). a–c Details of herbarium material. d Squash mount of mycelium. e–k Hyphae giving rise to cellular clumps. i, j Cellular

clumps and unicellular endoconidia. l–q Blastic conidia. Scale bars: d, e = 20 µm, f–h = 30 µm, i–k = 10 µm, l–q = 5 µm.

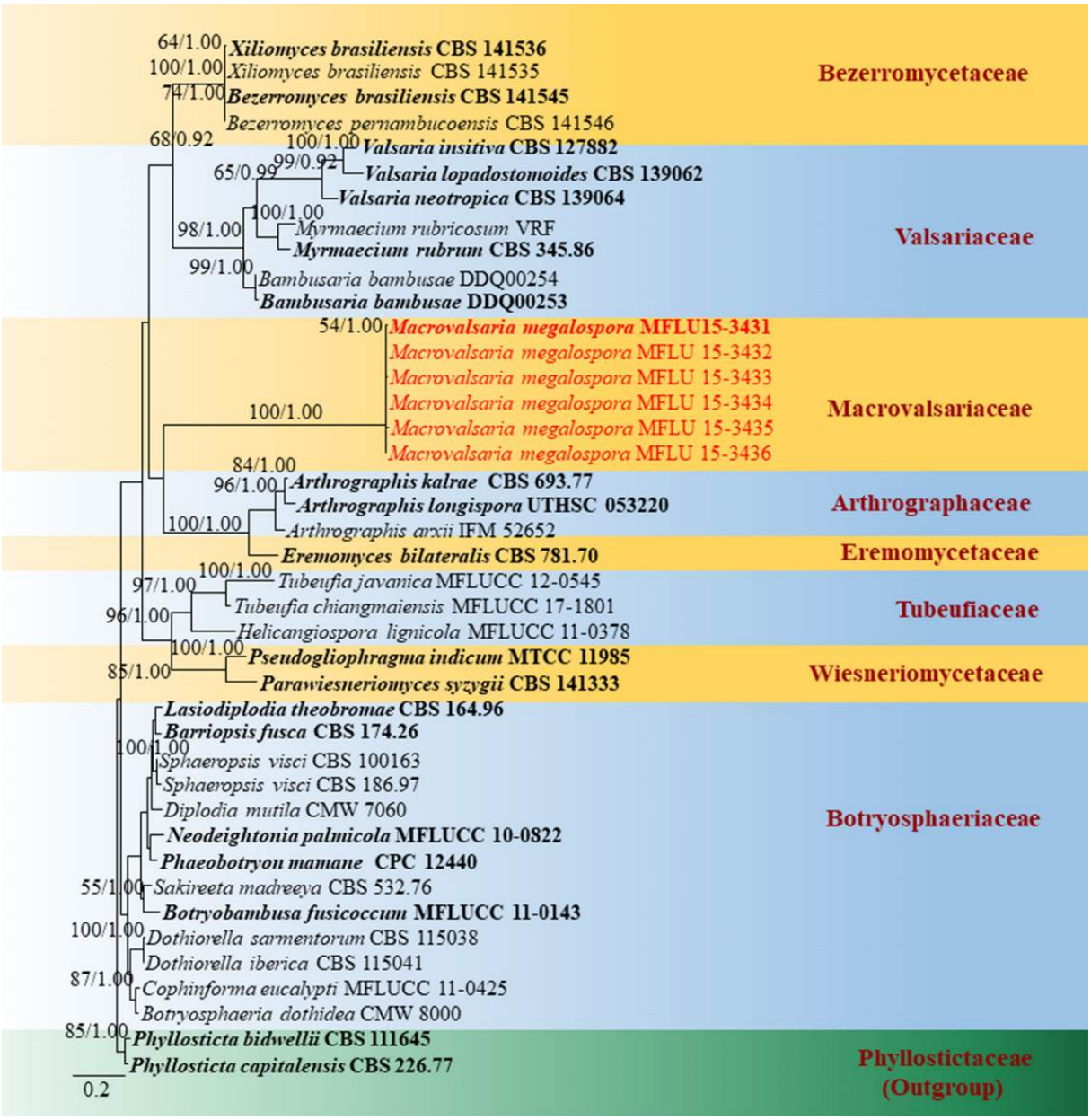

Figure 20 – Phylogram generated from maximum likelihood analysis based on ITS sequence data retrieved from the GenBank. Related sequences were referred to Liu et al. (2017) and Doilom et al. (2017). Forty-one taxa are included in the genes sequence analyses which comprise total 722 characters after alignment. *Endomelanconiopsis endophytica* (CBS 120397) and *Endomelanconiopsis microspora* (CBS 353.97) are used as the out-group taxa. Maximum likelihood (ML) analysis was conducted in the CIPRES Science Gateway V. 3.3. The best sorting RaXML tree with a final likelihood value of -7272.381820 is presented. Estimated base frequencies were as follows: A = 0.216346, C = 0.295906, G = 0.263865, T = 0.223882; substitution rates AC = 1.268131, AG = 2.046492, AT= 1.609300, CG = 1.315693, CT = 3.295166, GT = 1.000000; gamma distribution shape parameter α = 1.183469; proportion of invariant 0.261792. ML bootstrap values ≥ 50% are given as the first set of numbers and approximate likelihood-ratio test (aLRT) ≥ 0.90 values as the second set of numbers above the nodes. Voucher/strain numbers are given after the taxon names, the one from type material are indicated in bold face. Sequence of interest is indicated in red. The bar length indicates the number of nucleotide substitutions per site.

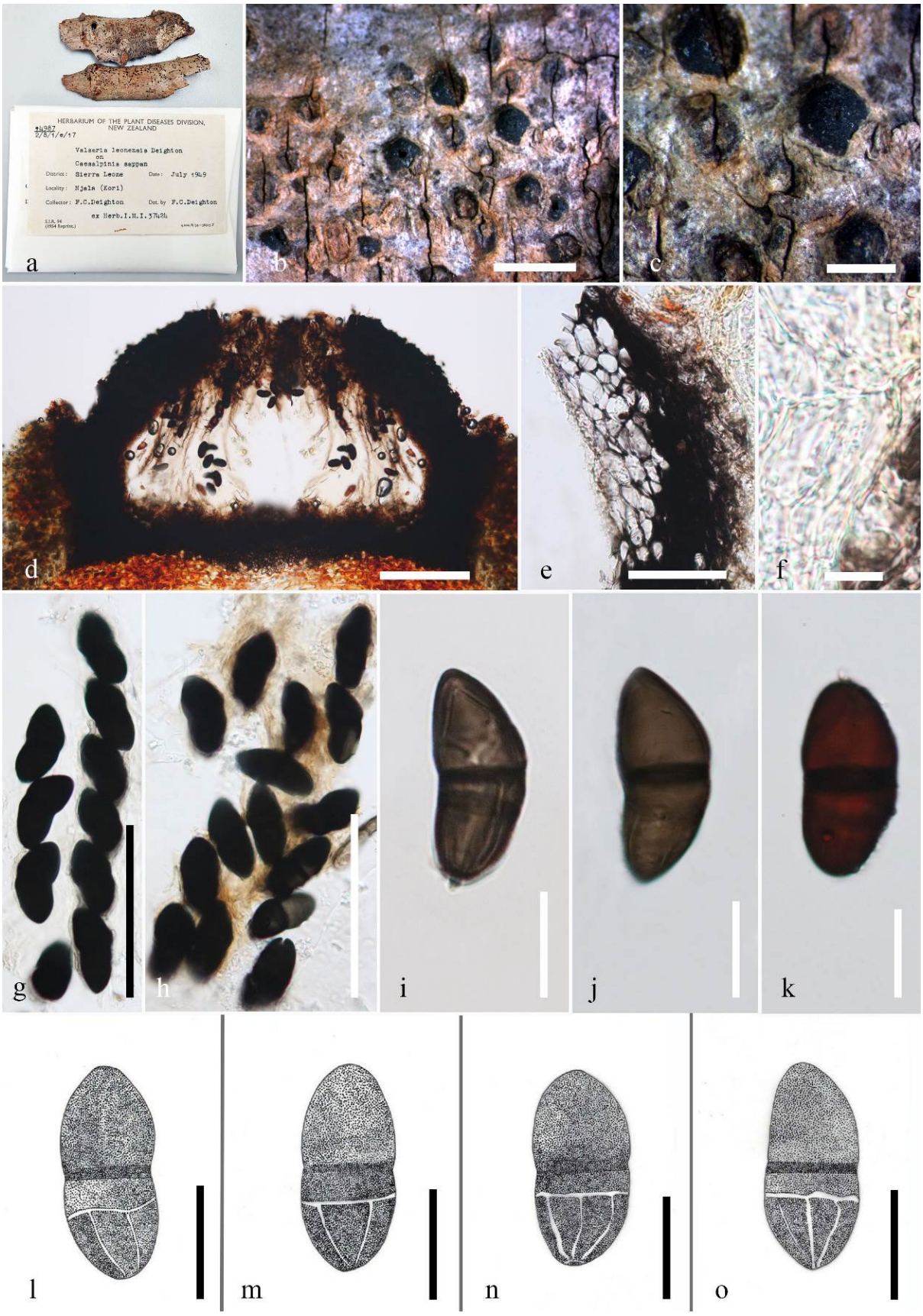

Figure 21 – *Macrovalsaria leonensis* (PDD 14987, co-extype). a Details of herbarium material. b, c Habit and appearance of ascomata on host surface. d Section of ascoma. e Peridium. f Hamathecium g, h. Asci. i–o Ascospores. Scale bars: b = 2 mm, c = 1 mm, d = 200 µm, e = 40 µm, f = 10 µm, g, h = 100 µm, i–o = 20 µm.

Material examined – AFRICA, Sierra Leone, Njala (Kori), on dead branches of *Caesalpinia sappan* (Fabaceae), 12 July 1949, F.C Deighton (PDD 14987, co-extype).

Economic significance – None is reported.

Naetrocymbaceae Höhn.

Bonaria Bat., Publicações Inst. Micol. Recife 56: 438 (1959)

Foliar epiphyte on upper and lower surface of living leaves, forming black rounded spots. Mycelium superficial, not apparently penetrating host cells. Sexual morph: *Thyriothecia* circular, solitary or in groups, gregarious, superficial, carbonaceous, dark brown to black, ostiolate. *Peridium* comprising a single stratum of black-brown cells of closely arranged *textura angularis*. *Hamathecium* comprising asci embedded in pseudoparaphyses. *Asci* 6-spored, bitunicate, fissitunicate, saccate, globose or subglobose to oblong, apedicellate, apically rounded and endotunica thick-walled near apex without a distinct ocular chamber. *Ascospores* 2 or 4 seriate, elongate-ellipsoidal, hyaline, 2-celled, slightly constricted at the septum, lower cells slightly longer than upper cell, appearing rough-walled. Asexual morph: Undetermined.

Type species – *Bonaria lithocarpi* (V.A.M. Mill. & Bonar) Bat.

Notes – The monotypic genus *Bonaria* was introduced by Batista to accommodate *Bonaria lithocarpi* (≡ *Protopeltis lithocarpi*) as the type species. It was placed in the family Micropeltidaceae in Lumbsch & Huhndorf (2010), however, later, Hyde et al. (2013) excluded the genus from Micropeltidaceae and Wijayawardene et al. (2018) treated the genus in Dothideomycetes, genera *incertae sedis*. Currently, two other species are accepted in the genus namely, *Bonaria chandleri* (Hansf.) Bat. and *Bonaria phyllanthi* Bat. & C.A.A. Based on the morphological characters, *B. lithocarpi* shares similar characters to species in Naetrocymbaceae (Hyde et al. 2013, Doilom et al. 2018) such as immersed, subglobose, black ascomata, 8-spored, bitunicate, thick-walled, obpyriform asci and multi-seriate, oblong to long ellipsoid, hyaline, 1-septate ascospores. Based on morphological data and unavailability of sequence data, we tentatively place *Bonaria* in Naetrocymbaceae.

Bonaria lithocarpi (V.A.M. Mill. & Bonar) Bat., Publicações Inst. Micol. Recife 56: 439 (1959)
Fig. 22

≡ *Protopeltis lithocarpi* V.A.M. Mill. & Bonar, University of Calif. Publ. Bot. 19: 412 (1941)

Index Fungorum number: IF 293763; Facesoffungi number: FoF 05164

Epifoliar on upper and lower surface of living leaves of *Lithocarpus densiflora*, forming black rounded spots. Mycelium superficial, not apparently penetrating host cells. *Thyriothecia* 32–37 μm high × 148–161 μm diam., circular, solitary or in groups, gregarious, superficial, carbonaceous, dark brown to black, ostiolate. *Peridium* 6–15 μm wide, comprising a single stratum of black-brown cells of closely arranged *textura angularis*. *Hamathecium* comprising asci embedded in pseudoparaphyses. *Asci* 15–26 μm × 17–25 μm ($\bar{x}$ = 21.3–21.4 μm, n = 10), 6-spored, bitunicate, fissitunicate, saccate, globose or subglobose to oblong, apedicellate, apically rounded and endotunica thick-walled near apex without a distinct ocular chamber. *Ascospores* 14–15 μm × 2–3 μm ($\bar{x}$ = 14.7 × 3.3 μm, n = 10), 2 or 4 seriate, elongate-ellipsoidal, hyaline, 2–celled, slightly constricted at the septum, lower cells slightly longer than upper cell, appearing rough-walled. Asexual morph: undetermined.

Material examined – USA, California, Marin, near Inverness, on *Lithocarpus densiflora* (Fagaceae), March 1931, H.E. Parks. (S-F 3573, isotype).

Notes – *Protopeltis lithocarpi* was described by Miller & Bonaria (1941). Later, *Protopeltis* was listed as a synonym of *Myriangiella* in Schizothyriaceae (von Arx & Müller 1975) and *Bonaria* was listed as a valid genus in Micropeltidaceae in Lumbsch & Huhndorf (2010).

Economic significance – The genus *Bonaria* consists of non-obligate parasites which have been reported on stems of *Lachnum marginatum* (Cooke) Raitv (Momei 2003).

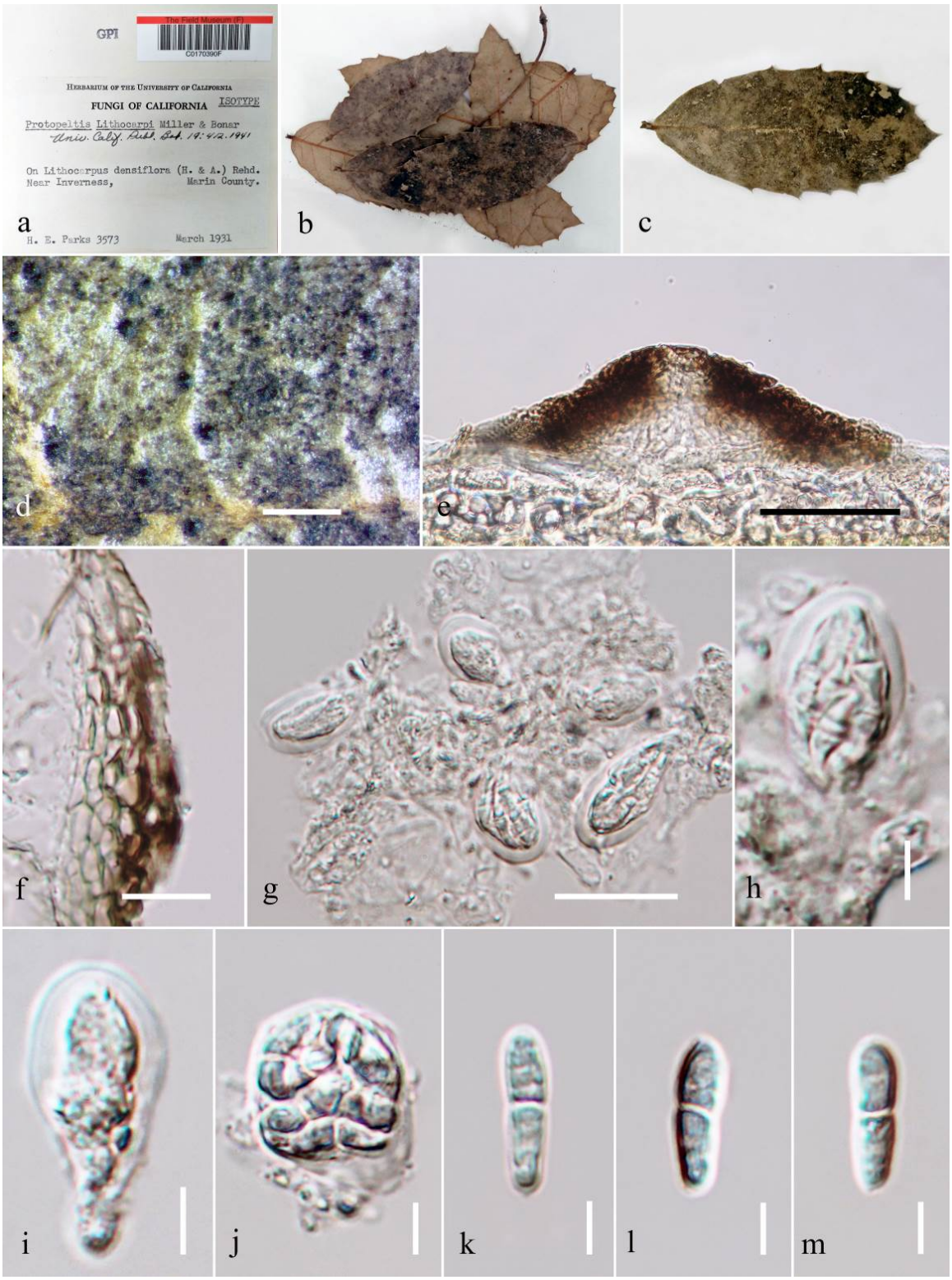

Figure 22 – *Bonaria lithocarpi* (S-F 3573, isotype) a–c Herbarium specimen and habit on leaf. d Appearance of ascomata on the host surface. e Section of ascoma. f Peridium g Asci embedded in pseudoparaphyses. h–j Asci. k–m Ascospores. Scale bars: d = 500 µm, f = 10 µm, e, g = 20 µm, h–m = 5 µm.

Perisporiopsidaceae E. Müll. & Arx
Asteronia (Sacc.) Henn., Hedwigia 34: 104 (1895)
≡ *Asterina* subgen. *Asteronia* Sacc., Syll. fung. (Abellini) 1: 47 (1882)

Parasitic or pathogenic on living leaves of *Sweetia* sp. Sexual morph: *Colonies* forming darkened regions on the underside of leaves, similar to a "sooty mold". *Ascomata* gregarious, solitary or some scattered, superficial, globose, subglobose to ovate, subcoriaceous, brown to black-brown, with an indistinct ostiole. *Peridium* comprising one layer of black-brown isodiametric cells of *textura angularis*. *Hamathecium* not apparent. *Asci* 8-spored, bitunicate, oblong to broadly cylindrical, with a short indistinct pedicellate or sometime sessile, apically rounded and thickened, with an indistinct ocular chamber. *Ascospores* tri to multiseriate, guttulate, thin-walled, straight or slightly curved, fusoid-ellipsoidal, widest in the middle part of the apical cell, with broadly rounded apex and tapering to a narrowly rounded base, hyaline, 1-septate, septum nearly central but nearer to apex, rough-walled. Asexual morph: Undetermined.

Type species – *Asteronia sweetiae* Henn.

Notes – *Asteronia* was introduced as a monotypic genus with *Asteronia sweetiae* as the type species. Consequently, Hennings (1908) added *A. lauraceae* Henn. to the genus. Currently, two species are accommodated in the genus. There is no report of the asexual morph. The genus *Asteronia* was previously placed in Microthyriaceae by Lumbsch & Hundorf (2010). Later, Hyde et al. (2013) transferred the genus to *Dothideomycetes* genera *incertae sedis*. The genus is characterised by an ascoma that are subglobose and gregarious, and 8-spored asci that are bitunicate with fusoid-ellipsoidal ascospores. Cultures and sequences are unavailable. We re-examined the type specimen of *Asteronia sweetiae*. The globose ostiolate ascomata formed on black mycelium and lack of flattened thyriothecia indicate that the genus *Asteronia* does not belong to Microthyriaceae, but is probably a member of Perisporiopsidaceae. The fact that the morphological characters of the genus *Asteronia* fits well within the species concept of Perisporiopsidaceae in having superficial ascomata with surrounding mycelia, and ellipsoidal oblong, 1 septate, hyaline ascospores, we transfer the genus *Asteronia* to the family Perisporiopsidaceae.

Asteronia sweetiae Henn., Hedwigia 34: 104 (1895) Fig. 23

= *Parodiopsis sweetiae* (Henn.) G. Arnaud, Annls Épiphyt. 7: 53 (1921)

Index Fungorum number: IF 229114; Facesoffungi number: FoF 06215

Parasitic or *pathogenic* on living leaves of *Sweetia* sp. Sexual morph: *Colonies* forming darkened regions on the underside of leaves, similar to a "sooty mold". *Ascomata* 74–92 µm high × 67–74 µm diam., gregarious, solitary or some scattered, superficial, globose, subglobose to ovate, subcoriaceous, brown to black–brown, with an indistinct ostiole. *Peridium* 30–36 µm wide, comprising one layer of black-brown isodiametric cells of *textura angularis*. *Hamathecium* not apparent. *Asci* 60–93 µm × 20–27 µm ($\bar{x}$ = 72 × 23 µm), 8-spored, bitunicate, oblong to broadly cylindrical, with a short indistinct pedicellate or sometime sessile, 8–9 µm long, 6.5–7.5 µm wide, apically rounded and thickened, with an indistinct ocular chamber. *Ascospores* 33–46 µm × 4–6.5 µm ($\bar{x}$ = 41 × 5 µm), tri to multi-seriate, guttulate, thin-walled, straight or slightly curved, fusoid-ellipsoidal, widest in the middle part of the apical cell, with broadly rounded apex and tapering to a narrowly rounded base, hyaline, 1-septate, septum nearly central but nearer to apex, rough-walled. Asexual morph: Undetermined.

Material examined – BRAZIL, Estado de Minas Gerais, on leaves of *Sweetia* sp. (Fabaceae), June 1892, E. Ulé (S-F46114, isotype).

Economic significance – The genus *Asteronia* is associated with dead and living leaves of mostly tropical plants and comprised pathogens, saprobes or epiphytes (Boonmee et al. 2017).

Byssocallis Syd. Annls mycol. 25(1/2): 14 (1927)

Parasitic on mycelium of *Meliolaceae* on leaves of *Phoebes jonduzii*. Sexual morph: *Ascomata* superficial, distributed throughout upper and lower surface of leaf, solitary, subglobose-globose, light yellow to orange-brown, with an opening at the centre, concealed with light brown mycelia. *Peridium* comprising 3–4 layers of pale yellow cells of closely arranged *textura angularis*. *Hamathecium* 1–1.5 µm wide comprising numerous filiform, branched, septate pseudoparaphyses embedded in a gelatinous matrix. *Asci* 8-spored, bitunicate, cylindrical to clavate, slightly curved,

short pedicellate, apically rounded with a small ocular chamber. *Ascospores* fusiform to clavate, upper part wider than lower part, 3-transversely septate, slightly constricted at the septa, hyaline to grayish, slightly granulated, smooth-walled. Asexual morph: Undetermined.

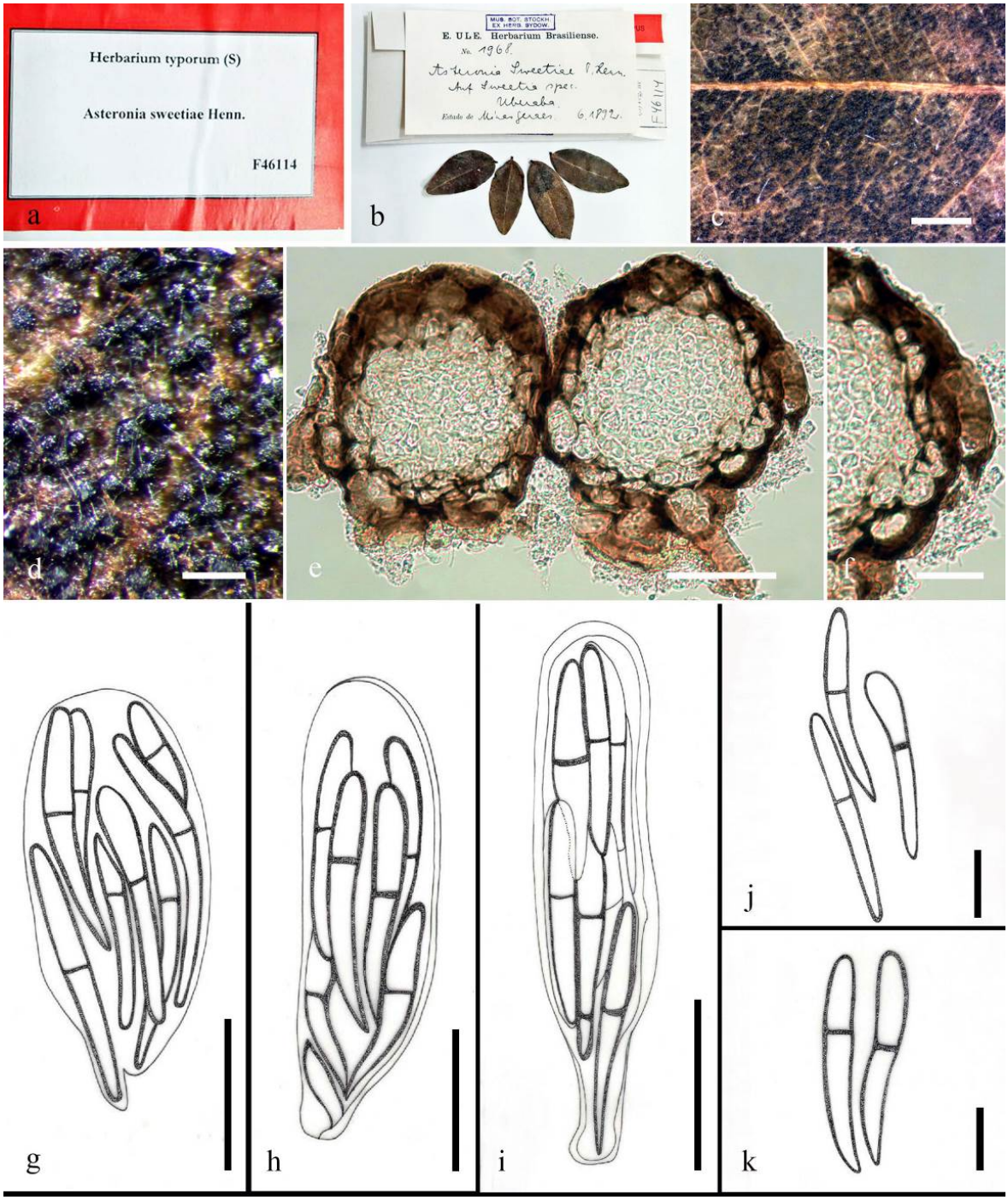

Figure 23 – *Asteronia sweetiae* (S-F46114, isotype). a, b Details of herbarium material. c, d Habit and appearance of ascomata on host surface. e Section of ascomata. f Peridium. g–i Asci. j, k Ascospores. Scale bars: c = 1 mm, d = 200 µm, e = 50 µm, f–i = 20 µm, j, k = 10 µm.

Type species – *Byssocallis phoebes* Syd.

Notes – *Byssocallis* was introduced with two species *B. capensis* (Doidge) Rossman and *Byssocallis phoebes* Syd. The genus is characterized by reticulate, branched, and septate hyphae with colorless mycelium covering the host. Perithecia are solitary to gregarious, superficial, ostiolate with smooth walls. Paraphyses are numerous, narrow, branched with mucous membrane.

Asci are cylindrical, bitunicate, octosporous. Ascospores are clavate, narrowly fusiform, transverse, hyaline, and multiseptate with the ends often constricted. Species in *Byssocallis* were found similar to those in *Melioliphila* except they possess luteous granules in outer cell walls of the ascocarps and hyphae forming the stroma. *Byssocallis* was previously synonymised with *Puttemansia* by Petrak (1931) and Pirozynski (1977) based on the presence of apiculate ascospores (Rossman 1987). *Byssocallis* was accepted as a genus in Tubeufiaceae (Lumbsch & Huhndorf 2010). Upon further study, the genus *Byssocallis* was transferred to Dothideomycetes, genera *incertae sedis* (Hyde et al. 2013, Boonmee et al. 2014, Kirk et al. 2013, Wijayawardene et al. 2014). The asexual morph of this genus is unknown. We re-examined the syntype of *Byssocallis phoebes* and found similar morphological characters with species accommodated in the family Perisporiopsidaceae. Boonmee et al. (2017) revised the family Perisporiopsidaceae which is characterized by "superficial ascomata with surrounding mycelia, and ellipsoidal oblong, 1 or more septate, hyaline ascospores". Therefore, the genus should be placed in Perisporiopsidaceae (= Parodiopsidaceae) based on morphology.

Byssocallis phoebes Syd., Annls mycol. 25(1/2): 14 (1927) Fig. 24

Index Fungorum number: IF 274271; Facesoffungi number: FoF 06224

Parasitic on mycelium of leaves of *Phoebes jonduzii*. Sexual morph: *Ascomata* 92–113 μm high × 105–117 μm diam. ($\overline{x}$ = 103.1 × 111.4 μm, n = 10) superficial, distributed throughout upper and lower surface of leaf, solitary, subglobose-globose, light yellow to orange-brown, with an opening at the centre, concealed with light brown mycelia. *Peridium* 22–25 μm thick, comprising 3–4 layers of pale yellow cells of closely arranged *textura angularis*. *Hamathecium* 1–1.5 μm wide comprising numerous filiform, branched, septate pseudoparaphyses embedded in a gelatinous matrix. *Asci* 69–74 μm × 15–18 μm ($\overline{x}$ = 71.5 × 16.8 μm, n = 10), 8-spored, bitunicate, cylindrical to clavate, slightly curved, short pedicellate, apically rounded with a small ocular chamber. *Ascospores* 28–31 μm × 8.4–9.1 μm ($\overline{x}$ = 29.7 × 8.7 μm, n = 20), fusiform to clavate, wedge-shaped, upper part wider than lower part, 3- transversely septate, slightly constricted at the septa, hyaline to grayish, slightly granulate, smooth-walled. Asexual morph: Undetermined.

Material examined – COSTA RICA, Central America, San Pedro de San Ramon, Provincia de San José on *Phoebe costaricanus* (Lauraceae), 23 January 1925, H. Sydow (E00455471, syntype).

Economic significance – The genus *Byssocallis* is parasitic and has been reported to cause disease leaves that occur in Meliolaceae (Boonmee et al. 2011).

Vizellaceae H.J. Swart 1971

Acarella Syd., Annls mycol. 25(1/2): 123 (1927)

Parasitic or *epiphytic* on the surface of living leaves. Sexual morph: Undetermined. Asexual morph: *Pycnidia* hypophyllous, dark brown to black, superficial, in groups with irregular margins, sometimes sparsely scattered or not entirely distributed on surface of leaves. *Conidiophores* straight or slightly curved, hyaline, mostly reduced to conidiogenous cells. *Conidiogenous cells* phialidic or enteroblastic-percurrent, cylindrical to elliptical, septate, rough and thick-walled. *Conidia* ellipsoidal to cylindrical, solitary, hyaline to olivaceous-brown, 1-septate, apparently with 2-guttules.

Type species – *Acarella costaricensis* Syd.

Notes – The genus *Acarella* was described and introduced by Sydow (1927) with the type species, *A. costaricensis. Acarella costaricensis* was found on unidentified leaves in San Pedro de San Ramon, Peru. Morphologically, this genus is characterized by scattered, small and completely superficial pycnidia with a thin peridium. Conidia are ellipsoid to cylindrical. The sexual morph of this genus is unknown. Species of *Acarella* are distributed in Central America (Wijayawardene et al. 2017). Cultures and sequences are unavailable. *Acarella costaricensis* and *Perizomella inquinans* were isolated from *Phoebe costaricana* in Costa Rica and is morphologically similar in having ovoid to ellipsoidal or rarely subglobose, brown to dark brown conidia, with transverse

hyaline band, formed on phialidic, hyaline conidiogenous cells lining the inner cavity of the upper wall. Therefore, considering the host relationship and morphological characters, the species *Acarella costaricensis* and *Perizomella inquinans* are synonymised. We therefore transfer the genus *Acarella* (=*Perizomella*) to the family Vizellaceae whereby the asexual species exhibit ovoid to ellipsoidal or rarely subglobose, brown to dark brown, with transverse hyaline band, formed on phialidic, hyaline cells lining the inner cavity of the upper wall (Hyde et al. 2013).

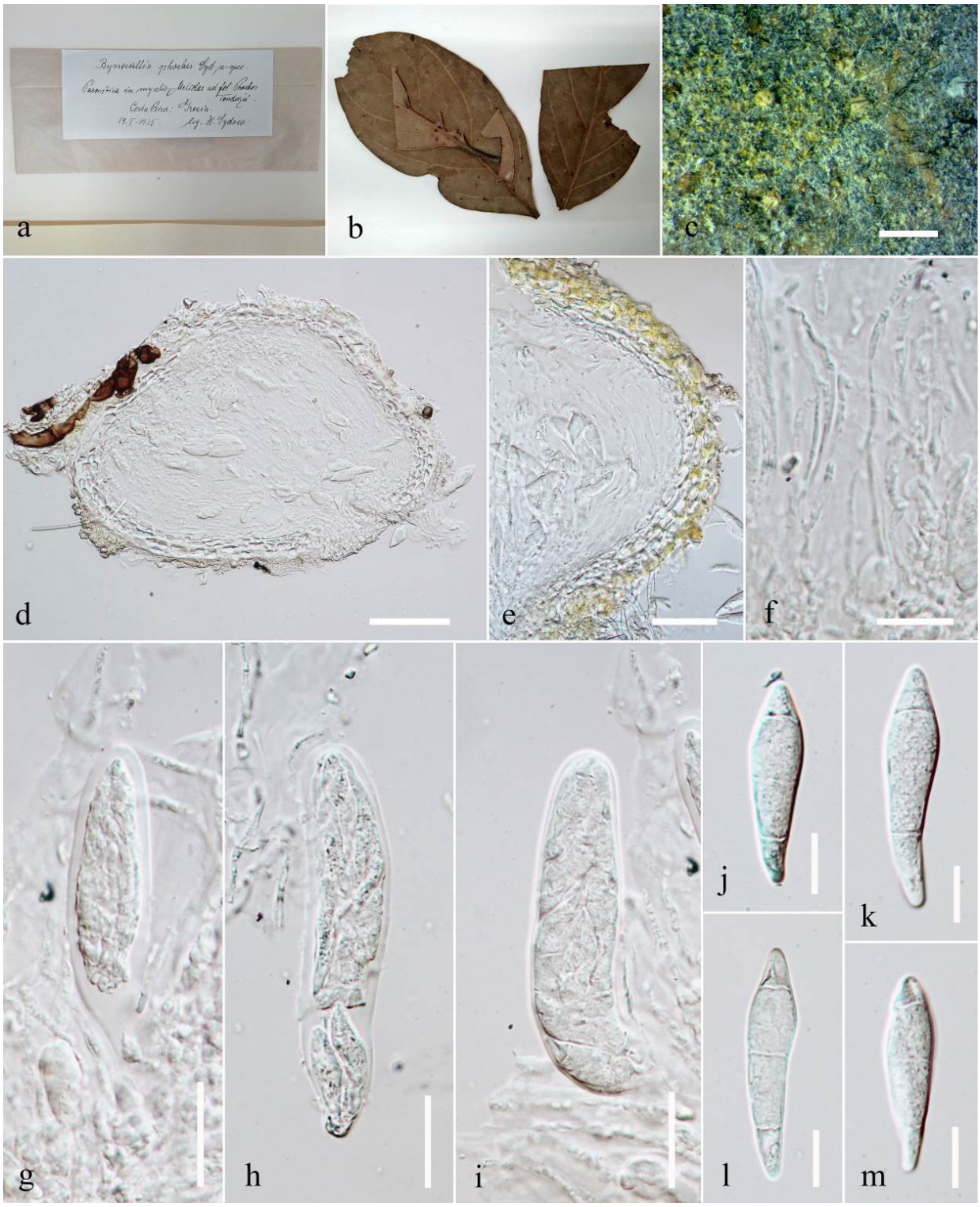

Figure 24 – *Byssocallis phoebes* (E00455471, syntype). a–c Herbarium specimen and habit on leaf. d Section of an ascoma. e Peridium. f Hamathecium. g–i Asci. j–m Ascospores. Scale bars: c = 500 µm, d = 50 µm, e–i = 20 µm, j–m = 10 µm.

Acarella costaricensis Syd. Annls mycol. 25(1/2): 123 (1927) Fig. 25

Index Fungorum number: IF 262145; Facesoffungi number: FoF 06207

Parasitic or *epiphytic* on the surface of living leaves of *Phoebe costaricanus*. Sexual morph: Undetermined. Asexual morph: *Conidiomata* 58–110 µm high × 36–130 µm diam., ($\overline{x}$ = 20.5 × 4 µm, n = 10), pycnidial, hypophyllous, dark brown to black, superficial, in groups with irregular margins, sometimes sparsely scattered or not entirely distributed on surface of leaves. *Conidiophores* 11–26 µm high, 3–5 µm wide ($\overline{x}$ = 20.5 × 4 µm, n = 10) straight or slightly curved, hyaline, reduced to conidiogenous cells. *Conidiogenous cells* phialidic or enteroblastic percurrent, cylindrical to elliptical, septate, rough and thick-walled. *Conidia* 5–6 × 2–3 µm ($\overline{x}$ = 5 × 3 µm, n = 10), ellipsoidal to cylindrical, solitary, hyaline to olivaceous-brown, 1-septate, apparently with 2-guttules.

Material examined – COSTA RICA, Central America, San Pedro de San ramon, Provincia de San José on *Phoebe costaricanus* sp. (Lauraceae), 23 January 1925, H. Sydow (E00455227, holotype).

Economic significance – The genus *Acarella* consist of species with neotropical distribution and form stalked appressoria. They infect the host manifesting as dark brown spots on leaf surfaces (Hofmann 2009). There is no molecular data available for the taxon.

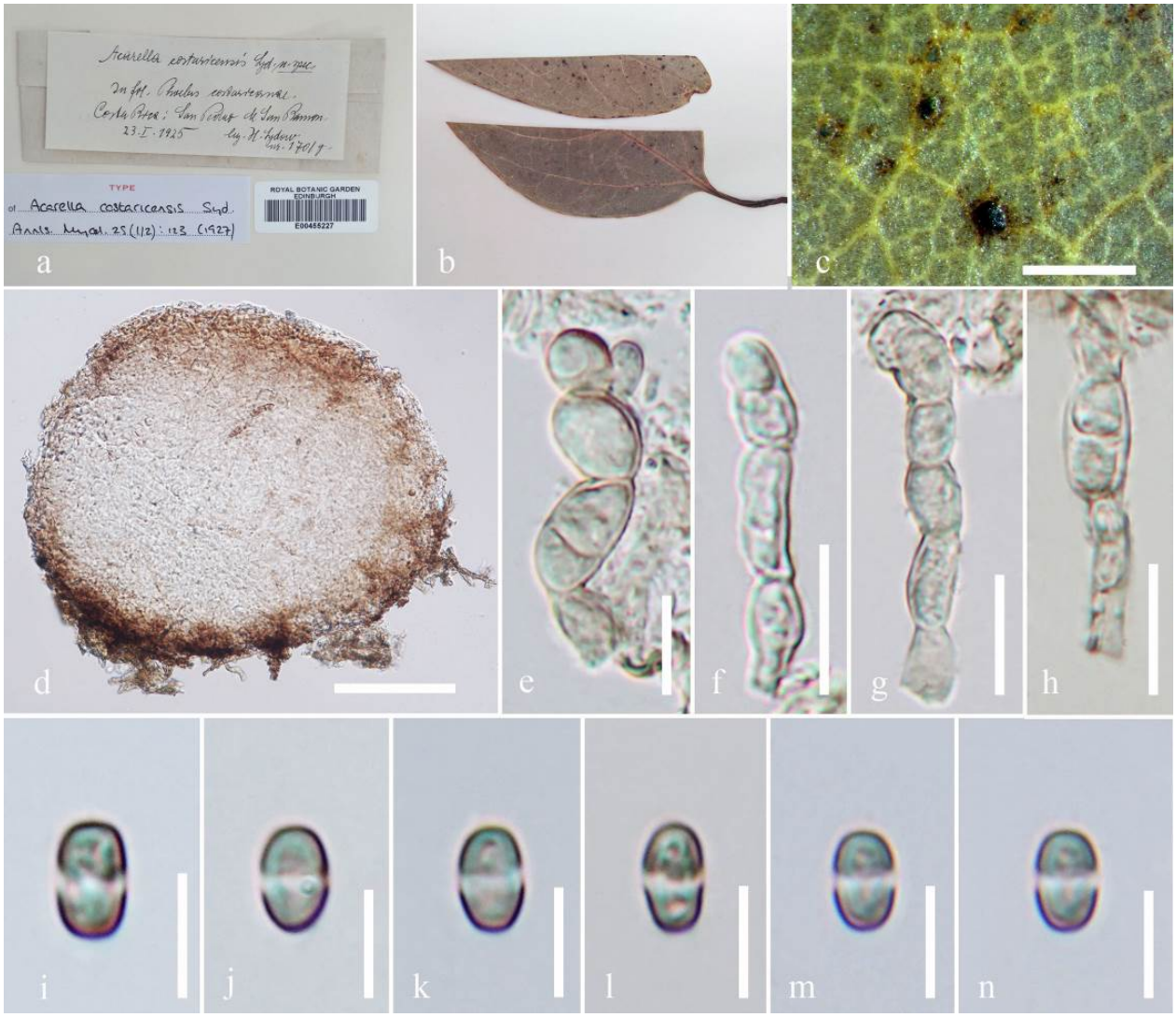

Figure 25 – *Acarella costaricensis* (E00455227, holotype). a–c Herbarium specimen and habit on leaf. d Section of conidioma. e–h Conidiogenous cells and conidiogenesis. i–n Conidia. Scale bars: c = 500 µm, d = 100 µm, e–h = 10 µm, i–n = 5 µm.

Dothideomycetes, genera *incertae sedis*

Achorella Theiss. & Syd. Annls mycol. 13(3/4): 340 (1915)

Parasitic or *epiphytic* on the surface of living leaves. Sexual morph: Undetermined. Asexual morph: *Conidiomata* pycnidial, eustromatic, superficial, multilocular, black, subglobose, aggregated, thick-walled; walls composed of dark brown *textura angularis*. *Conidiophores* hyaline, cylindrical, reduced to conidiogenous cells. *Conidiogenous cells* phialidic, cylindrical, 1-septate. *Conidia* hyaline, 2-celled, septate, cylindrical, apical obtuse, smooth-walled with tiny setula or appendage.

Type species – *Achorella ametableta* (Rehm).

Notes – The genus *Achorella* was described and introduced by Theissen and Sydow (1915) with *A. ametableta* as the type species. *Achorella ametableta* was found on *Baccharis* (Asteraceae) stems in Brazil and is characterized by globose locules with the perithecial protuberances immersed in the stroma. Locules are spherical to pear-shaped with a short neck. Paraphyses are numerous, thin, cylindrical and filamentous. Ascospores are spindle shaped-constricted on both sides tapered in the middle, brown. It was earlier placed in the *Dothideae*, within the order Dothideales (Clement 1931), but is now in Dothideomycetes, genera *incertae sedis* (Wijayawardene et al. 2018). There are currently ten species in this genus. Cultures and sequences are unavailable. The growth of superficial mycelium along with the free perithecium-like protuberances are similar to characters of the species in the Dothideales and of the Perisporiaceae though its closest relation is with the former. The specimen that we observed was in poor condition hence we treat this taxa as doubtful until the fungus is recollected.

Achorella ametableta (Rehm) Theiss. & Syd, Annls mycol. 13(3/4): 340 (1915)

≡ *Dothidella ametableta* Rehm, Hedwigia 36: 376 (1897)

Index Fungorum number: IF 145625; Facesoffungi number: FoF 06208 Fig. 26

Parasitic or *epiphytic* on the surface of living leaves of *Baccharis*. Sexual morph: Undetermined. Asexual morph: *Conidiomata* 100–150 high × 140−170 µm diam., ($\overline{x}$ = 125 × 150 µm, n = 10), pycnidial, eustromatic, superficial, multilocular, black, subglobose, aggregated, thick–walled; walls composed of dark brown *textura angularis*. *Conidiophores* hyaline, cylindrical, reduced to conidiogenous cells. *Conidiogenous cells* 5−7 µm × 2−4 µm ($\overline{x}$ = 6 × 3 µm, n = 10), phialidic, cylindrical, 1-septate. *Conidia* 8–15 µm × 2–5 µm ($\overline{x}$ = 11 × 4 µm, n = 20), hyaline, 2-celled, septate, cylindrical, apical obtuse, smooth-walled with tiny setula or appendage.

Material examined – BRAZIL, Brasilia, Padres Grandes, on *Baccharis* sp (Asteraceae), August 1880, E. Ule (S-F 47804, holotype).

Economic significance – The genus *Achorella* is markedly parasitic, causing well defined diseased spots on the host (Steven 1923). The genus has been reported to cause disease in Cohune palm seeds (Janick & Paull 2008).

Alascospora Raja, Violi & Shearer**,** Mycologia 102(1): 33 (2010)

Saprobic on petiole of *Nymphaea odorata*. Sexual morph: *Ascomata* superficial to partly immersed, scattered, globose, subglobose or hemispherical and flattened at the base, membranaceous, ostiolate, light brown, translucent when young, darkening with age. *Peridium* composed of hyaline to brown pseudoparenchymatic cells, with dark brown amorphous material deposited irregularly on the peridial surface, especially dense around the ostiole. *Pseudoparaphyses* sparsely branched, hyaline to brown, septate, filamentous, cylindrical, at times irregular, sometimes constricted at the septa. *Asci* bitunicate, fissitunicate, multiguttulate, thick-walled, globose to subglobose, short, pedicellate, containing eight irregularly arranged ascospores, without an ocular chamber, rounded at the apex. *Ascospores* ellipsoidal, 1-septate, septum thin, hyaline when immature becoming dark brown when mature, upper cell longer and wider than lower cell, with apical papillae and appressed sheath outlining the ascospores. Asexual morph: Undetermined.

Type species – *Alascospora evergladensis* Raja, Violi & Shearer

Figure 26 – *Achorella ametableta* (S-F47804, holotype). a–b Herbarium material. c–d Stroma. e Peridium. f Cross section of conidioma. g Conidia with conidiogenous cell. h–i Conidia, arrow showing tiny setula. Scale bars: c = 1000 µm, d = 500 µm, e, f = 50 µm, g–l = 10 µm.

Notes – The monotypic genus *Alascospora* was described and introduced by Raja et al. (2010) with type species, *Alascospora evergladensis*. The latter was found on petiole of *Nymphaea odorata* submerged in freshwater in Florida and is characterized by light brown, translucent, membranous, ostiolate ascomata, with dark, amorphous material irregularly deposited on the peridium, near the ostiole; globose, fissitunicate, thick-walled asci; septate pseudoparaphyses; and 1-septate ascospores that are hyaline when immature, and surrounded by a hyaline gelatinous sheath that is wing-shaped and bordered on each side of the ascospores. This genus is also unique

in its translucent sheath of ascospores which first swells in water and then condenses and darkens around mature ascospores, giving them a dark brown, verruculose look. *Alascospora* has been compared with *Zopfia* Rabenh, *Pontoporeia* (Durieu & Mont.) Kohlm., and *Zopfiofoveola* D. Hawksw, *Caryospora* de Not., in the family *Zopfiacea*e, as well as *Testudina* Bizz. and *Verruculina* Kohlm. & Volkm.-Kohlm. in family *Testudinaceae*. The asexual morph of this genus is unknown. Wijayawardene et al. (2017) placed this genus in Dothideomycetes genera *incertae sedis*. Cultures and sequences are unavailable. We re-examined the microslide of holotype from ILL herbarium under the code ILL40789. Raja et al. (2010) reported the presence of a translucent gelatinous sheath appearing as lateral wings in the border of immature ascospores. However, we could not observe this character from the type material as the microslide was not in good condition. The genus *Alascospora* is distinct from all other genera of the class Dothideomycetes. However, *Alascospora* can be compared to *Natipusilla* to some extent in having aquatic lifestyle, superficial globose ascomata, absence of pseudoparaphyses and ascospores surrounded by sheath. We retain the genus *Alascospora* in Dothideomycetes, genera *incertae sedis*.

Alascospora evergladensis Raja, Violi & Shearer, Mycologia 102(1): 36 (2010) Fig. 27

Index Fungorum number: IF 514032; Facesoffungi number: FoF 06209

Saprobic on petiole of *Nymphaea odorata*. Sexual morph: *Ascomata* 125–232 high × 135–236 µm diam., superficial to partly immersed, scattered, globose, subglobose or hemispherical and flattened at the base, membranaceous, ostiolate, light brown, translucent when young, darkening with age. *Peridium* 5–10 µm wide, composed of hyaline to brown pseudoparenchymatic cells, with dark brown amorphous material deposited irregularly on the peridial surface, especially dense around the ostiole. *Pseudoparaphyses* not observed. *Asci* 38–59 µm × 38–63 µm ($\bar{x}$ = 54.5 × 63 µm, n = 10), bitunicate, fissitunicate, multiguttulate, thick-walled, globose to subglobose, short, pedicellate, containing eight irregularly arranged ascospores, without an ocular chamber, rounded at the apex. *Ascospores* 30–35 µm × 12–16 µm ($\bar{x}$ = 33 × 14.5 µm, n = 10), ellipsoidal, 1-septate, with thin septum, hyaline when immature, becoming dark brown when mature, upper cell longer and wider than lower cell, with apical papillae and appressed sheath outlining the ascospores. Asexual morph: Undetermined.

Material examined – USA, Florida, Everglades Water Management District, Water Conservation Area 2A, phosphorus unenriched site U3, 26º17’15.070”N, 80º 24’41.08”W, water temperature 19 ºC, pH 7, on submerged petiole of *Nymphaea odorata* (Nymphaeaceae), 17 November 2008, Huzefa A. Raja and Helen Violi. (ILL40789, micro slide of holotype).

Economic significance – *Alascospora evergladensis* is a saprobe and plays a role in breakdown and mineralization of organic matter in freshwater habitats (Jones et al. 2000).

Anguillosporella U. Braun, Monogr. Cercosporella, Ramularia Allied Genera (Phytopath. Hyphom.) 1: 233 (1995)

Parasitic on the surface of living leaves. Sexual morph: Undetermined. Asexual morph: *Thyriothecia* forming amphigenous, subcircular to irregular immarginate, flat, dark brown spots, sparsely scattered or not entirely distributed on surface of leaves. *Conidiophores* straight or slightly curved, brown, vermiform, curved, sigmoid or flexuose, pluriseptate, thick-walled, with terminal cell reduced to conidiogenous cells. *Conidiogenous cells* holoblastic, brown, smooth, obpyriform. *Conidia* solitary, conglobate, hyaline when immature, brown when mature, 1-septate, strongly constricted at the septum, thick-walled.

Type species – *Anguillosporella vermiformis* (Davis) U. Braun

Notes – The genus *Anguillosporella* was introduced by Davis (1995) with *Anguillosporella vermiformis* as the type species, found on *Alnus* (Betulaceae) in North America. Sexual morph of this genus is unknown. *Anguillosporella* is characterized by flat, dark brown spots or colonies, vermiform conidiophores, holoblastic conidiogenous cells and conglobate brown conidia. Redhead and White (1985) referred *A. vermiformis* as a phytopathogenic taxon. Wijayawardene et al. (2014) referred *Anguillosporella* to Dothideomycetes genera *incertae sedis*. Videira et al. (2017) examined

the lectotype of *A. vermiformis* and morphologically treated the genus in Mycosphaerellaceae but could not resolve the phylogenetic position of the taxa. Currently the genus comprises two species, *Anguillosporella coryli* (Redhead & G.P. White) U. Braun and *Anguillosporella vermiformis* (Davis) U. Braun. We re-examined the type specimen of *A. vermiformis* from S herbarium (F4817) in which the conidiophores are seen as macronematous, vermiform, septate and conidiogenous cells as holoblastic. Therefore, we suggest that this genus should be retained in Dothideomycetes genera *incertae sedis*. The fungus should be recollected and fresh materials must be re-examined.

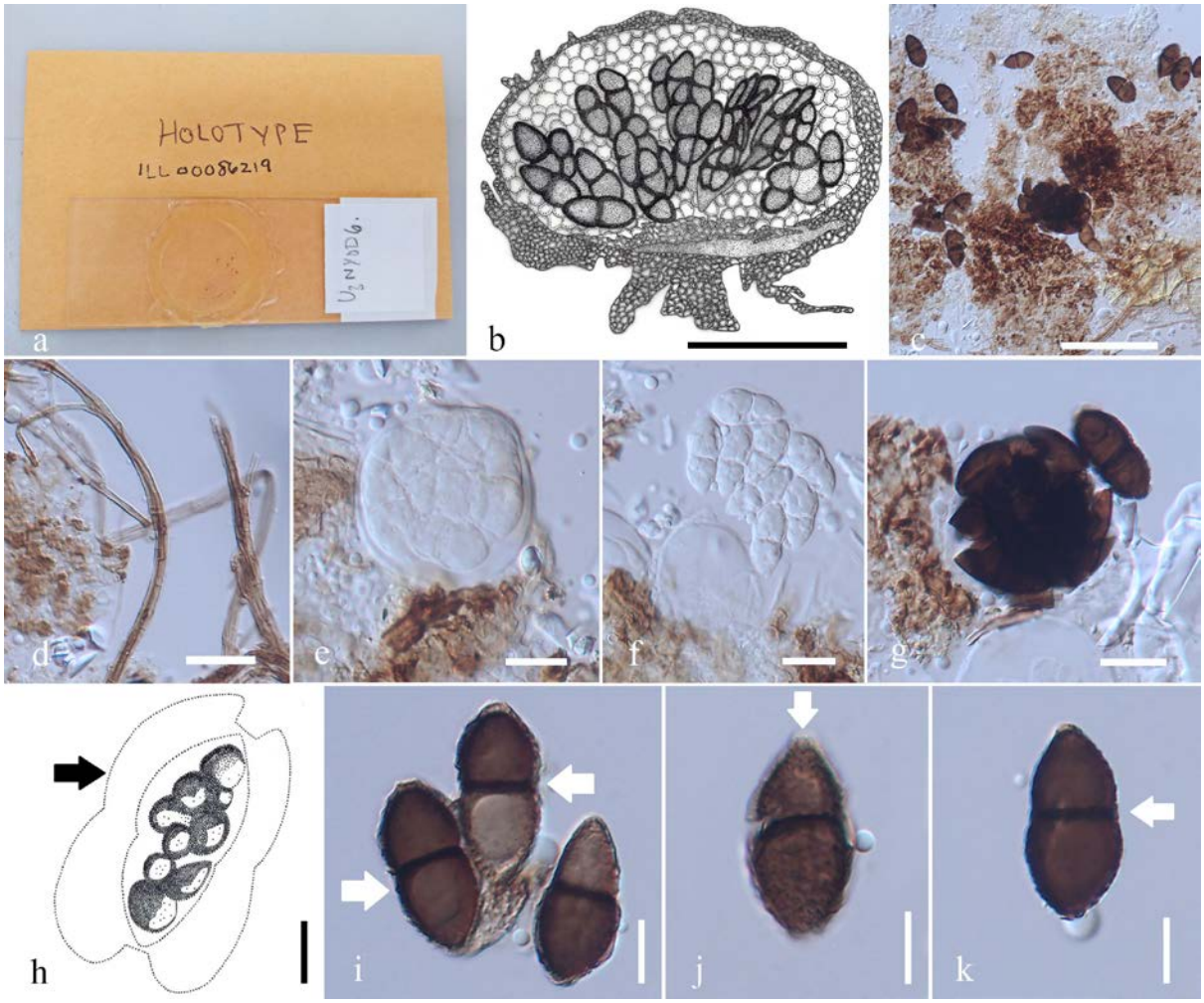

Figure 27 – *Alascospora evergladensis* (ILL40789, holotype). a Herbarium specimen. b Section of ascoma (redrawn from Raja et al. 2010). c Squash amount of ascomata. d Mycelium. e, f Young, globose, thick-walled ascus. g Globose to subglobose ascus with mature ascospores. h Young, multiguttulate, septate, ascospore with wing-shaped gelatinous sheath (arrows indicate wing-shape gelatinous sheath which swells in water when freshly collected). i Mature ascospores showing verruculose sheath (arrows indicate appressed sheath). j–k Spore surface showing appressed sheath that appears verruculose due to condensed sheath (j: arrow indicate apical papillae, k: arrow shows septum). Scale bars: b = 50 µm, c = 100 µm, d–g = 20 µm, i–k = 5 µm.

Anguillosporella vermiformis (Davis) U. Braun, Monogr. *Cercosporella*, *Ramularia* Allied Genera (Phytopath. Hyphom.) 1: 234 (1995) Fig. 28

= *Cylindrosporium vermiforme* Davis, Trans. Wis. Acad. Sci. Arts Lett. 18(1): 104 (1915)

Index Fungorum number: IF 121640; Facesoffungi number: FoF 06210

Parasitic on the surface of living leaves of *Alnus incana*. Sexual morph: Undetermined. Asexual morph: *Thyriothecia* 0.5– 2 mm high × 5– 15 mm diam. ($\bar{x}$ = 0.5 × 13 µm, n = 10), forming amphigenous, subcircular to irregular immarginate, flat dark brown spots, sparsely

scattered or not entirely distributed on surface of leaves. *Conidiophores* 18–26 µm high, 3–4 µm wide ($\bar{x}$ = 22 × 3 µm, n = 10), straight or slightly curved, brown, vermiform, curved, sigmoid or flexuose, pluriseptate, thick-walled. *Conidiogenous cells* holoblastic, brown. *Conidia* 6–10 µm × 4–6 µm ($\bar{x}$ = 6 × 5 µm, n = 10) solitary, conglobate, hyaline when immature, brown when mature, 1-septate, strongly constricted at the septum, thick-walled.

Material examined – USA, Wisconsin, Devils Lake, Sauk Co. on leaves of *Alnusincana* sp (Betulaceae), 7 August 1913, J.J. Davis (F4817, holotype).

Economic significance – The genus *Anguillosporella* is a plant pathogenic genus, causing large, confluent, brown leaf spots and disease on hosts especially on hazelnut (*Corylus avellana*) (Pscheidt 2012).

Asterinema Bat. & Gayão**,** Anais IV Congr. Soc. bot. Brasil: 160 (1953)

Biotrophic or *parasitic* on living leaves. *Colonies* forming roundish to irregular blackened blotches, sometimes in groups. Sexual morph: *Thyriothecia* circular with irregular margin, solitary or gregarious, semi-immersed to superficial, carbonaceous, and black. *Peridium* comprising several layers of compressed, brown-black, broad cells of *textura angularis*. *Hamathecium* sparse, hyaline, septate or aseptate, long pseudoparaphyses inclined towards the center. *Asci* 8-spored, bitunicate, fissitunicate, obclavate, with a short pedicel. *Ascospores* biseriate, hyaline, oblong to broadly ellipsoidal or subclavulate, guttulate, slightly constricted at the septum, wall minutely roughened upper cell wider and shorter than the lower cell. Asexual morph: Undetermined.

Type species – *Asterinema casearіae* Bat. & Gayão

Notes – *Asterinema* was introduced as a monotypic genus and accomodated in the family Asterinaceae (Batista & Gayao 1953, Wu et al. 2011). The genus is typified by *A. casearіae* which was found in Brazil. Later, three species and one variety were added by Batista et al. (1958). The genus is characterised by superficial hyphae with one-celled appressoria, thyriothecia with an irregular central ostiole and conglobate ascospores. The asci are in a horizontal position from the outer rim inclined towards central ostiole and are cylindro-clavate. The asexual morph of *Asterinema* is *Eriothyrium* (Kirk et al. 2008, Hyde et al. 2011). Müller and von Arx (1962) recognized this genus as comprising *A. casearіae* and *A. glabratae* Bat. & Maia. Farr (1983) revised the genus accepting only the type species *A. casearіae*, and a newly described variety *A. casearіae* var. *amazonense*, which was different from the type species in having eight ascospores in the ascus and oppositely arranged hyphopodia. Farr (1983) also placed this genus in Microthyriaceae. Later, *Asterinema* was excluded from Microthyriaceae because of the arrangement of cells in the thyriothecium (Wu et al. 2011). Cultures and sequences are unavailable hence the genus needs revision. *Asterinema* is placed in *Dothideomycetes* genera *incertae sedis* until recollected and analysed with molecular data.

Asterinema casearіae Bat. & Gayão, Anais IV Congr. Soc. bot. Brasil: 160 (1953) Fig. 29

Index Fungorum number: 293427; Facesoffungi number: FoF 06211

Biotrophic or *parasitic* on living leaves. *Colonies* 130–311 µm wide, 130–275 µm high ($\bar{x}$ = 220 × 210 µm, n = 10), forming roundish to irregular blackened blotches, sometimes in groups. Sexual morph: *Thyriothecia* 75–48 µm high × 105–320 µm diam., circular with irregular margin, solitary or gregarious, semi-immersed to superficial, carbonaceous, and black. *Peridium* 6–10 µm thick, comprising several layers of compressed, brown-black, 3–4 µm broad cells of *textura angularis*. *Hamathecium* sparse, hyaline, 1.5 µm broad, septate or nonseptate, long pseudoparaphyses inclined towards the center. *Asci* 50–100 µm × 10–16 µm ($\bar{x}$ = 80 × 12 µm, n = 15), 8-spored, bitunicate, fissitunicate, obclavate, with a short pedicel. *Ascospores* 16–20 µm × 6–7 µm ($\bar{x}$ = 17 × 6.8 µm, n = 10), biseriate, hyaline, oblong to broadly ellipsoid or subclavulate, guttulate, slightly constricted at the septum, wall minutely roughened upper cell wider and shorter than the lower cell. Asexual morph: Undetermined.

Material examined – BRAZIL, on leaves of *Casearia* sp. (Flacourtiaceae), 30 September 1955, K. P. Dumont (NY00914016, holotype).

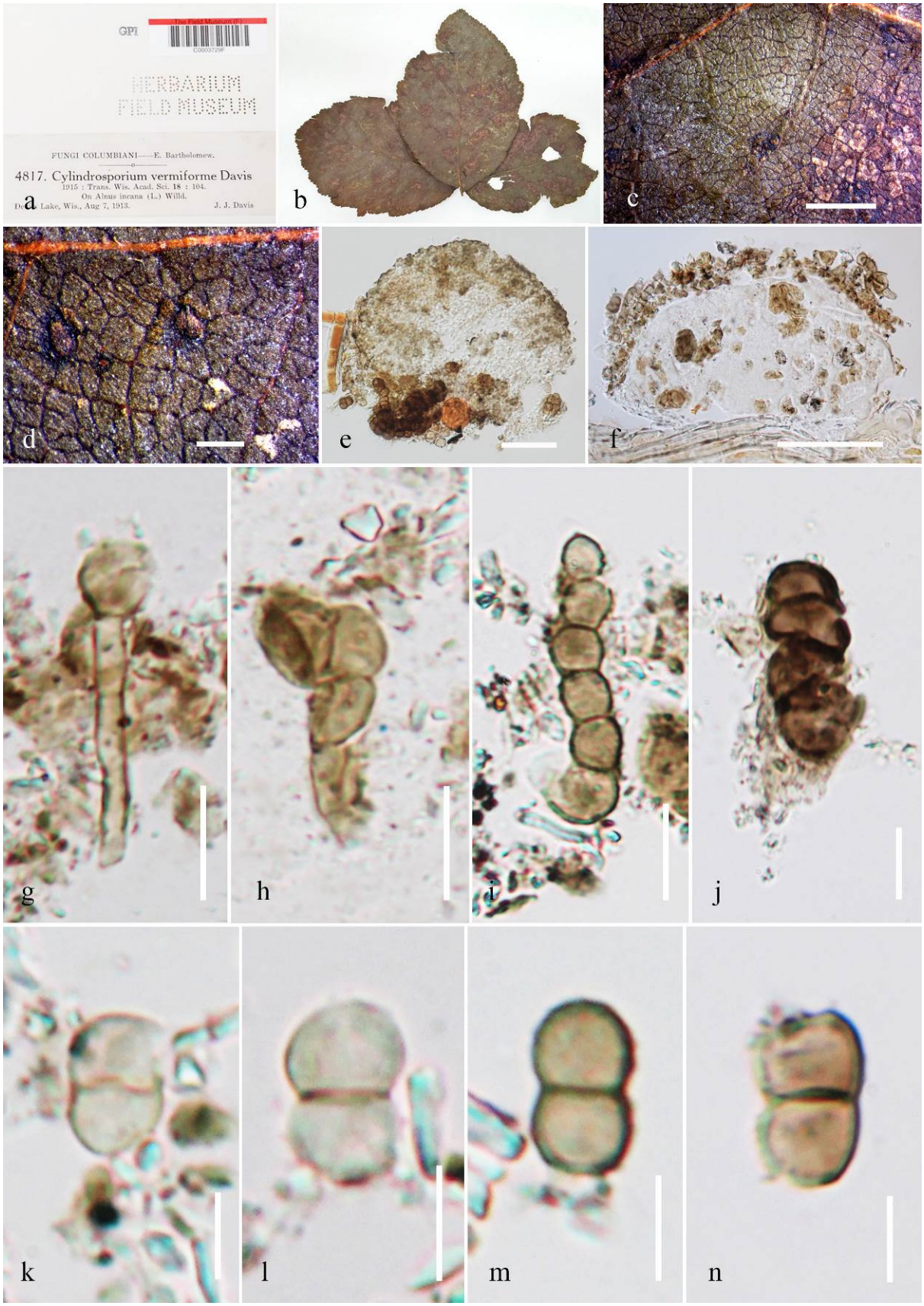

Figure 28 – *Anguillosporella vermiformis* (F4817, holotype). a–d Herbarium specimen and habit on leaf. e Squash mount of a conidioma. f Section of a conidioma g–j Conidiophore and conidiogenous cells. k–n Conidia. Scale bars: c = 1 mm, d = 500 µm, e, f = 50 µm, g–j = 10 µm, k–n = 5 µm.

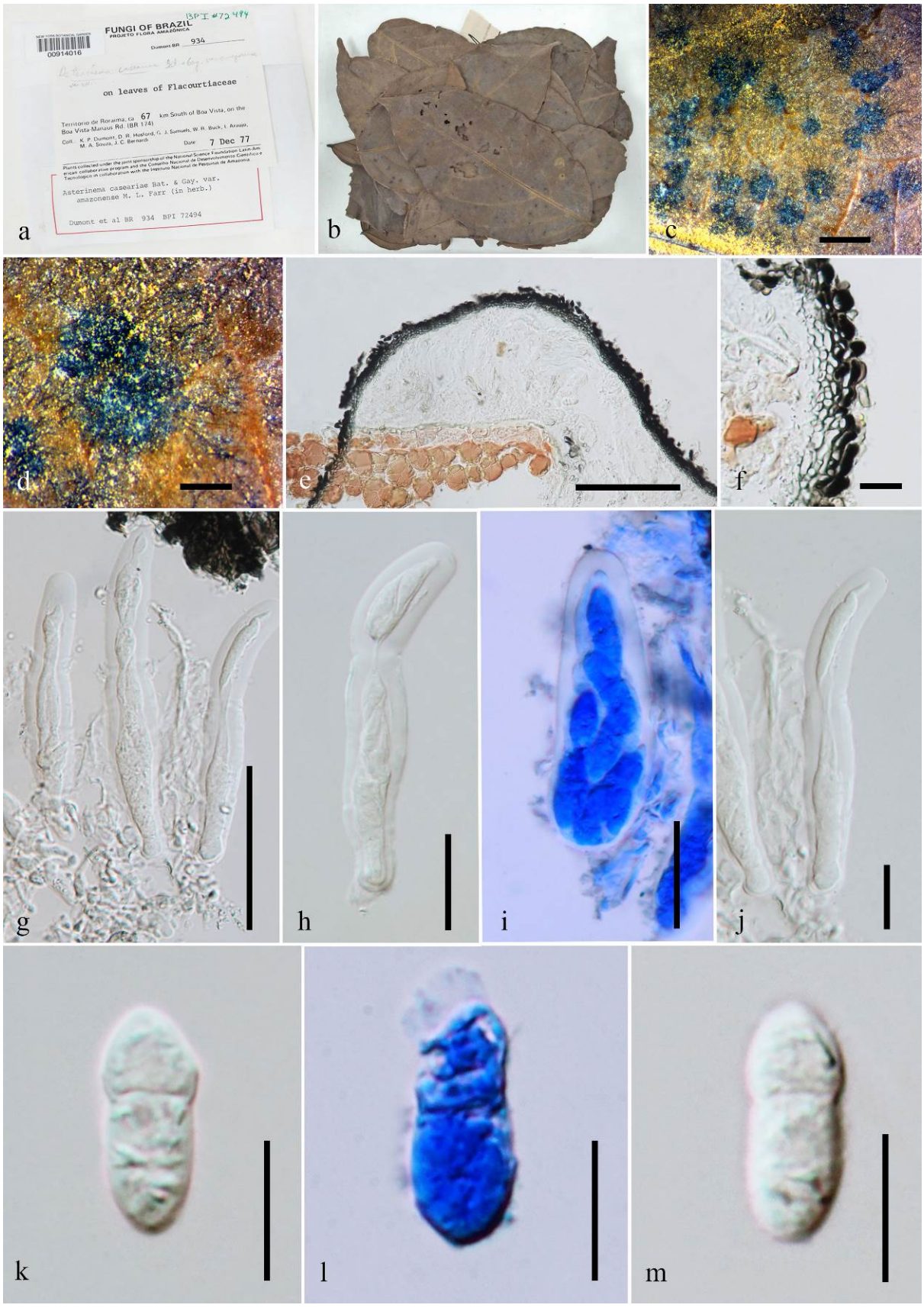

Figure 29 – *Asterinema caseariae* (NY00914016, holotype). a–b Herbarium specimen and habit on leaf. c, d Appearance of ascomata on leaf surface. e Section of ascoma. f Peridium. g Asci entangled in pseudoparaphyses. h–j Asci. k–m. Ascospores. Note: i, l stained in lactophenol cotton blue. Scale bars: c, d = 500 µm, e = 100 µm, f, k–m = 10 µm, g = 50 µm, h–j = 20 µm.

Economic significance – The genus *Asterinema* comprises foliicolous fungi or leaf inhabiting fungi that manisfests as black and brown mildew, powdery mildew, smuts and rusts on wide range of hosts (Ali Ganie 2010).

Asteromassaria Höhn., Sber. Akad. Wiss. Wien, Math.-naturw. Kl., Abt. 1 126(4-5): 368 (1917)

Saprobic on unidentified dry twigs in terrestrial habitat. Sexual morph: *Ascomata* solitary, scattered, or in small groups, immersed, erumpent, depressed globose or subglobose, medium to large, black, ostiolate. *Ostiole* papillate, opening via a minute slit or a small conical swelling in the bark. *Peridium* 1–layered, composed of small pigmented thick-walled compressed cells, with base consisting of small, pigmented, thick-walled cells of *textura angularis* and apex comprising comparatively large cells. *Hamathecium* of dense, cellular, filiform, broad, septate pseudoparaphyses, embedded in a gelatinous matrix. *Asci* 8-spored, bitunicate, fissitunicate, broadly cylindrical to broadly cylindro-clavate, with a short, narrow, thick pedicel, rounded at the apex with a small ocular chamber. *Ascospores* biseriate, partially overlapping, narrowly oblong with broadly to narrowly rounded ends, hyaline, 1-septate, constricted at septum, comprises smooth to verrucose spore wall without a mucilaginous sheath. Asexual morph: *Scolicosporium macrosporium* (Berk.) B.Sutton. *Acervuli* immersed in bark, brown, discrete, up to 200 µm diam., opening by irregular rupture of the overlaying tissues. *Conidiophores* cylindrical, 1–2 septate. *Conidiogenous cells* holoblastic, 1–2 annellate, cylindrical. *Conidia* fusoid, brown with paler or hyaline ends, 7–17 transversely septate, smooth-walled, with a tapered apex and truncate base.

Type species – *Asteromassaria macrospora* (Desm.) Höhn.

Notes – The genus *Asteromassaria* was introduced by Höhnel (1917) with *Asteromassaria macrospora* (= *Sphaeria macrospora* Desm.) as the type species which was found on dry twigs in France. Presently, the genus *Asteromassaria* comprises 12 species (Index Fungorum 2019). *Asteromassaria* was placed in Pleomassariaceae by Lumbsch and Huhndorf (2010). It was then transferred to Morosphaeriaceae by Zhang et al. (2012). Later, based on morphology, *Asteromassaria* was moved to Dothideomycetes genera *incertae sedis* (Hyde et al. 2013, Kirk et al. 2013, Wijayawardene et al. 2014, Wijayawardene et al. 2018). We re-examined the holotype specimen of *Asteromassaria macrospora* under the code S-F73254 and it is distinct from species in Pleomassariaceae as the latter are characterized by brown to golden brown, muriform ascospores, frequently with a mucilaginous sheath while the type species of *Asteromassaria* has hyaline 1-septate ascospores without mucilaginous sheath. Molecular data are available but lacking for the type species. Only Internal transcribed spacer (ITS) gene and 18S ribosomal RNA gene regions have been deposited for *Asteromassaria olivaceohirta* and ITS gene for *Asteromassaria berberidicola* in GenBank. Based on a megablast search using the ITS sequence of *Asteromassaria olivaceohirta*, the closest matches in NCBI's GenBank nucleotide database were *Ulospora bilgramii* strain CBS 110020, *Neotestudina rosatii* strain CBS 690.82, *Zopfia rhizophila* with identities 99%, 99% and 99% respectively. While those of *Asteromassaria berberidicola* reveals closest match to unidentified fungal endophyte (STRI: ICBG), Fungal sp. S12 ZLY-2010 and *Hendersonia pinicola* (EBJul30-4) with identities 89%, 89%, and 88% correspondingly. Based on our multigene-phylogenetic analyses (LSU, SSU, TEF, RPB2) using a strain of *Asteromassaria pulchra* (CBS 124082), the latter clusters as an independent lineage close to species of Morosphaeriaceae (data not shown). It is clear that the genus *Asteromassaria* is distinct from all species in the Dothideomycetes. However, more sequences are required to solve its correct taxonomic placement hence, we retain *Asteromassaria* in Dothideomycetes, genera *incertae sedis*.

Asteromassaria macrospora (Desm.) Höhn., Sber. Akad. Wiss. Wien, Math.-naturw. Kl., Abt. 1 126(4-5): 368 (1917) Fig. 30

≡ *Sphaeria macrospora* Desm., Annls Sci. Nat., Bot., sér. 3 11(2): 350 (1849)

Index Fungorum number: IF 120830; Facesoffungi number: FoF 06213

Saprobic on unidentified dry twigs in terrestrial habitat. Sexual morph: *Ascomata* 0.9–1.2 mm high × 0.9–1.3 mm diam. ($\bar{x}$ = 1.5 × 1.1 µm, n = 10), solitary, scattered, or in small groups,

immersed, erumpent, depressed globose or subglobose, medium to large, black, ostiolate. *Ostiole* papillate, opening via a minute slit or a small conical swelling in the bark. *Peridium* 53–65 µm, 1-layered, composed of small pigmented thick-walled compressed cells, base consists of small, pigmented, thick-walled cells of *textura angularis* and apex comprises comparatively large cells. *Hamathecium* 3.5–4 µm of dense, cellular, filiform, broad, septate pseudoparaphyses, embedded in a gelatinous matrix. *Asci* 200–245 µm × 36–40 µm ($\bar{x}$ = 230 × 38 µm, n = 10), 8-spored, bitunicate, fissitunicate, broadly cylindrical to broadly cylindro-clavate, with a short, narrow, thick pedicel, rounded at the apex with a small ocular chamber. *Ascospores* 50–56 µm × 16–22 µm ($\bar{x}$ = 54 × 19 µm, n = 10), biseriate, partially overlapping, narrowly oblong with broadly to narrowly rounded ends, hyaline, 1-septate, constricted at septum, smooth to verrucose, without a mucilaginous sheath. Asexual morph: *Scolicosporium macrosporium* (Berk.) B. Sutton. *Acervuli* immersed in bark, brown, discrete, up to 200 µm diam., opening by irregular rupture of the overlaying tissues. *Conidiophores* cylindrical, 1–2 septate, up to 30 µm long and 3–5 µm wide. *Conidiogenous cells* holoblastic, enteroblastic, 1-2-annellate, cylindrical. *Conidia* 140–190 µm × 12–18 µm, fusoid, brown, with paler or hyaline ends, 7–10 transverse septate, smooth-walled, with a tapered apex and truncate base.

Material examined – FRANCE, Normandie, in the park of Lébisey near Caen, on unidentified dry twigs, 6 April 1845, Roberge (S-F73254, holotype).

Economic significance – The genus *Asteromassaria* seems to be a source of an enzyme capable of breaking the middle lamella of bark cells and a biological agent of interest able to digest wood (Shoemaker et al. 2003). *Asteromassaria* has also been reported to be associated to Mulberry diseases of Japan (Tanaka 2005).

Asteromella Pass. & Thüm., in Thümen, Mycoth. Univ., cent.17: no. 1689 (1880)

Epifoliar on the upper surface of living leaves. *Colonies* forming blackened 0.2–0.4 mm circular areas. Sexual morph: Undetermined. Asexual morph: *Pycnidia* hypophyllous, dark brown to black, globose to subglobose, superficial with irregular margins, sometimes sparsely scattered or not entirely distributed on surface of leaves. *Peridium* thick walled comprised of cells of *textura globulosa*. *Conidiophores* reduced to conidiogenous cells. *Conidiogenous cells* enteroblastic, phialidic, integrated or less often discrete, determinate, hyaline (Sutton 1980, van der Aa & Vanev 2002). *Conidia* simple, cylindrical to ovoid, hyaline, 1–septate, ellipsoidal to cylindrical, eguttulate.

Type species – *Asteromella ovata* Thüm.

Notes – *Asteromella*, introduced by Passerini & Thümen (1880), is a large genus of plant-inhabiting coelomycetous fungi presently referred to Dothideomycetes *incertae sedis* (Hyde et al. 2011, Wijayawardene et al. 2018). The type species, *Asteromella ovata*, is a coelomycetous fungus producing minute, bacteria-like spores and was found on leaves of *Menispermum canadense* in Italy. The characteristics of the type species provided by Thümen (1880) are conidiomata, conidia and dark lesions of host plant leaves caused by the fungus. The genus *Asteromella* has been critically monographed by Ruszkiewicz-Michalska (2016). Currently, there are around 265 species listed (Index Fungorum 2019). The sexual morph is unknown. We did microscopic observation of the holotype specimen of *Asteromella ovata* from S herbarium and compared morphological characters with the original protologue. Due to its '*Phoma*' like conidia and limited morphological characters, we retain the genus to Dothideomycetes genera *incertae sedis*.

Asteromella ovata Thüm., Mycoth. Univ., cent.17: no. 1689 (1880) Fig. 31

Index Fungorum number: IF 197904; Facesoffungi number: FoF 06214

Epifoliar or *epiphytes* on the upper surface of living leaves leaves of *Menispermum canadense* L. (Menispermaceae). *Colonies* forming blackened 0.2–0.4 mm circular areas. Sexual morph: Undetermined. Asexual morph: *Pycnidia* 250–430 µm high × 196–210 µm diam., ($\bar{x}$ = 343 × 203 µm, n = 10), hypophyllous, dark brown to black, globose to subglobose, superficial with irregular margins, sometimes sparsely scattered or not entirely distributed on surface of leaves.

Peridium 13–18 µm, thick walled comprised of cells of *textura globulosa*. *Conidiophores* reduced to conidiogenous cells.

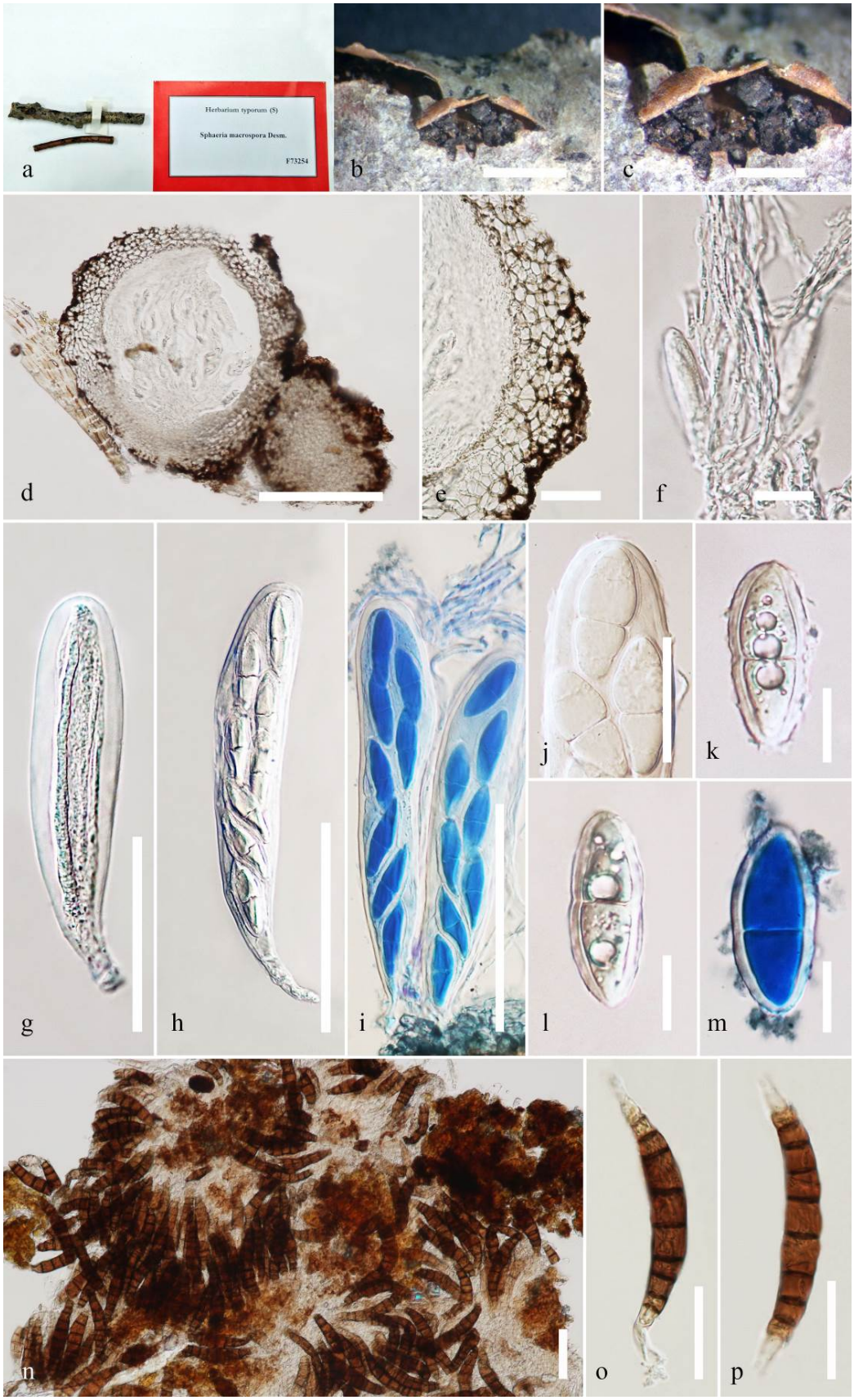

Figure 30 – *Asteromassaria macrospora* (S-F73254, holotype). a Details of herbarium material. b, c Habit and appearance of ascomata on host surface. d Section of ascomata. e Peridium. f

Hamathecium. g–j Asci. k–m Ascospores. n Squash mount of acervuli. o, p Conidia. Scale bars: b = 2 mm, c, d = 1 mm, e = 40 µm, f = 10 µm, g = 30 µm, h–j, o, p = 50 µm, k–m = 20 µm, n = 100 µm.

Conidiogenous cells enteroblastic, phialidic, integrated or less often discrete, determinate, hyaline (Sutton 1980, van der Aa & Vanev 2002). *Conidia* 6.7–8 µm × 3–5 µm ($\overline{x}$ = 8 × 5 µm, n = 10) cylindrical to ovoid, hyaline, 1-septate, ellipsoid to cylindrical apparently with 2-guttules, eguttulate.

Material examined – PARMA, Parma Botanical Garden, on leaves of *Menispermum canadense* L. (Menispermaceae), November 1878, Passerini (S-F40912, holotype).

Economic significance – The anamorphic genus *Asteromella* is a pathogenic genus causing dark lesions, stains, leaf spots and discoloration of host plant leaves in Poland (Ruszkiewicz-Michalska 2016). *Asteromella* is also associated with leaf blotch symptom of lime trees (Butin & Kehr 1995). The genus was also reported on withering leaves of *Prunus armeniaca* 'Aprikose von Nancy' (Bedlan 2014) as well as ring spots on Brussels sprout and cabbage in UK (Koike et al. 2007). The genus *Asteromella* is also a pistachio pathogen (Vitale et al. 2018).

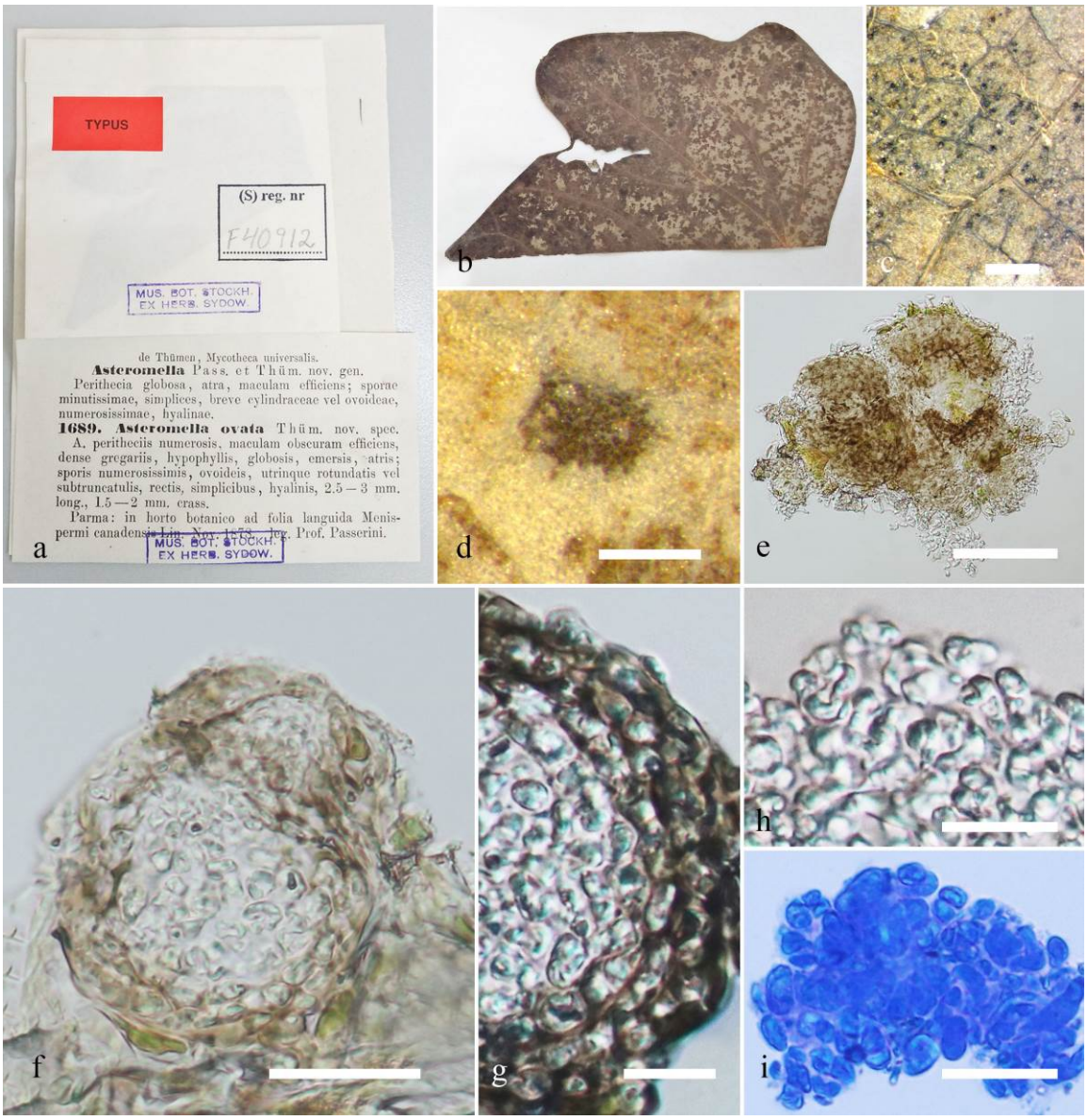

Figure 31 – *Asteromella ovata* (S-F40912, holotype). a Details of herbarium material. b–d Herbarium specimen and habit on leaf. e Squash mounts of pycnidium. f Section of pycnidium. g

Peridium. h Conidia. i Conidia stained in lactophenol cotton blue. Scale bars: c, d = 2 mm, e, f = 200 µm, g = 30 µm, h, i = 10 µm.

Bactrodesmium Cooke, Grevillea 12(no. 61): 35 (1883)

Pathogenic on dead wood. Sexual morph: Undetermined. Asexual morph: *Sporodochia* scattered, punctiform, dark-brown. *Conidiophores* macronematous, mononematous packed together closely to form pulvinate sporodochia, unbranched, mid to dark-brown, smooth, septate. *Conidiogenous cells* integrated, holoblastic, monoblastic, terminal, cylindrical. *Conidia* oblong-clavate, confluent with the stem, 4 to 6- septate, the lower articulation and the uppermost short, the second from the top very long, solitary, straight to curved, rounded at the tip and truncate at the base, the upper end becoming progressively paler towards the basal cell which is usually sub-hyaline, with a very dark band at the first septum from the top, smooth.

Type species – *Bactrodesmium abruptum* (Berk. & Broome) E.W. Mason & S. Hughes

Notes – The genus *Bactrodesmium* is established by Cooke (1883) to accommodate *Sporidesmium abruptum* Berk. and Br., *Sporidesmium spilomeum* Berk. and Br. *Sporidesmium abruptum* was transferred to *Bactrodesmium* but the binomial was invalidly published. The combination was later validated by Mason & Hughes (1958), and *B. abruptum* was designated as the lectotype species of *Bactrodesmium*. Two new species namely, *B. opacum* and *B. clavulatum* were later added to the genus *Bactrodesmium* by Cooke & Harkness (1884). Currently, more than 48 epithets are accommodated in the genus *Bactrodesmium* (Index Fungorum 2019). The sexual morph is reported to be *Stuartella* spp. (Wijayawardene et al. 2018). The genus is heterogeneous and includes species with pseudoseptate conidia, such as *B. rahnii* M.B. Ellis (Ellis 1976) or euseptate, with or without presence of black bands in the septa. They are rarely verrucose as in *Bactrodesmium palmicola* Mercado, Heredia & J. Mena (Mercado-Sierra et al. 1995) or with longitudinal septa such as *Bactrodesmium indicum* Reghuveer (Rao 1983). The genus *Bactrodesmium* is identified by its sporodochial conidiomata and hyaline or brown, simple or branched conidiophores associated with mono- or polyblastic conidiogenous cells (Ellis 1971, Holubova-Jechova 1972). According to a study conducted by Hernandez-Restrepo (2013) based on *B. obovatum* (FR870265), *B. pyriforme* (FR870266) and *B. pyriforme* (HE646637), the genus *Bactrodesmium* clusters in Sordariomycetes, genera *incertae sedis*. In the analyses conducted by (Hernandez-Restrepo 2017), *Bactrodesmium pallidum* (FMR 11345) formed a clade in the Savoryellaceae, *Bactrodesmium gabretae* (ZK) was basal to *Calycina citrigena* (ILLS 61033) while *Bactrodesmium cubense* (CBS 680.96) was basal to *Morosphaeria velatispora* (KH 218). In our phylogenetic analyses using LSU and ITS sequences available in GenBank, the strain *Bactrodesmium gabretae* (ZK) is basal to *Dermea acerina* (CBS 161.38) which is accommodated in Leotiomycetes; *Bactrodesmium pallidum* (FMR 11345) is basal to *Bahusakala longispora* (CBS 544.84) in Sordariomycetes while *Bactrodesmium cubense* (CBS 680.96) is basal to *Morosphaeria ramunculicola* (BCC 18404) in Morosphaeriaceae (data not shown). The genus *Bactrodesmium* is polyphyletic and taxonomy is still unresolved because of its potential high diversity and lack of DNA sequences. More cultures and DNA sequences are required to build the phylogenetic tree of *Bactrodesmium* and resolve its correct taxonomic position. We illustrate the characters of the genus *Bactrodesmium* by re-examining the type specimen *Sporidesmium abruptum* Berk. Br. under the code IMI 6833. The genus needs epitypifying or a reference specimen. Based on morphological characters, we retain the genus *Bactrodesmium* sensu stricto in Dothideomycetes, genera *incertae sedis*.

Bactrodesmium abruptum (Berk. & Broome) E.W. Mason & S. Hughes, in Hughes, Can. J. Bot. 36: 738 (1958) Fig. 32

≡ *Sporidesmium abruptum* Berk. & Broome, Ann. Mag. nat. Hist., Ser. 3 15: 401 (1865)

Index Fungorum number: IF 162285; Facesoffungi number: FoF 06216

Pathogenic on dead wood. Sexual morph: Undetermined. Asexual morph: *Sporodochia* 216–276 µm diam., scattered, punctiform, dark-brown. *Conidiophores* 13–20 µm × 4–6 µm ($\bar{x}$ = 17 × 5

µm, n = 20), macronematous, mononematous, packed together closely to form pulvinate sporodochia, unbranched, mid to dark-brown, smooth, septate. *Conidiogenous cells* integrated, holoblastic, monoblastic, terminal, cylindrical. *Conidia* 42–66 µm × 11–19 µm ($\overline{x}$ = 51 × 16 µm, n = 20), oblong-clavate, confluent with the stem, 4–6-septate, the lower articulation and the uppermost short, the second from the top very long, solitary, straight to curved, rounded at the tip and truncate at the base, the upper end becoming progressively paler towards the basal cell which is usually sub-hyaline, with a very dark band at the first septum from the top, smooth.

Material examined – UK, on dead wood, March 1964, Bloxam, (IMI 6833, holotype).

Economic significance – The genus *Bactrodesmium* is associated with degradation of rubber wood logs and leaf litter (Seephueak 2012). The genus can also infect living hosts such as white spruce (*Picea*), *Betula* species and others reducing the economic value of plants (Bagdžiūnaitė 2006). The genus *Bactrodesmium* has also been isolated from apple green leaves or dead leaves as pathogens (Bernier 1996).

Figure 32 – *Bactrodesmium abruptum* (IMI 6833, holotype). a, b Herbarium material. e Squash mount of a conidioma showing sporodochia. d–m Conidiophores and conidia. Scale bars: c = 50 µm, d–m = 20 µm.

Botryostroma Höhn., Sber. Akad. Wiss. Wien, Math.-naturw. Kl., Abt. 1 120: 424 (1911)

Saprobic on leaves of unidentified host. **Sexual morph**: Undetermined. **Asexual morph**: *Conidiomata* pycnidial, small, very dense or compact, rounded, circular or irregular, black, verrucose, growing from a subcuticular hypostroma, forming a thin single-celled, pseudoparenchymatous, translucent olive-brown crust, depressed in the dried state, papillate. *Conidiomata wall* outer layer thick, 7–8 layered, composed of thick-walled dark brown to black cells of textura globulosa, innermost wall thin, 2–3 layered of textura angularis, becoming hyaline. *Conidiophores* reduced to conidiogenous cells. *Conidiogenous cells* cylindrical or slightly irregular, short, sparsely branched, mostly at the base, hyaline or very pale brown, septate, smooth. *Conidia* straight, curved or irregular, truncate at the base, obtuse at apex, hyaline or pale brown, multi-septate, usually thin and smooth-walled or verruculose.

Type species – *Botryostroma inaequale* (G. Winter) Höhn.

Notes – The genus *Botryostroma* was introduced by Höhnel (1911). The genus is characterised by black ascomata produced under a clypeus, with numerous persistent pseudoparaphyses among asci. The genus was accommodated in Venturiaceae by Muller & von Arx (1962) based on its obclavate or fusiform asci, lightly pigmented, apiosporous ascospores. The asexual morph is coelomycetous. Due to its uncertain taxonomic placement, *Botryostroma* was accepted as a genus in Dothideomycetes, genera *incertae sedis* (Kirk et al. 2013, Wijayawardene et al. 2017). Currently, two species are accommodated in the genus. Cultures and sequences are unavailable. We re-studied the holotype specimen of *Botryostroma inaequale* under the basionym *Lizonia inaequalis* G. Winter with the code F10863 from S herbarium. We did not observe any sexual characters in the specimen. Based on the asexual morphological characters, we are uncertain regarding the taxonomic placement of the genus, hence we retain *Botryostroma* in Dothideomycetes, genera *incertae sedis*.

Botryostroma inaequale (G. Winter) Höhn. [as 'inaequalis'], Sber. Akad. Wiss. Wien, Math.-naturw. Kl., Abt. 1 120: 425 (1911) Fig. 33

≡ *Lizonia inaequalis* G. Winter, Hedwigia 24(6): 261 (1883)

Index Fungorum number: IF636; Facesoffungi number: FoF 06222

Saprobic on leaves of unidentified host. Sexual morph: Undetermined. Asexual morph: *Conidiomata* 194–259 μm diam., 187–206 μm high, pycnidial, small, very dense or compact, rounded circular or irregular, black, verrucose, growing from a subcuticular hypostroma, forming a thin celled layer, pseudoparenchymatous, translucent olive-brown crust, depressed in the dried state, papillate. *Conidiomatal wall* outer layer thick, 7–8 layered, composed of thick-walled dark brown to black cells of *textura globulosa*, innermost wall thin, 2–3 layered of *textura angularis*, becoming hyaline. *Conidiophores* reduced to conidiogenous cells. *Conidiogenous cells* 3.5–5.9 μm × 2.3–3.5 μm, holoblastic, cylindrical or slightly irregular, short, sparsely branched, mostly at the base, hyaline or very pale brown, septate, smooth. *Conidia* 20–26 μm × 3.0–4.3 μm ($\overline{x}$ = 21.8 × 3.4 μm, n = 20), straight, curved or irregular, truncate at the base, obtuse at the apex hyaline or pale brown, 3-transversely septate, usually thin and smooth-walled or verruculose.

Material examined – BRAZIL, close to San Franscisco, leaves of unidentified host, August 1884, E.Ule (S-F10863, holotype).

Economic significance – None is reported.

Bryorella Döbbeler, Mitt. bot. StSamml., Münch. 14: 128 (1978)

Saprobic or *parasitic* on leaves or the stem of wood moss (*Hylocomiaceae*) in terrestrial habitat. Sexual morph: *Ascomata* erumpent to completely superficial, solitary, spherical, globrous, dark brown to black, short papillate. *Peridium* wall composed of 2 layers, an outer layer comprising small, heavily pigmented, thick-walled cells of *textura angularis* and an inner layer comprising lightly pigmented to hyaline, thin-walled cells of *textura angularis*. *Hamathecium* of dense, filamentous, branching, anastomosing, non-septate, hyaline pseudoparaphyses. *Asci* 8-spored, cylindrical, with a short pedicel or sessile, rounded at the apex, with an ocular chamber, sometimes

bulbous expanded below. *Ascospores* uniseriate, elongated, ellipsoidal or rarely spindle, constricted at septa, 3–7-transversely septate, obtuse apex, sometimes narrow below, hyaline when immature to dark brown when mature, thick-walled, smooth. Asexual morph: Undetermined.

Type species – *Bryorella acrogena* Döbbeler

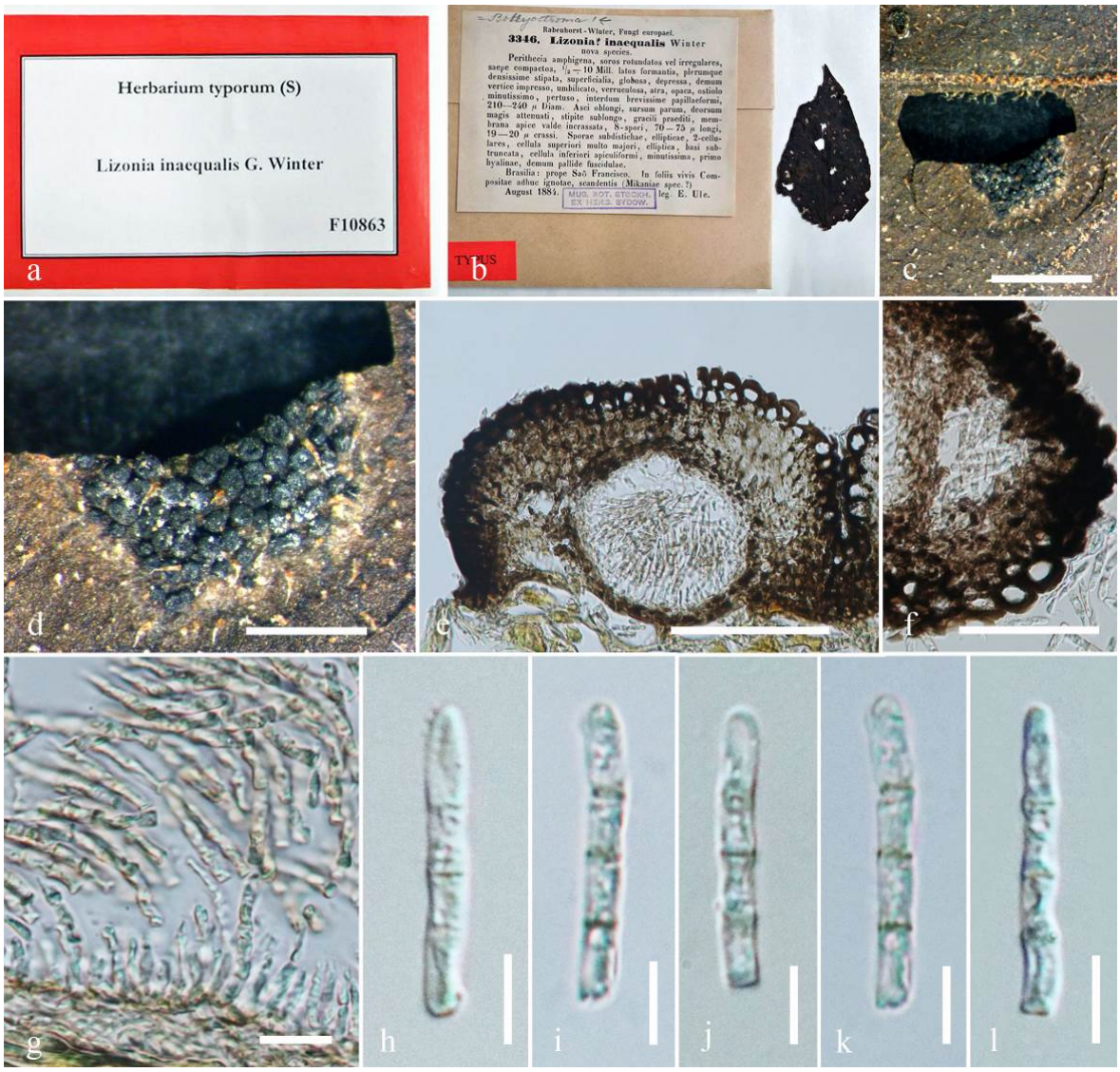

Figure 33 – *Lizonia inaequalis* (S-F10863, holotype). a Details of herbarium material. b–d Habit and appearance of conidiomata on host surface. e Section of conidioma. f Peridium. g Conidiogenesis. h–l Conidia. Scale bars: c = 2 mm, d = 1 mm, e = 100 µm, f = 50 µm, g = 10 µm.

Notes – *Bryorella* was introduced by Döbbeler (1978) with nine species namely, *B. acrogena*, *B. compressa* Döbbeler, *B. crassitecta* Döbbeler, *B. cryptocarpa* Döbbeler, *B. erumpens* Döbbeler, *B. gregaria* Döbbeler, *B. punctiformis* Döbbeler & Poelt, *B. retiformis* Döbbeler & Poelt and *B. semi-immersa* Döbbeler, with *B. acrogena* as the type species. *Bryorella acrogena* was found on *Hylocomium splendus* in Austria. Since then, two more species were added (Döbbeler 1981, 1982, 2007). Li et al. (2014) re-examined the type species of *Bryorella* and described the genus as characterized by superficial, disseminated, glabrous, small, ascomata with a cellular peridium, hyaline ascospores and a hymenium lacking a reaction in iodine (Li et al. 2014). However, the author did not observe any asci and ascospores and placed the genus in Dothideomycetes, *genera incertae sedis*. We re-examined another specimen from UME and found different morphological characters such as elongated ellipsoidal brown ascospores instead of hyaline ascospores as described by Li et al. (2014).

The taxon has narrow, anastomosing pseudoparaphyses that are typical of Melannomataceae (Tian et al. 2014), and it might be placed in this family. Liew et al. (2000) however, showed that such structures were only significant at the genus or species level. We therefore retain the genus in Dothideomycetes genera *incertae sedis*, until fresh specimens are collected and re-examined.

Bryorella acrogena Döbbeler, Mitt. bot. StSamml., Münch. 14: 131 (1978) Fig. 34

Index Fungorum number: IF 669; Facesoffungi number: FoF 06223

Saprobic or *parasitic* on leaves or the stem of wood moss (Hylocomiaceae) in terrestrial habitat. Sexual morph: *Ascomata* 111–225 µm high × 150–225 µm diam. ($\overline{x}$ = 115.6 × 162 µm, n = 10), erumpent to completely superficial, solitary, spherical, globrous, dark brown to black, short papillate. *Peridium* wall 39–45 µm composed of 2 layers, an outer layer comprising small, heavily pigmented, thick-walled cells of *textura angularis* and an inner layer comprising lightly pigmented to hyaline, thin-walled cells of *textura angularis*. *Hamathecium* of dense, filamentous, branching, anastomosing, aseptate, hyaline pseudoparaphyses. *Asci* 115–130 µm × 13–17 µm ($\overline{x}$ = 124.4 × 15.1 µm, n = 10), 8-spored, cylindrical, with a short pedicel or sessile, rounded at the apex, with an ocular chamber, sometimes bulbous expanded below. *Ascospores* 35–45 µm × 8–10 µm ($\overline{x}$ = 38.4 × 10.3 µm, n = 10), uniseriate, elongated ellipsoidal or rarely spindle, constricted at septa, 3–7 transversely septate, obtuse apex, sometimes narrow below, hyaline when immature to dark brown when mature, thick-walled, smooth. Asexual morph: Undetermined.

Material examined – AUSTRIA, Europe, Tirol on stem of wood moss *Hylocomium splendens* (Hedw.) W.P. Schimp. (Hylocomiaceae), 24 September 1973, P. Döbbeler (UME 30243).

Economic significance – The genus *Bryorella* contribute to the decomposition processes of mosses and hepatics. *Bryorella acrogena* has been reported to destroy the growing apices of single shoots in pleurocarpous mosses (Döbbeler 1978).

Cerodothis Muthappa, Mycologia 61: 737 (1969)

Saprobic on leaves. Sexual morph: *Thyriothecia* multilocular, pale yellow to brown, epiphyllous, sub-epidermal, comprises dark brown to brown cells of *textura angularis* (= cylindrical to cuboid cells). *Locules* globose to sub globose, ostiolate, with ectostroma bifurcate, endostroma rounded. *Asci* 8-spored, bitunicate, subcylindrical to clavate, sessile to very short-pedicellate, narrowly rounded at apex. *Ascospores* crowded, 2–3-seriate, 1-septate, narrowly obovoid to fusiform, hyaline, smooth-walled. Asexual morph: Undetermined.

Type species – *Cerodothis aurea* Muthappa

Notes – The monotypic genus *Cerodothis* was introduced by Muthappa in (1969) with *Cerodothis aurea* as the type species. The latter was isolated from leaves of *Bambusa arundinacea* in India. The asexual morph is unknown. We re-examined the holotype specimen of *Cerodothis aurea* from BPI under the code BPI 610067. The specimen is in poor condition and we could not observe many characters. The genus *Cerodothis* shares similar morphological characters to species of Microthyriaceae in having superficial, flattened, ascomata, with the cells of the upper wall radiating in parallel arrangement from the distinct central ostiolar opening, obclavate to cylindro-clavate asci and 2-celled ascospores (Wu et al. 2011). However, we could not observe the asci and ascospores from the specimen. We therefore, treat this genus as doubtful and retain it in Dothideomycetes, genera *incertae sedis*. This fungus needs to be recollected and restudied.

Cerodothis aurea Muthappa, Mycologia 61: 737 (1969) Fig. 35

Index Fungorum number: IF327982; Facesoffungi number: FoF 06673

Saprobic on leaves of *Bambusa arundinacea*. Sexual morph: *Thyriothecia* 500 × 250 µm, multilocular, pale yellow to brown, epiphyllous, sub-epidermal, comprises dark brown to brown cells of *texura angularis* (= cylindrical to cuboid cells). *Locules* globose to subglobose, ostiolate, in transverse section, ectostroma bifurcate 40–76 µm diam., endostroma rounded, 102–178 µm × 160–230 µm; locules 34–76 µm × 51–85 µm; ostiole 34–51 µm long. *Asci* 35–60 µm × 8–10 µm, 8-spored, bitunicate, subcylindrical to clavate, sessile to very short-pedicellate, narrowly rounded at

the apex. *Ascospores* 12–15 µm × 3–4 µm, crowded, 2–3-seriate, 1-septate, narrowly obovoid to fusiform, hyaline, smooth-walled. Asexual morph: Undetermined.

Material examined – INDIA, Green Lands, Coorg, on leaves of *Bambusa arundinacea* (Poaceae), 10 March 1968, B.N. Muthappa (BPI 610067, holotype).

Economic significance – Members of the genus *Cerodothis* cause leaf spot by producing yellow microconidia on *Bambusa bambos* stands in Karnataka State (Muthappa 1969) and on *Dendrocalamus strictus* and *Thyrsostachys siamensis* stands in Kerala State (Mohanan 1994a, b).

Chaetosticta Petr. & Syd., Annls mycol. 23(3/6): 270 (1925)

= *Pyrenochaeta* subgen. *Trichocicinnus* Sacc., Annls mycol. 3(6): 512 (1906) [1905]

= *Trichocicinnus* (Sacc.) Höhn., in Weese, Ber. dt.bot. Ges. 37: 159 (1919)

Endophytic or *pathogenic* on lower surface of living leaves of dicotyledon plants. Sexual morph: Undetermined. Asexual morph: *Pycnidia* superficial, loosely scattered, roundish to subglobose, papillate, black, sparingly clothed with straight, translucent olive brown continuous, bristle-like hairs of equal in length to the diameter of the conidiomata, more thickly set around the orifice, paler and more or less substellate-tufted below, easily removed from the host surface. *Conidiophores* branched, septate, compact, hyaline, cylindrical, tapered towards the apex, smooth-walled. *Conidiogenous cells* enteroblastic, phialidic, with minute collarette, discrete or integrated, cylindrical, tapered towards the apex. *Conidia* numerous, very dense, small, very variable from short oblong to oblong-elliptical, aseptate, hyaline, constricted at septa, truncate to pointed at base, light brown to olivaceous brown, thick and smooth-walled, with one to many oil droplets.

Type species – *Chaetosticta perforata* (Ellis & Everh.) Petr. & Syd.

Notes – The genus *Chaetosticta* was introduced by Petrak & Sydow (1925) for the type species *Chaetosticta perforata* which was named as *Chaetomella perforata* isolated from living leaves of *Cirsium discolor*. Later, *Chaetomella perforata* was found to be an ascomycete by Ellis & Everhart who renamed it as *Venturia occidentalis* (Sutton 1980). In another work, Saccardo transferred *Venturia occidentalis* to *Acanthostigma occidentale* (Ellis & Ev.) Sacc (Lefebvre & Stevenson 1945). In 1971, the genus *Chaetosticta* was redescribed by Crane (1971) and a lectotype was chosen. It was then transferred to Dothideomycetes, genera *incertae sedis* due to its uncertain morphological characters (Kirk et al. 2013, Wijayawardene et al. 2018). The sexual morph is unknown. Cultures and sequence data are unavailable. We re-examined the isotype specimen of *Chaetosticta perforata* from S herbarium under the code F49139. Morphological characters of *Chaetosticta perforata* are similar to *Pyrenochaeta erysiphoides* Sacc. In this study, we synonymise *Chaetosticta perforata* (≡*Chaetomella perforata* Ellis & Everh 1885) and *Pyrenochaeta erysiphoides* as all the three species share similar morphological characters and all of them were collected from the same hosts (*Cirsium* sp.). We believe that all these three fungi are the same but retain the genus *Chaetosticta* in Dothideomycetes, genera *incertae sedis*.

Chaetosticta perforata (Ellis &Everh.) Petr. & Syd., Annls mycol. 23(3/6): 270 (1925)

≡ *Chaetomella perforata* Ellis & Everh., J. Mycol. 1(12): 153 (1885)

= *Pyrenochaeta erysiphoides* Sacc., Annls mycol. 3(6): 512 (1906) [1905]

Index Fungorum number: IF163090; Facesoffungi number: FoF 06227 Fig. 36

Endophytic or *pathogenic* on lower surface of living leaves of *Cirsium arvense* (Asteraceae). Sexual morph: Undetermined. Asexual morph: *Pycnidia* 135–173 µm high × 104–143 µm diam ($\bar{x}$ = 150.6 × 121.8 µm, n = 10), superficial, loosely scattered, roundish to subglobose, papillate, black, sparingly clothed with straight, translucent olive brown continuous, bristle-like hairs about equal in length to the diameter of the perithecia, more thickly set around the orifice, paler and more or less substellate-tufted below, easily removed from the host surface. *Conidiophores* branched, septate, compact, hyaline, cylindrical, tapered towards the apex, smooth. *Conidiogenous cells* 3–4 µm, 1.2–1.3 µm ($\bar{x}$ = 3.8 × 1.3 µm, n = 10), *enteroblastic*, phialidic, with minute collarette, discrete or integrated, cylindrical, tapered towards the apex. *Conidia* 4.8–6.0 µm

× 2.4–3.1 µm ($\bar{x}$ = 5.4 × 2.4 µm, n = 10), numerous, dense, small, very variable from short oblong to oblong-elliptical, aseptate, hyaline, with one to many oil droplets, smooth-walled.

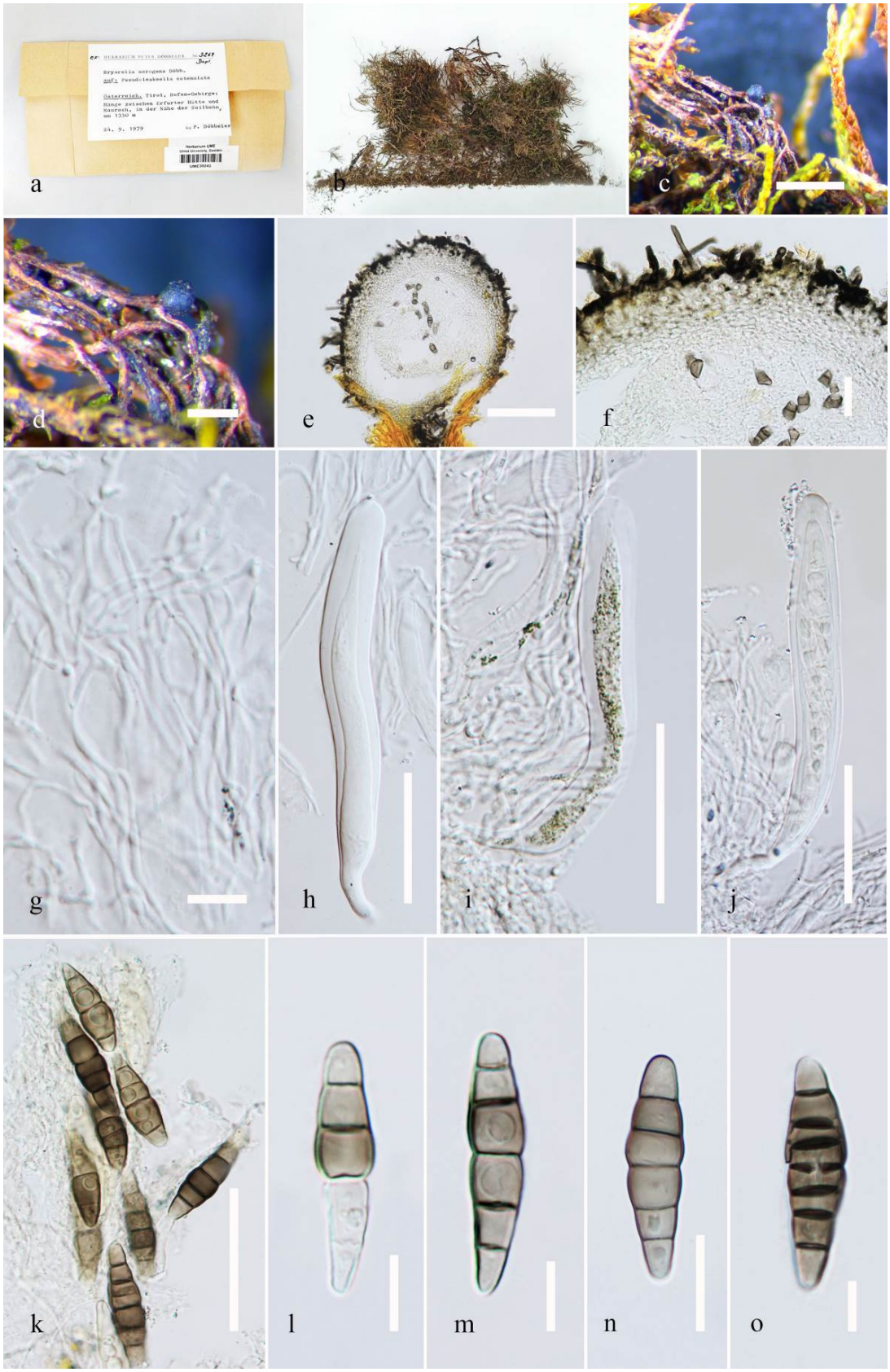

Figure 34 – *Bryorella acrogena* (UME 30243). a–d Herbarium specimen and habit on leaf. e Section of an ascoma. f Peridium g Hamathecium. h–k Asci. l–o Ascospores. Scale bars: c, d = 500 µm, e = 100 µm, f = 20 µm, g, l–o = 10 µm, h–k = 50 µm.

Material examined – ITALY, Veneto, Selva (Treviso), on leaves of the living *Cirsium arvense* (Asteraceae), August 1905, P. A. Saccardo (S-F49139, isotype).

Economic significance – The genus *Chaetosticta* has been reported to cause zonate leafspot of Cowpea (Lefebvre & Stevenson 1945). *Chaetosticta* cf. *perforata* also functions as mycorrhizae in some plants such as the orchids, especially *Trichosalpinx orbicularis* and *Trigonidium egertonianum* (Bayman & Otero 2006).

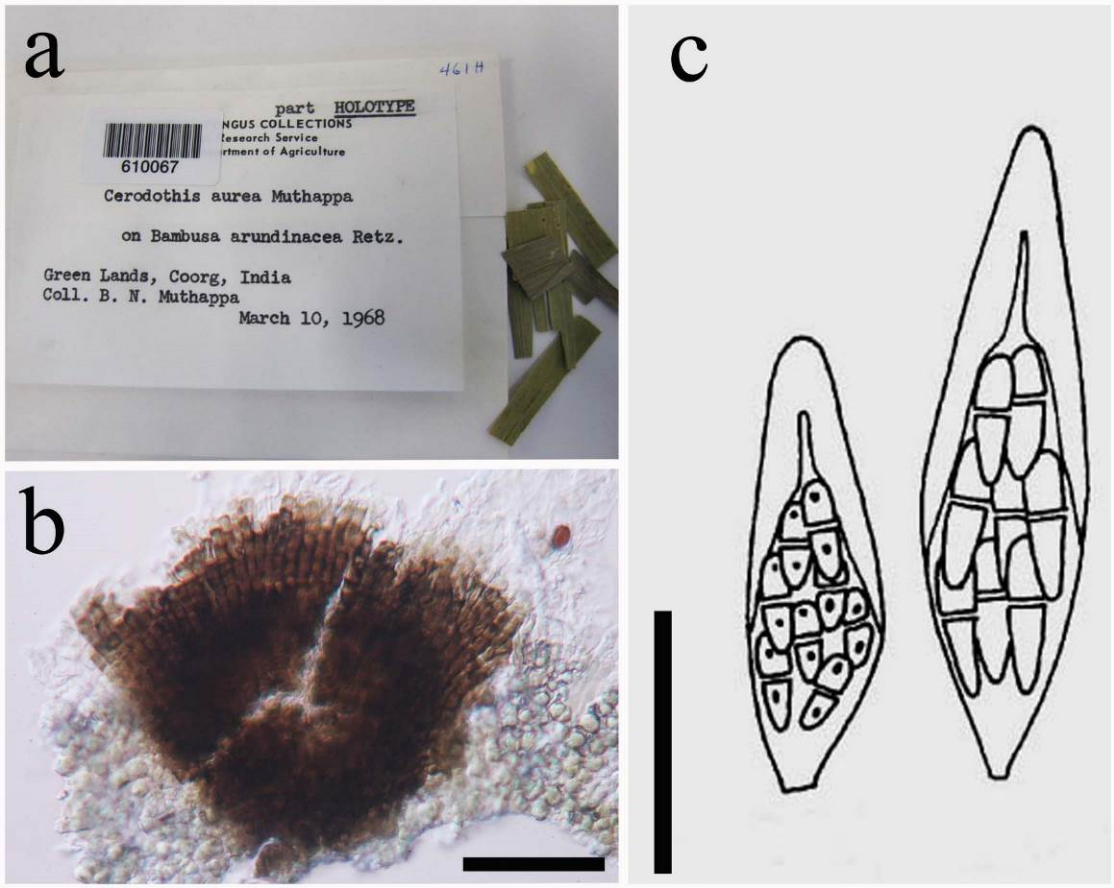

Figure 35 – *Cerodothis aurea* (BPI 610067, holotype). a Details of herbarium material. b Vertical section through ascoma. c Asci and ascospores (redrawn from Muthappa 1969). Scale bars: b = 50 µm, c = 20 µm.

Chionomyces Deighton & Piroz., *Mycol. Pap.* 128: 74 (1972)

Parasitic or *epiphytic* on the surface of living leaves. Sexual morph: Undetermined. Asexual morph: *Colonies* effuse, white, floccose. *Mycelium* hyperparasitic, consists of dark-brown to black, undulate, superficial, branched septate, thin and smooth-walled hyphae, thickly overgrowing superficial mycelium of leaf ascomycetes and bearing conidiophores as lateral branches. *Conidiophores* distributed singly or grouped onto loose fascicles, more or less erect, simple, colorless to pale brown, straight or flexuous with dense, refractive walls mainly towards the base, closely and markedly septate throughout or with the septa concentrated in the upper half, variable in length. Old *conidial scars* very slightly and evenly thickened. *Conidiogenous cells* holoblastic, percurrent, and sympodial. *Conidia* produced successively and holoblastically, one at a time from the tips of the conidiophores which proliferate percurrently by flipping the entire conidial scar to one side and growing through the opening to leave behind a series of pseudo-annellations, brown, fusiform, navicular or obclavate, attenuated towards the apex and often rostrate with a truncate unthickened hilum, 3 or more septate, smooth-walled. The conidia are firstly ovoid, then becoming elongate to produce a papillate apex. Mature conidia are spindle-shaped, colourless to brown, thin

and smooth walled, 3–5 septate, with a wide truncate base and apical cell narrowing abruptly into beak-like projections, curved and wide at apex.

Type species – *Chionomyces meliolicola* (Cif.) Deighton & Piroz.

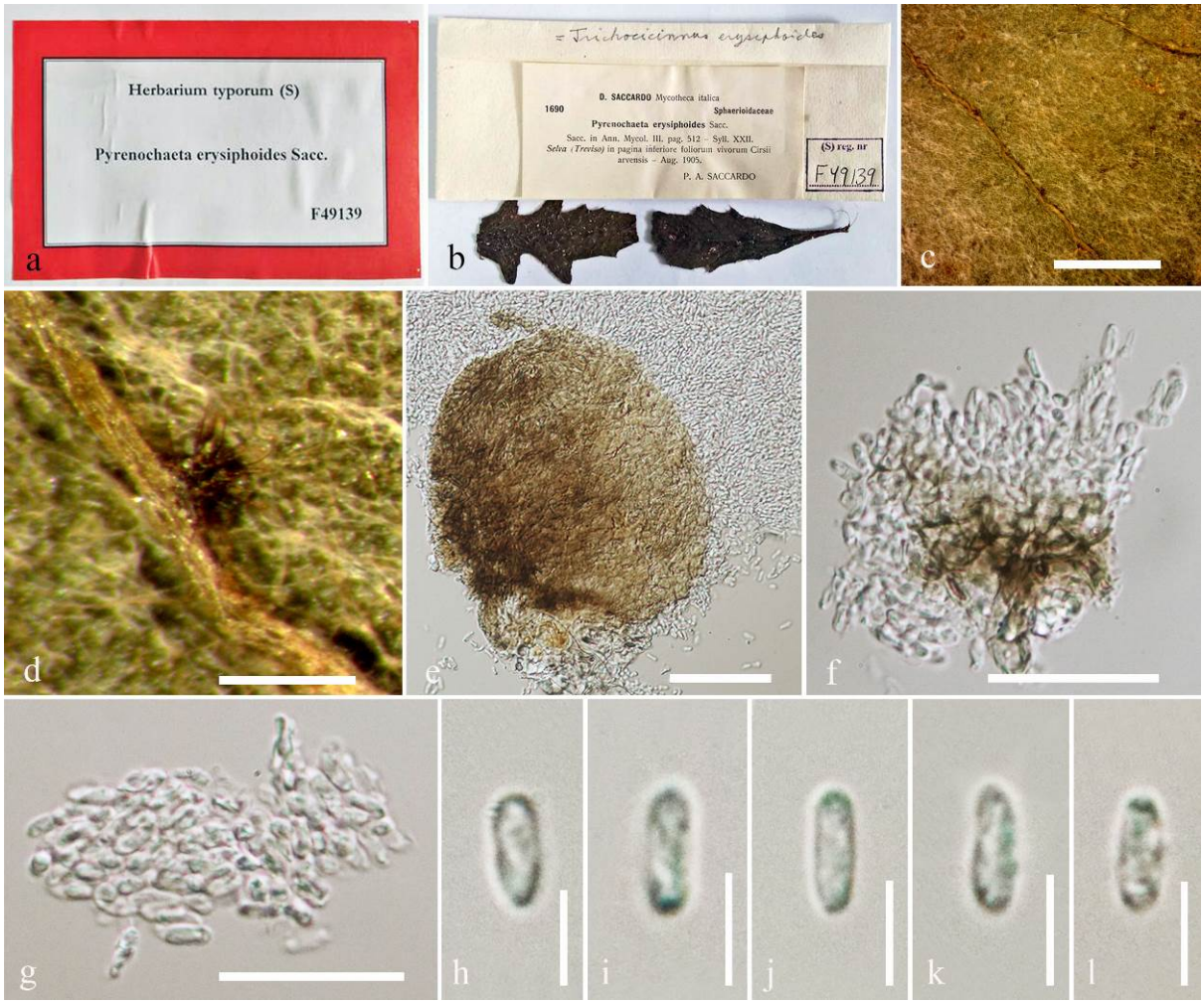

Figure 36 – *Pyrenochaeta erysiphoides* (S-F49139, isotype). a, b Details of herbarium material. c, d Habit and appearance of conidioma on host surface. e Squash mount of conidioma. f Conidiogenesis. g–l Conidia. Scale bars: c = 500 µm, d = 100 µm, e = 50 µm, f, g = 30 µm, h–l = 5 µm.

Notes – The genus *Chionomyces* was introduced for *C. meliolicola* by Deighton and Pirozynski (1972). The genus *Chionomyces* can be found on *Amazonia*, *Irenopsis* and *Meliola* spp. in tropical East and West Africa and in the Dominican Republic. Its sexual morph is so far unknown. Morphological characters defining the genus *Chionomyces* include dark-brown to black undulate, branched, septate mycelium, holoblastic, percurrent and sympodial conidiogenous cells with brown and fusiform conidia. Currently, seven species are accommodated in the genus *Chionomyces* (Index Fungorum 2019). *Chionomyces meliolicola* is distinguished from other species in the genus by having wider conidia (mostly 8–10 µm wide) which are 3–5 septate. *Chionomyces* was reported as the anamorph of the genus *Melioliphila* Speg. (1924) however, whether this association is correct is unresolved because sequences and cultures are unavailable. The specimen of *Chionomyces meliolicola*, collected from leaves of *Meliola seyboensis* is described below from PDD herbarium. It is not the type material, but it is typical of the species. The genus *Chionomyces* can be compared to *Metacapnodium* accommodated in Metacapnodiaceae wherein asexual morph occurs on subiculum and comprise hyphae with broad, dark brown cells, and chains of globose, moniliform cells, with strong constrictions at the septa. Based on

morphological study alone, we could not accommodate the genus *Chionomyces* in any family and hence we retain it in Dothideomycetes genera *incertae sedis*. Fresh specimens are required and molecular data are essential to recognize its correct placement in Ascomycota.

Chionomyces meliolicola (Cif.) Deighton & Piroz., Mycol. Pap. 128: 75 (1972) Fig. 37, 38

≡ *Monacrosporium meliolicola* Cif., Annls mycol. 36(2/3): 244 (1938)

Index Fungorum number: IF 311046; Facesoffungi number: FoF 06228

Parasitic on the surface of living leaves. Sexual morph: Undetermined. Asexual morph: *Colonies* effuse, white, floccose. *Mycelium* hyperparasitic, consists of dark-brown to black undulate, branched septate, thin and smooth-walled hyphae 3–4 µm wide, with thickly overgrowing superficial mycelium of leaf-inhabiting ascomycetes and bearing conidiophores as lateral branches. *Conidiophores* variable in length, up to 300 µm long, distributed singly or grouped onto loose fascicles, more or less erect, simple, colorless to pale brown, straight or flexuous with dense, refractive walls mainly towards the base, closely and markedly septate throughout or with the septa concentrated in the upper half, of variable in length. *Conidiogenous cells* holoblastic, percurrent, sympodial. *Conidia* 11–17 µm × 3–5 µm ($\bar{x}$ = 15.1 × 4.7 µm, n = 10) produced successively and holoblastically, one at a time from the tips of the conidiophores which proliferate percurrently by flipping the entire conidial scar to one side and growing through the opening to leave behind a series of pseudo-annellations. The conidia are firstly ovoid then elongate to produce a papillate apex. Mature conidia are spindle-shaped, colourless to brown, thin and smooth-walled, 3–5-septate, with a wide truncate base and apical cell narrowing abruptly into beak-like curved projections and wide at the apex.

Notes – The herbarium material from PDD revealed very broad conidiophore tips (about 4 µm), broad conidial bases and apical cells extending into a long tail. The mostly 4-septate conidia measured 11–17 µm × 3–5 µm. The original author had given conidial measurements as 8–10 µm.

Material examined – NEW ZEALAND, Kauaeranga Valley, on unidentified leaves, 20 January 1974, J.M. Dingley (PDD 37163).

Economic significance – Species of the genus *Chionomyces* were identified as hyper-parasitizing a Meliolales (one of the plant parasitic “black mildews") on an unidentified palm (Bronson 2018).

Chuppia Deighton, in Deighton & Pirozynski, Mycol. Pap. 101: 32 (1965)

Saprobic or *parasitic* on leaves of *solanaceous* dicotyledonous plants. Sexual morph: Undetermined. Asexual morph: Hyphomycetous. *Colonies* effuse, dark brown to black. *Mycelium* superficial, densely aggregated composed of brown, branched, septate hyphae. *Conidiophores* micronematous, mammalliform, flexuous, irregularly branched, yellow brown to dark olive brown, smooth, arising separately as lateral protrusions of swollen intercalary hyphal cells. *Conidiogenous cells* holoblastic, integrated, terminal or intercalary, determinate, cylindrical, and denticulate, with conical denticies. *Conidia* solitary, pleurogenous, simple, ellipsoidal, irregular in shape, muriform, multicellular, formed separately as blown-out ends of the sporogenous cells which ruptures when the conidium is shed, constricted at the septa, with a basal protuberant hilum, dark yellow brown, smooth to verruculose-walled.

Type species – *Chuppia sarcinifera* Deighton

Notes – The monotypic genus *Chuppia* has been established by Deighton with *C. sarcinifera* Deighton as the type species (Matsushima 1975). The latter was isolated from leaves of *Solanum lanugiflorum* in Venezuela. Deighton (1965) placed the genus *Chuppia* in the family Dematiaceae of the order Hyphomycetales. The genus is characterized by effuse, dark brown to black colonies, superficial, densely aggregated mycelium composed of brown, branched, septate hyphae, micronematous, flexuous, irregularly branched conidiophores and muriform, sarciniform conidia with protuberant hilum. Currently, two species are accommodated in the genus *Chuppia* (Index Fungorum 2019). The sexual morph is unknown. Sequences and cultures are unavailable. We re-examined the holotype specimen from CUP herbarium under the code CUP-VZ-002114 and

illustrate the morphological characters. In this study, we retain the genus *Chuppia* in Dothideomycetes genera *incertae sedis*. Fresh specimens and sequence data are required for this genus.

Figure 37 – *Chionomyces meliolicola* (PDD 37163). a, b Details of herbarium material. c Habit and appearance of ascomata on host surface. d Squash mount of mycelium. e–g Conidiophores. h, k Conidia. Scale bars: c = 500 µm, d = 10 µm, e = 50 µm, f, g = 20 µm, h–k = 5 µm.

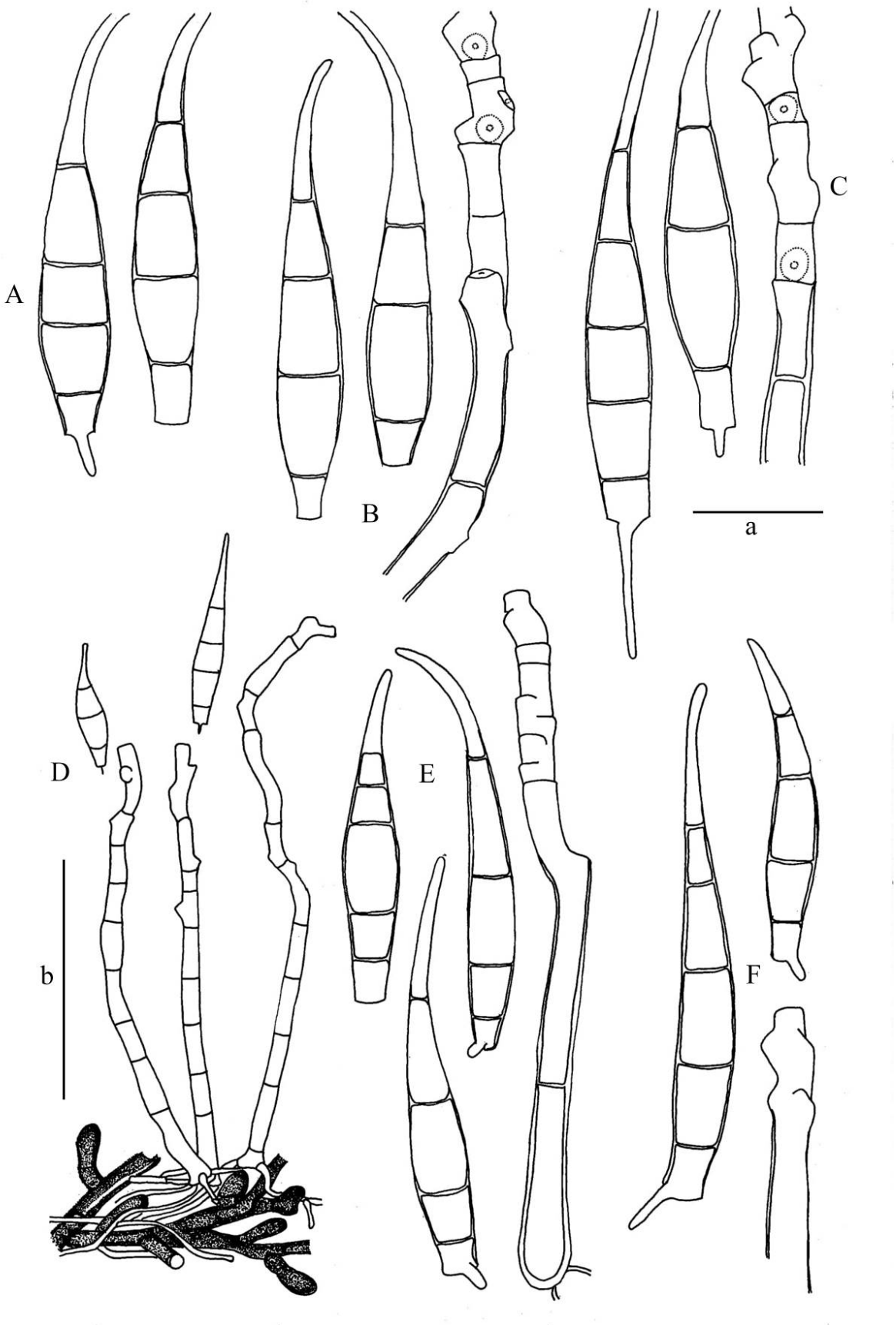

Figure 38 – *Chionomyces meliolicola* (redrawn from Deighton & Pirozynski 1972). A, from the type of *Monacrosporium meliolicola* (597425b). B, from the type of *Eriomycopsis meliolae* (18399b). C, from 4705a. D, from 5194b. E, from 37651b. F, from the type of *Eriomycopsis robusta* (8808a).

Chuppia sarcinifera Deighton, in Deighton & Pirozynski, Mycol. Pap. 101: 32 (1965)

Figs 39, 40

Index Fungorum number: IF328224; Facesoffungi number: FoF 06229

Saprobic or *parasitic* on leaves of *Solanum lanugiflorum* (Solanaceae). Sexual morph: Undetermined. Asexual morph: Hyphomycetous. *Colonies* epiphyllous, dark sooty brown, disk-shaped, with indefinite margin, numerous, covering upper surface of the leaf, often with presence of dense masses of conidia covering the leaf hairs. Sometimes, small hypophyllous colonies are present. *Mycelium* superficial composed of brown, branched, septate hyphae around 3–5 µm wide, loosely packed over the leaf surface, closely verruculose. *Conidiophores* micronematous, abundant, irregularly branched, olive brown, smooth, arising as erect continuous protrusions from swollen intercalary node-cells, dark-brown in colour with mammalliform protrusions 3–6 µm long, often ellipsoidal with formation of single conidium at the apex. *Conidiogenous cells* holoblastic, integrated, determinate, doliiform, terminal or intercalary, denticulate, yellow brown. *Conidia* 12–38 µm × 19–35 µm ($\overline{x}$ = 29.6 × 25.8 µm, n = 10) solitary, pleurogenous, initially continuous becoming ellipsoidal to irregular in shape, muriform, sarciniform, constricted at the septa with a protuberant hilum, dark brown, smooth.

Material examined – VENEZUELA, Miranda, Los Teques, Edo Miranda, on *Solanum lanugiflorum* Pitt. (Solanaceae), 11 March 1938, AS Muller (CUP-VZ-002114, holotype).

Figure 39 – *Chuppia sarcinifera* (CUP-VZ-002114, holotype). a, b Details of herbarium material. c Appearance of fungus on the host. d, e Squash mount of mycelium. f, g Conidiophores and conidia.

h–r Conidia. Scale bars: b = 500 µm, c = 200 µm, d, e = 50 µm, f, g = 30 µm, h = 20 µm, i–r = 10 µm.

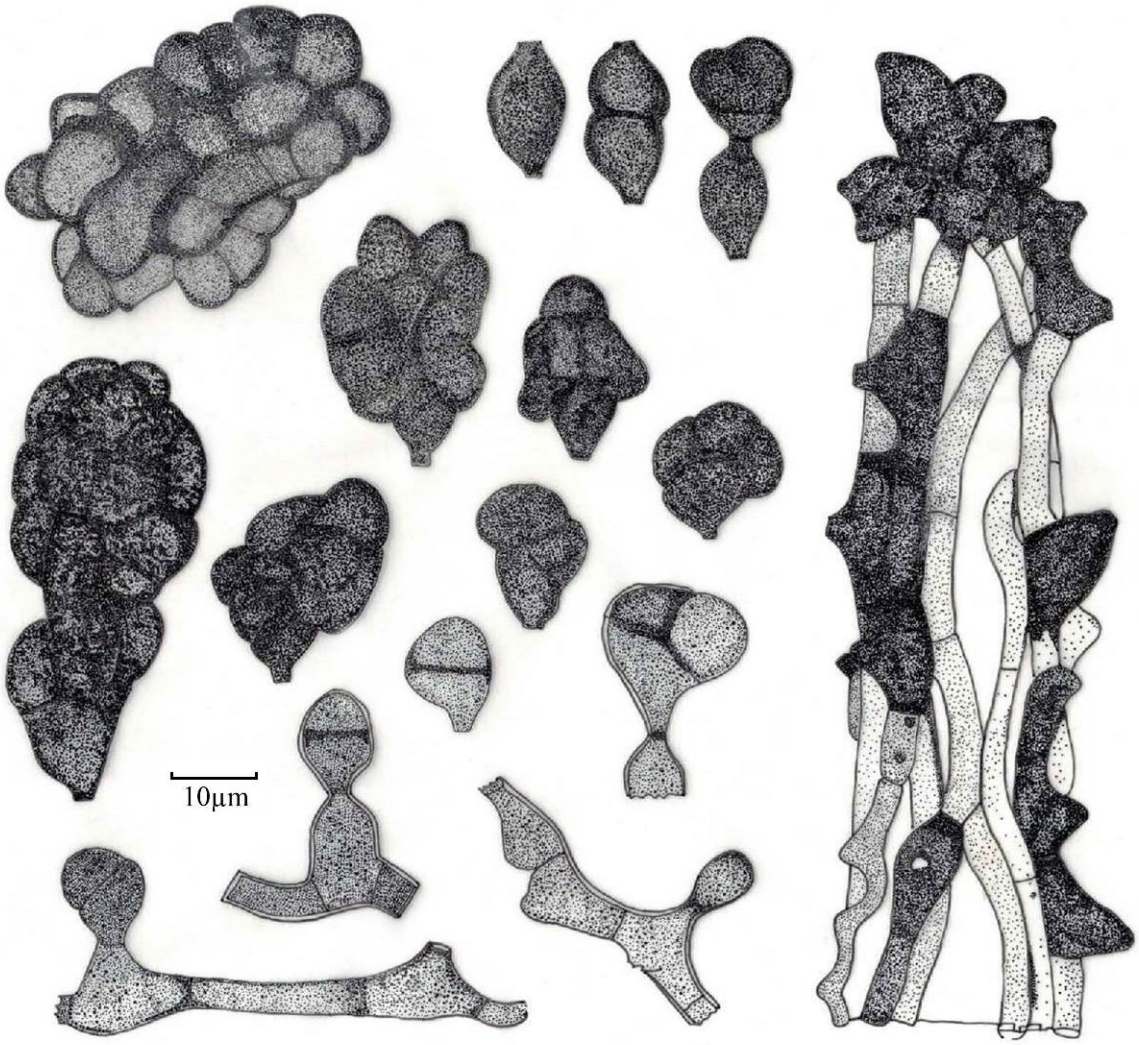

Figure 40 – *Chuppia sarcinifera* (redrawn from Deighton 1965). Scale bar: x = 10 µm

Economic significance – *Chuppia* spp. have been reported to cause white angular leafspot, a disease of cucumber (*Cucumis sativus* L) (Vargas 1977). They are also responsible for degradation of para rubber leaf litter (Seephueak et al. 2010).

Coccodothis Theiss. & Syd., Annls mycol. 12(3): 271 (1914)

Saprobic or *parasitic* on living leaves of *Juniperus* sp. Sexual morph: *Ascostromata* solitary, superficial to semi-immersed, epiphyllous, rarely hypophyllous semiorbicular to pulvinate, black. *Peridium* composed of isodiametric to polyhedric, dark brown, thick-walled cells. Presence of 3–4 loculi per ascostroma, separated from each other by a wall, composed of elongated, thick-walled, brown cells. *Paraphyses* hyaline, septate, becoming wider at their apices forming an epithecium. *Asci* bitunicate, fissitunicate, claviform, 8-spored with a distinct ocular chamber. *Ascospores* bi- to tri-seriate, 1-septate and constricted in their lower third, at first hyaline and covered by a mucous sheath, becoming brown with maturity, upper cell globose, lower cell nearly globose, wall smooth to slightly verrucose. Asexual morph: Undetermined.

Type species – *Coccodothis sphaeroidea* (Cooke) Theiss. & Syd.

Notes – The monotypic genus *Coccodothis* was introduced by Theissen & Sydow (1914) for the type species *Coccodothis sphaeroidea* (= *Dothidea sphaeroidea* Cooke 1878). The characters of the genus are epiphyllous ascostromata, peridium of isodiametric thick walled cells of *textura angularis*, claviform, bitunicate, 8-spored asci and one-septate brown ascospores. Muller & Sanwal (1954) placed the genus *Coccodothis* in the Patellariaceae, based on its similarity to the genus *Karshchia* Koerb. However, *Coccodothis* differs from this genus by its clearly formed hypostroma and a hymenium which is divided into several parts. Petrak (1954) included the genus in Polystomellaceae, whereas Muller & von Arx (1962) suggested its inclusion in the Parmulariaceae based on its parasitic lifestyle. Hyde et al. (2013) excluded the genus *Coccodothis* from Parmulariaceae and accepted it as a genus in *Dothideomycetes*, genera *incertae sedis* (Wijayawardene et al. 2014). Cultures and sequences are unavailable. We re-studied the isotype specimen of *Coccodothis sphaeroidea* from S herbarium under the code S-F51270 and illustrate the morphological characters of the genus. The species lack sequence data. We therefore, retain the genus in Dothideomycetes, genera *incertae sedis*.

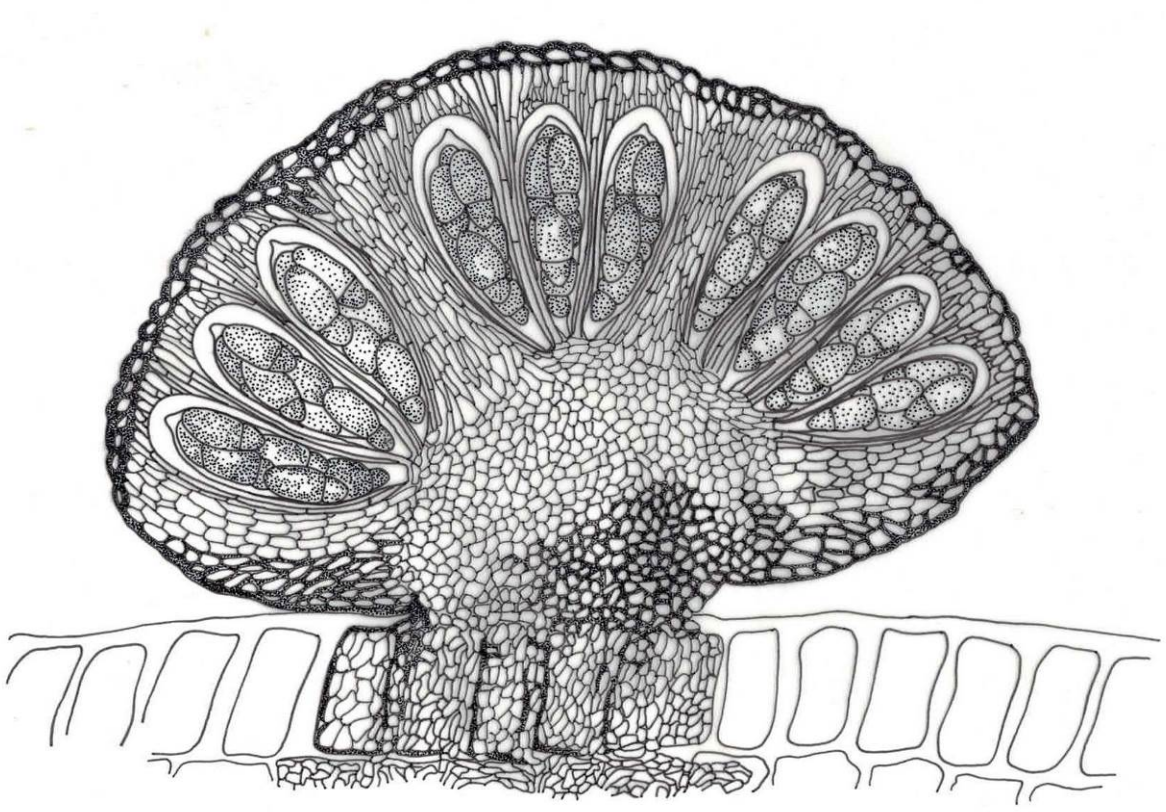

Figure 41 – Section through a stroma of *Coccodothis sphaeroidea*. (redrawn from Muller & Sanwal 1954)

Coccodothis sphaeroidea (Cooke) Theiss. & Syd., Annls mycol. 12(3): 271 (1914) Fig. 41, 42

≡ *Dothidea sphaeroidea* Cooke, Grevillea 7(no. 42): 50 (1878)

Index Fungorum number: IF 153862; Facesoffungi number: FoF 06230

Saprobic or *parasitic* on living leaves of *Juniperus* sp. Sexual morph: *Ascostromata* solitary, superficial to semi-immersed, epiphyllous, rarely hypophyllous, 70–102 µm high × 75–102 µm diam., semiorbicular to pulvinate, black. *Peridium* 10–17 µm, composed of isodiametric to polyhedric, dark brown, thick-walled cells of *textura angularis*, presence of 3–4 locules per ascostroma, separated from each other by a wall, 20–30 µm wide, composed of elongated, thick-walled, brown cells. *Paraphyses* 1–2 µm wide, becoming wider at their apices forming an epithecium, septate, hyaline. *Asci* 47–54 µm × 23–25 µm ($\bar{x}$ = 50 × 25 µm, n = 20) bitunicate, fissitunicate, claviform, 8-spored with a distinct ocular chamber. *Ascospores* 18–20 µm × 8–10 µm

($\bar{x}$ = 19 × 9 µm, n = 20), bi- to triseriate, 1–septate and constricted in their lower third, at first hyaline and covered by a mucous sheath, becoming brown with maturity, upper cell globose 9–13 µm diam., lower cell nearly globose 7–8 diam., wall smooth to slightly verrucose. Asexual morph: Undetermined.

Material examined – USA, Georgia, Darien, on living leaves of *Juniperus* sp. (Cupressaceae), 1993, H. W. Ravenel (S-F51270, isotype).

Economic significance – The genus *Coccodothis* comprises fungi which are parasitic on *Juniperus* species (Marmolejo et al. 1997).

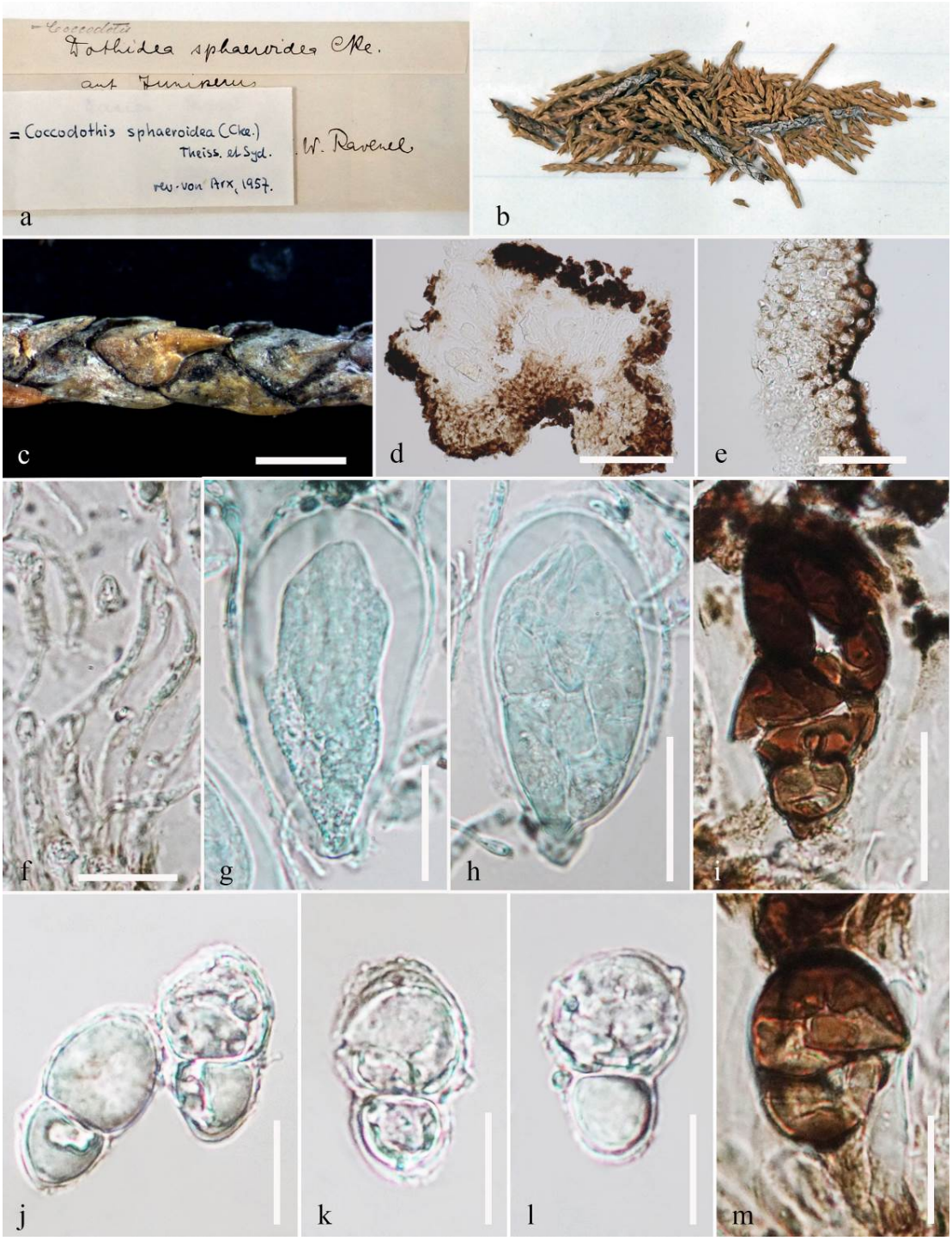

Figure 42 – *Coccodothis sphaeroidea* (S-F51270, isotype). a, b Details of herbarium material. c Appearance of ascomata on host surface. d Section of ascoma e Peridium. f Hamathecium. g–i Asci. j–m Ascospores. Scale bars: c = 500 µm, d = 100 µm, e, g–h = 20 µm, f, j–m = 10 µm.

Dermatodothis Racib. ex Theiss. & Syd., Annls mycol. 12(3): 280 (1914)

Saprobic or *parasitic* on leaves of *Symplocos* sp. Sexual morph: *Pseudothecia* epiphyllous, scattered, solitary, or in small groups, gregarious, carbonaceous, subcuticular, hemispheric, postulate, more or less lenticular or conical, single or multiple to a flat, forming leaf spot, dark brown to black sometimes confluent, with superficial mycelial surrounding the pseudothecia. *Peridium* coriaceous, pseudoparanchymatous, thick-walled, dark-brown, thick in the upper part, becoming thicker towards the basal part of the lateral wall. *Hypostroma* subcuticular, composed of 1–2 layers of hyaline, palisadely arranged cells. *Ascospores* fusiform to elliptical, 2-septate, constricted at each septum, hyaline to pale brown. Asexual morph: Undetermined.

Type species – *Dermatodothis javanica* Racib.

Notes – The genus *Dermatodothis* was introduced by Raciborsky and afterwards described by Theissen & Sydow (1914, 1915) with *D. javanica* as the type species. The genus is characterized by epiphyllous pseudothecia, elongate to ovoid, pale brown and 2-transversely septate ascospores. The asexual morph is unknown. Cultures and sequences are unavailable. According to Von Arx and Muller (1975), *Dermatodothis* belongs to Pleosporaceae in the vicinity of *Leptosphaeria* Ces. et De Not. However, the genus *Dermatodothis* differs from *Leptosphaeria* by the nature of its occurrence on living leaves, the very thick-walled, but relatively small cells of the peridium and by the stromata. We re-examined a specimen of *Dermatodothis javanica* from CUP herbarium under the code CUP-CH-001276 as the holotype specimen cannot be found. This genus could not be assigned to any family and a new family could not be introduced herein because all morphological characters could not be observed and sequence data are unavailable. We retain the genus in Dothideomycetes, genera *incertae sedis*. Further studies and new collections are required for this genus.

Dermatodothis javanica Racib., in Theissen & Sydow, Annls mycol. 12(3): 280 (1914)

Figs 43, 44

Index Fungorum number: IF 153862; Facesoffungi number: FoF 06231

Saprobic or *parasitic* on leaves of *Symplocos* sp. Sexual morph: *Pseudothecia* 304–980 µm high × 283–969 µm diam., epiphyllous, scattered, solitary, or in small groups, gregarious, carbonaceous, subcuticular, hemispheric, postulate, more or less lenticular or conical, single or multiple to a flat, forming leaf spot, dark brown to black sometimes confluent, with superficial mycelial surrounding the pseudothecia. *Peridium* coriaceous, pseudoparanchymatous, thick-walled, dark-brown, thick in the upper part, becoming thicker towards the basal part of the lateral wall. *Hypostroma* subcuticular, composed of 1–2 layers of hyaline, palisadely arranged cells. *Asci* not observed. *Ascospores* 20–26 µm × 3–5 µm ($\overline{x}$ = 23.6 × 4.2 µm, n = 10), fusiform to elliptical, 3-septate, constricted at the septa, hyaline to pale brown. Asexual morph: Undetermined.

Material examined – CHINA, Hainan, Ling-shui, on leaves of *Symplocos* sp (Symplocaceae), 25 May 1934, SQ Deng (CUP-CH-001276).

Notes – The asci of *Dermatodothis javanica* could not be observed from the herbarium specimen. We illustrate a drawing of the asci of *Dermatodothis javanica* as reported by Hsieh & Chen (1993) and a section of the stroma as reported by Müller (1975). The ascospores as described by Hsieh and Chen (1993) are 2-septate, but the specimen we observed has 3-septate ascospores which are same as reported by Raciborsky (1914) and Müller (1975).

Economic significance – The genus *Dermatodothis* has been reported to be associated with hosts in the wet tropics of northern Queensland and causes dark-brown to black spots on hosts (Shivas & Alcorn 1996).

Dianesea Inácio & P.F. Cannon, Fungal Diversity 9: 72 (2002)

Saprobic on unidentified palm. *Hemi-biotrophic* as small leaf spots dispersed, rarely confluent, amphigenous, flat, black, variable in shape, generally elliptical, sometimes circular or irregular, forming dark brown to black leaf spots. Sexual morph: *Ascostromata* solitary, scattered, superficial to sometimes semi-immersed, conical, with single locule, ostiolate, coriaceous. *Ostiole*

typically widely porate, broadly papillate. *Peridium* comprising several layers of brown and thick-walled cells of *textura angularis*. *Hamathecium* composed of 1–2 µm diam., of relatively thin, densely anastomosing, septate, branching, interascal pseudoparaphyses. *Asci* 8-spored, bitunicate, clavate to subcylindrical, with a short, narrow pedicel, thickened and rounded at the apex, with an ocular chamber. *Ascospores* uniseriate to partially overlapping, hyaline to pale olivaceous when immature, dark brown when mature, ellipsoidal or cylindrical to clavate, 1-septate, conspicuously constricted at the septum, smooth and thick-walled, surrounded by hyaline mucous sheath. Asexual morph: Coelomyceteous. *Conidiomata* variable in shape, pycnothyrial, subglobose to globose or elliptical, solitary, scattered, immersed to semi-immersed. *Conidiophores* indistinct. *Conidiogenous cells* holoblastic, enteroblastic, annellidic, cylindrical, and smooth. *Conidia* hyaline to greenish, cylindrical, straight or slightly curved, obtuse at apex, with small guttules.

Type species – *Dianesea palmae* (F. Stevens) Inácio & P.F. Cannon

Notes – The monotypic genus *Dianesea* was introduced by Inácio & Cannon (2002) for the type species *Dianesea palmae* which was previously known as *Cocconia palmae*. The latter was isolated from an unidentified palm in Costa Rica. The genus *Dianesea* is morphologically characterized by crustose, globose to subglobose ascostromata, clavate to subcylindrical 8-spored asci, ellipsoidal or cylindrical to clavate pale olivaceous 1-septate ascospores surrounded by hyaline mucous sheath. Cultures and sequences are unavailable. In this study, we re-examined the holotype specimen of *Dianesea palmae* (= *Cocconia palmae*). We observed both the sexual and asexual morphs. The sexual morph of the genus *Dianesea* resembles the genus *Metameris* (Botryosphaeriacae) except in spore morphology, particularly the narrow ascospores with a hyaline mucous sheath (Jayasiri et al. 2016). Species of *Coccoidea* Henn. resemble species of *Dianesea*, but the ascomata are formed as multiple distinct locules in peltate stromata, and the anamorph is acervular rather than locular (stromatic). The genus *Coccoidea* also has ascospores which are septate with septa close to the ends, in contrast to those of *Dianesea* where they have a ± median septum (Eriksson, 1981, Barr 1987, Sivanesan 1987, Kirk et al. 2001). The genus *Rosenscheldiella* also resembles *Dianesea* with its external stromatal shape, however these contain multiple ascomatal locules which produce colourless ascospores, but lack a distinct periphysate ostiole (Barr 1987). We therefore retain the genus *Dianesea* in Dothideomycetes, genera *incertae sedis*.

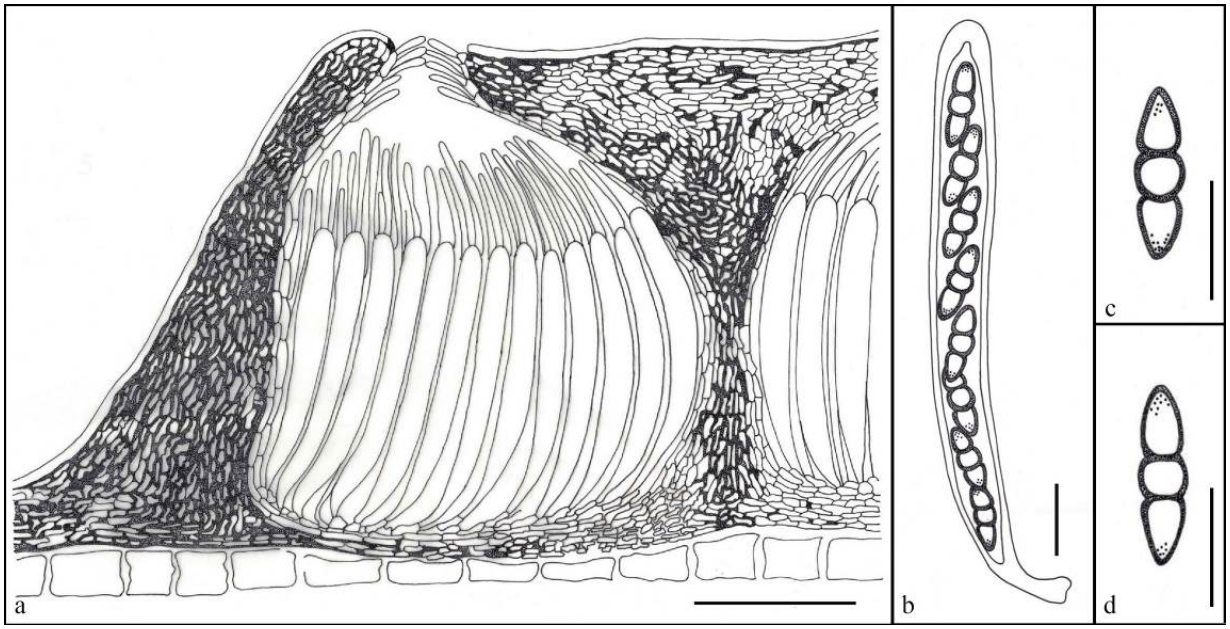

Figure 43 – A section through a stromal part of *Dermatodothis javanica* with two fruiting body cavities (redrawn from Müller (1975). b–d Asci and ascospores of *Dermatodothis javanica* (redrawn from Hsieh & Chen 1993). Scale bar : a = 50 µm, b–d = 10 µm.

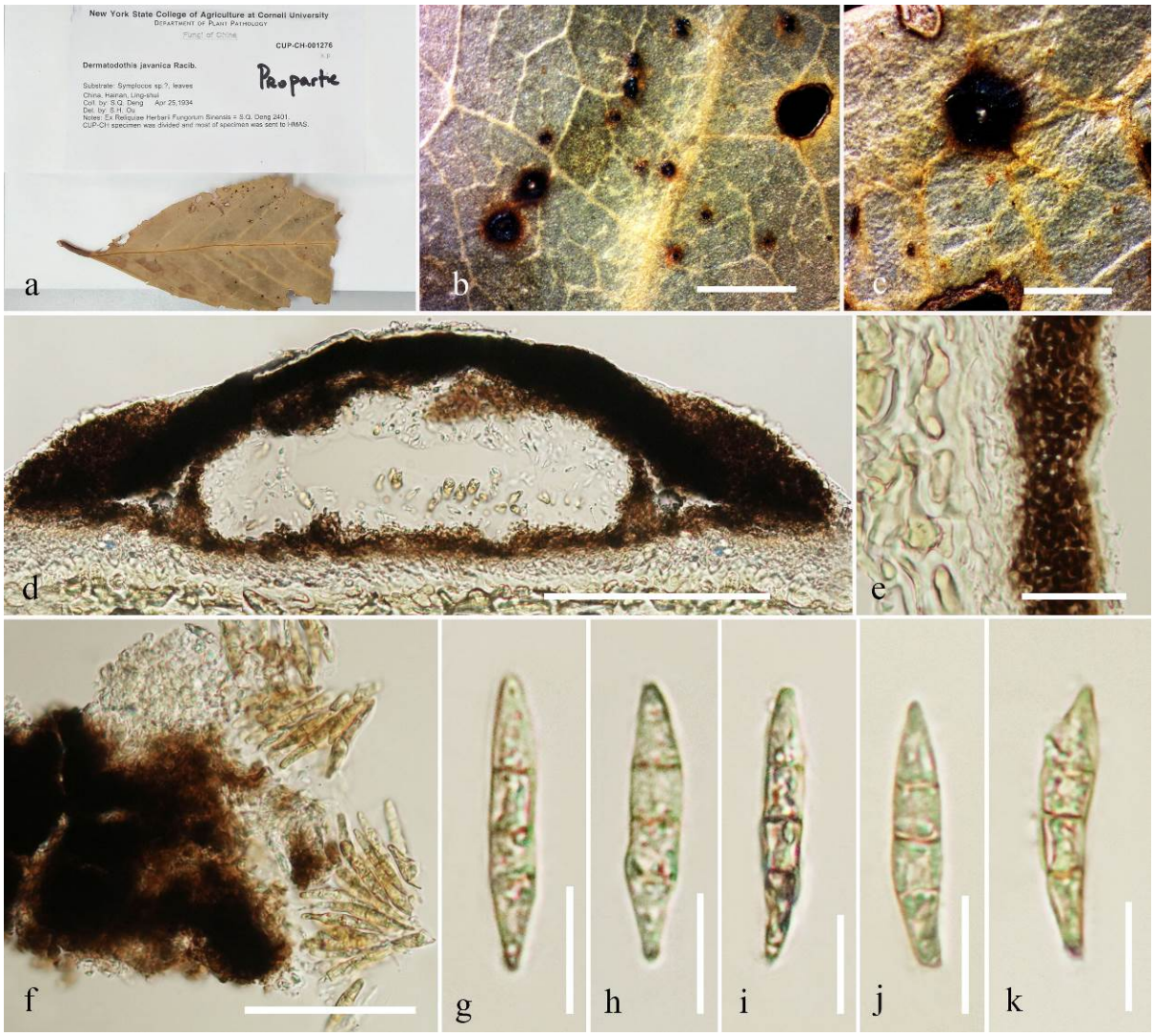

Figure 44 – *Dermatodothis javanica* (CUP-CH-001276). a Details of herbarium material. b, c Habit and appearance of ascomata on host surface. d Section of ascoma. e Peridium. f Squash mounts of ascoma. g–k Ascospores. Scale bars: b = 2 mm, c = 1 mm, d = 100 µm, e = 20 µm, f = 50 µm, g–k = 10 µm.

Dianesea palmae (F. Stevens) Inácio& P.F. Cannon, Fungal Diversity 9: 72 (2002) Figs 45, 46

= *Cocconia palmae* F. Stevens, Illinois Biol. Monogr. (Urbana) 11(no. 2): 175 (1927)

Index Fungorum number: IF374776; Facesoffungi number: FoF 06232

Saprobic on palm stems. *Hemi-biotrophic* as small leaf spots 1 mm long × 2 mm wide, dispersed, rarely confluent, amphigenous, flat, black, variable in shape, generally elliptical, but sometimes circular or irregular forming dark brown to black leaf spots. Sexual morph: *Ascostromata* 1.6–2.2 mm high × 1.0–1.2 mm diam., solitary, scattered, superficial to sometimes semi-immersed, conical, with single locule, ostiolate, coriaceous. *Ostiole* typically widely porate, broadly papillate. *Stromatal wall* dense, thick, composed of brown-walled cells 3–7 µm diam, globose around the edge and angular and slightly larger in the central part. *Peridium* 24–41 µm, comprising several layers of brown and thick-walled cells of *textura angularis*. *Hamathecium* composed of 1–2 µm diam., of relatively thin, dense, anastomosing, septate, branching interascal pseudoparaphyses. *Asci* 52–74 µm × 13–16 µm ($\overline{x}$ = 57.2 × 14.8 µm, n = 10), 8-spored, bitunicate, clavate to subcylindrical, with a short, narrow pedicel, thickened and rounded at apex, with an ocular chamber. *Ascospores* 12–15 µm × 3–5 µm ($\overline{x}$ = 13.8 × 4.3 µm, n = 10), uniseriate to partially overlapping, hyaline to pale olivaceous when immature, dark brown when mature, ellipsoidal or cylindrical to clavate, 1-septate, conspicuously constricted at the septum, smooth and

thick-walled, surrounded by gelatinous layer, verrucose, cylindric, ellipsoidal, the lower cell slightly attenuated and rounded towards the base, the upper cell with a rounded apex. Asexual morph: *Conidiomata* 1.6–2.2 mm high × 1.0–1.2 mm diam., variable in shape, pycnothyrial, subglobose to globose or elliptical, solitary, scattered, immersed to semi-immersed. *Conidiophores* indistinct. *Conidiogenous cells* 3.3–5.5 µm × 2.6–2.7 µm ($\overline{x}$ = 4.4 × 2.7 µm, n = 10) holoblastic, annellidic, discrete, cylindrical, and smooth-walled. *Conidia* 11–13 µm × 3–4 µm ($\overline{x}$ = 12.7 × 3.5 µm, n = 10) hyaline to greenish, cylindrical, straight or slightly curved, obtuse at the apex, with small guttules.

Material examined – COSTA RICA, Peralta, on palm leaves, 13 July 1923, F.L. Stevens (NY 01089812, holotype).

Economic significance – None is reported.

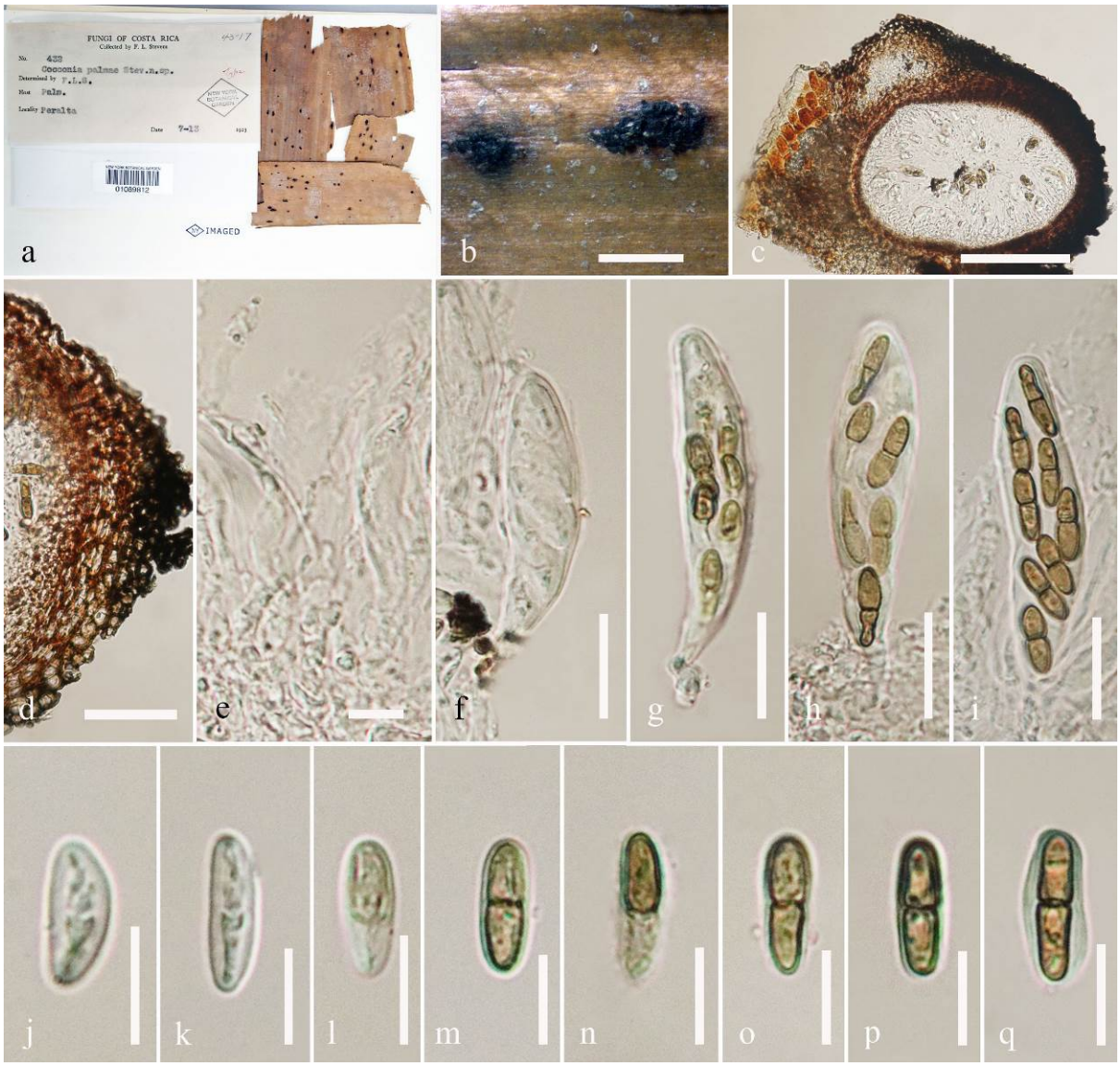

Figure 45 – *Dianesea palmae*; Sexual morph (NY 01089812, holotype). a Details of herbarium material. b Habit and appearance of ascomata on host surface. c Section of ascoma. d Peridium. e Hamathecium. f–i Asci. j–q Ascospores. Scale bars: b = 2 mm, c = 100 µm, d = 30 µm, e, j–q = 10 µm, f–i = 20 µm.

Didymocyrtidium Vain., Acta Soc. Fauna Flora fenn. 49(no. 2): 228 (1921)

Saprobic on growing stem of unidentified trees. Sexual morph: *Ascomata* semi immersed to superficial on host surface, simple, visible as dark brown to black circle on host surface. *Peridium*

thick-walled, composed of several layers of dark-brown cells of *textura angularis*. *Hamathecium* present, with cellular, branching, pseudoparaphyses, anastomosing, branching, embedded in mucilaginous matrix, sometimes aparaphysate, covering asci by gelatinous matrix. *Asci* bitunicate, fissitunicate, 8-spored, ovoid to saccate, sessile with indistinct ocular chamber, thick-walled. *Ascospores* crowded, or irregularly arranged in the ascus, oblong or oval to ellipsoid, hyaline to subhyaline 1-septate, very slightly constricted at the septum, smooth or rough-walled. Asexual morph: Undetermined.

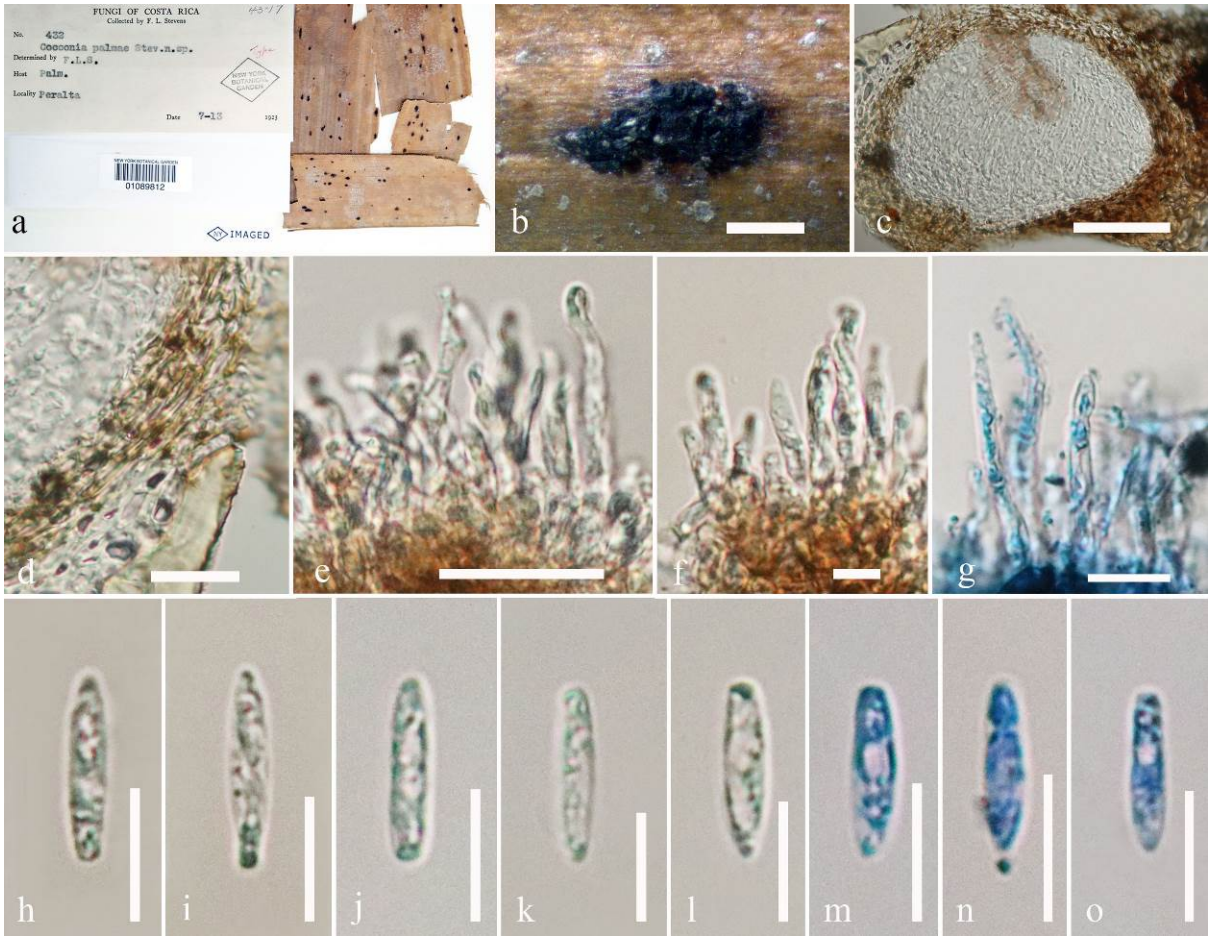

Figure 46 – *Dianesea palmae*; asexual morph (NY 01089812, holotype). a Details of herbarium material. b Habit and appearance of ascomata on host surface. c Section of conidioma. d Peridium. e–g Conidiogenesis h–o Conidia. Note: g, m–o stained in lactophenol cotton blue. Scale bars: b = 1 mm, c = 50 µm, d, e, g–o = 10 µm, f = 20 µm.

Type species – *Didymocyrtidium nudum* Vain.

Notes – The genus *Didymocyrtidium* was introduced by Vainio (1921) to accommodate three species namely *Didymocyrtidium mozambicum* Vain, *Didymocyrtidium nudum* and *Didymocyrtidium populnellum*. The major morphological characters of the genus are semi-immersed to superficial ascomata and unique subhyaline or pale greenish, 1-septate ascospores. The asexual morph is unknown. Cultures and sequences are unavailable. No type species was assigned to this genus. In the original description, the authors described *Didymocyrtidium populnellum* as a synonym of *Mycoporum populnellum* Nyl. However, according to index fungorum, *Mycoporum populnellum* is accommodated in its own family Mycoporaceae. We re-examined the holotype specimen of *Didymocyrtidium populnellum* (= *Mycoporum populnellum*) under the code F216647 from S herbarium. Upon examination of the specimen, we observed two fungi. One of them (Fig. 47) is characterised by semi-immersed to superficial simple, black ascomata on host surface with ovoid to saccate asci and hyaline to subhyaline 1-septate ascospores

which match the description of *Didymocyrtidium populnellum* as given by Vainio (1921), while the other fungus (Fig. 48) is characterised by semi-immersed to superficial apothecia on its host surface, uni-loculate, forming pseudostroma or clypeus, 4-spored bitunicate asci with subhyaline or pale greenish, 3–4-septate ascospores which seems to be *Mycoporum populnellum*. The ascopores of *Mycoporum populnellum* were illustrated as 3–4-septate in a work by Millot (1899), while Nylander (1873) described the ascospores of *M. populnellum* as 1-septate. Hence, we cannot typify the genus *Didymocyrtidium* with the above specimen. We studied the syntype specimen of *Didymocyrtidium nudum* Vain. from H herbarium under the code H6022676 and illustrate the characters (Fig 42). Hence, in this study we typify the genus *Didymocyrtidium* with the type specimen *Didymocyrtidium nudum*. We also report that *Didymocyrtidium populnellum* and *Mycoporum populnellum* are two different taxa. We provide an updated illustration for *Didymocyrtidium populnellum*, *Mycoporum populnellum* and *Didymocyrtidium nudum*. We retain the genus *Didymocyrtidium* in Dothideomycetes, genera *incertae sedis* until sequence data becomes available.

Didymocyrtidium populnellum Vain., Acta Soc. Fauna Flora fenn. 49 (no. 2): 229 (1921) Fig. 47

Index Fungorum number: IF 384341; Facesoffungi number: FoF 06233

Saprobic on growing stems of unidentified trees. Sexual morph: *Ascomata* 10–35 µm × 35–45 µm ($\overline{x}$ = 35.2 × 38.9 µm, n = 10), semi-immersed to superficial on host surface, simple, visible as dark brown to black circle on host surface. *Peridium* thick-walled, composed of several layers of dark-brown cells of *textura angularis*. *Hamathecium* present, with cellular pseudoparaphyses, anastomosing, branching, embedded in mucilaginous matrix, sometimes aparaphysate, covering asci by gelatinous matrix. *Asci* 25–31 µm × 15–17 µm ($\overline{x}$ = 28.4 × 16.4 µm, n = 10), bitunicate, fissitunicate, 8-spored, ovoid to saccate, sessile with indistinct ocular chamber, thick-walled. *Ascospores* 9–10 µm × 3–4 µm ($\overline{x}$ = 9.2 × 3.9 µm, n = 10), bi-to tri-seriate, or crowded, oval to ellipsoid, hyaline to subhyaline 1-septate, very slightly constricted at the septum, smooth or rough-walled. Asexual morph: Undetermined.

Material examined – FINLAND, Etelä-Häme, Tavastia, Asikkala, on stems of unidentified trees, June 1892, J.P. Norrlin (1866) (S-F216647, holotype).

Economic significance – None is reported.

Didymocyrtidium nudum Vain., Acta Soc. Fauna Flora fenn. 49(no. 2): 229 (1921) Fig. 49

Index Fungorum number: IF 557075; Facesoffungi number: FoF 07131

Saprobic on growing stems of *Betula* sp. Sexual morph: *Ascomata* 29–40 µm high × 36–43 µm diam., ($\overline{x}$ = 38.2 × 39.9 µm, n = 10), semi immersed to superficial on host surface, simple, visible as dark brown to black circle on host surface. *Peridium* 9–11 µm wide thick-walled, composed of several layers of dark-brown cells of *textura angularis*. *Hamathecium* 2–3 µm wide present, with cellular pseudoparaphyses, anastomosing, branching, embedded in mucilaginous matrix, sometimes aparaphysate, covering asci by gelatinous matrix. *Asci* 30–32 µm × 16–18 µm ($\overline{x}$ = 31.4 × 17.4 µm, n = 10), bitunicate, fissitunicate, 8-spored, ovoid to saccate, sessile with indistinct ocular chamber, thick-walled. *Ascospores* 10–12 µm × 3–4 µm ($\overline{x}$ = 11.5 × 3.9 µm, n = 10), bi-to tri-seriated, or overlapping, oblong to cylindrical or ellipsoid, hyaline to subhyaline 1-septate, very slightly constricted at the septum, smooth or rough-walled. Asexual morph: Undetermined.

Material examined – RUSSIA, on stems of *Betula* sp. (Betulaceae), 16 July 1928, E. Häyrén (H6022676, syntype)

Economic significance – None is reported.

Dothichiza Lib. ex Roum., Fungi Selecti Galliaei Exs.: no. 627 (1880)

Pathogenic on various substrates of a range of host plants. Sexual morph: Undetermined. Asexual morph: *Conidiomata* numerous in the bark, stromatic, initially in pustules covered by

epidermis of the host, rupturing at the top when mature, immersed to sub-peridermal, solitary, multilocular and convoluted, often irregular in shape, dark brown to black, ostiolate. *Conidiomata wall* 11.2–26.6 µm wide with irregular surface at the base on the inside,outer layer composed of 2–3 layers of brown cells of *textura angularis*, inner layer composed of hyaline-walled cells of *textura angularis*. *Conidiophores* hyaline, branched at the base, septate, smooth, hyaline. *Conidiogenous cells* enteroblastic, phialidic, cylindrical, indeterminate, integrated or discrete, hyaline, smooth. *Conidia* cylindrical, subglobose to ovoid, or rarely ellipsoid, obtuse at apex, truncate or rounded at base, aseptate, creamy to tanny olive or pale brown, median guttulate, thick and smooth-walled.

Figure 47 – *Didymocyrtidium populnellum* (S-F216647, holotype). a Details of herbarium material. b, c Habit and appearance of ascomata on host surface. d Section of ascoma. e Peridium. f Hamathecium. g–j Asci. k–n Ascospores. Scale bars: c = 2 mm, d = 50 µm, e–j = 10 µm, k–n = 5 µm.

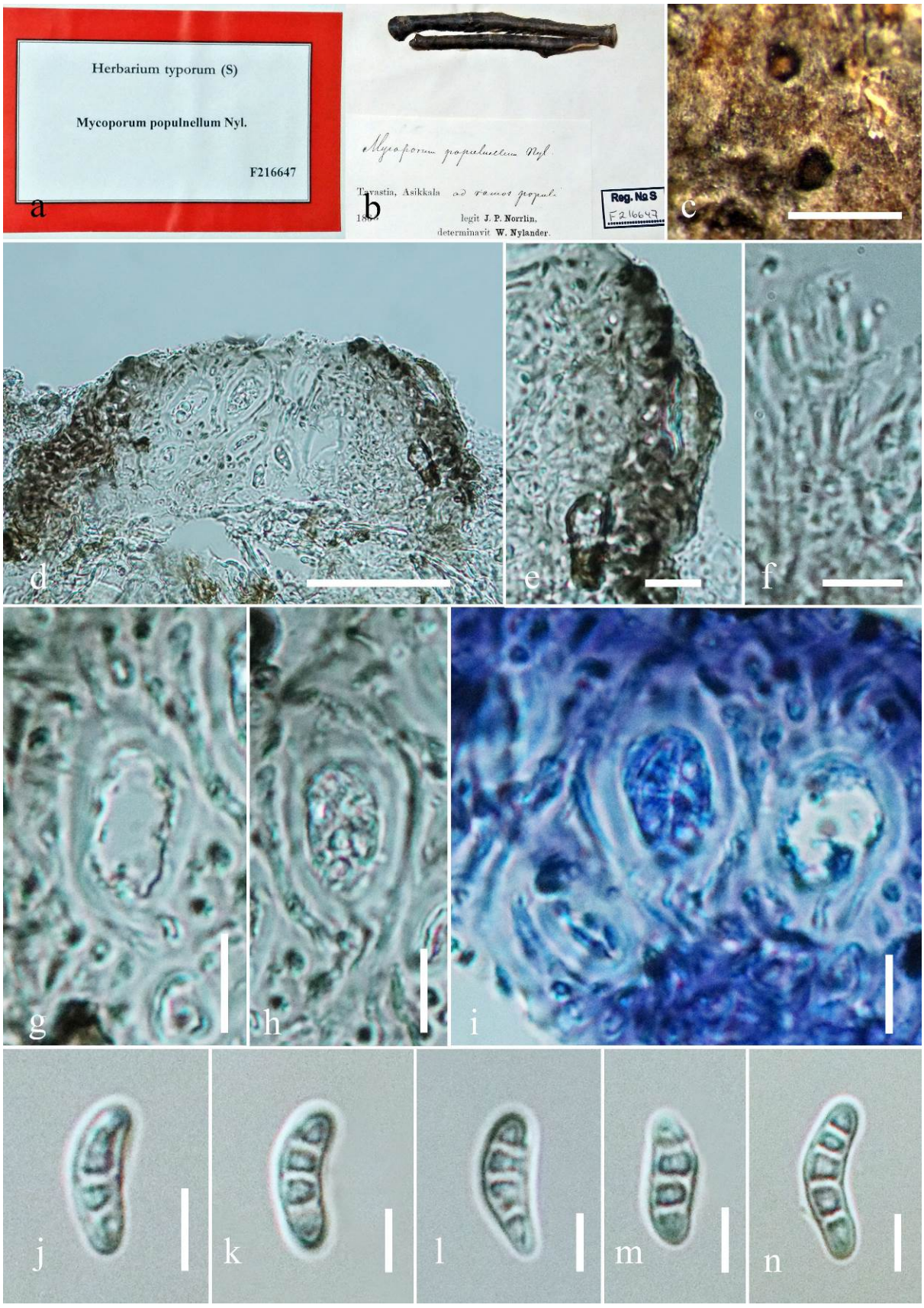

Figure 48 – *Mycoporum populnellum* (S-F216647, holotype). a Details of herbarium material. b, c Habit and appearance of ascomata on host surface. d Section of ascoma. e Peridium. f Hamathecium. g–i Asci. j–n Ascospores. Scale bars: b = 2 mm, c = 1 mm, d = 50 µm, e–i = 10 µm, f, j–n = 5 µm.

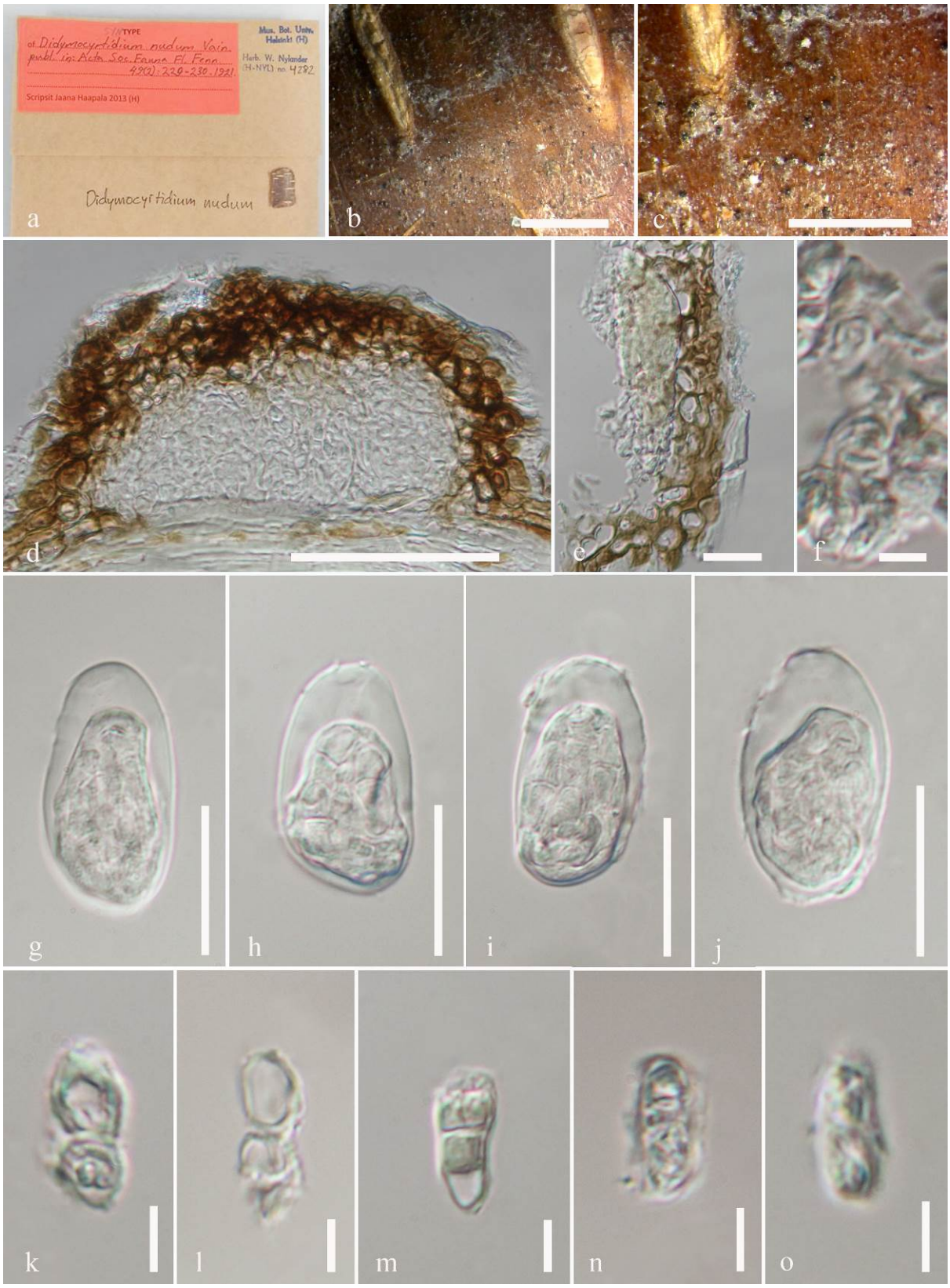

Figure 49 – *Didymocyrtidium nudum* (H6022676, syntype). a Details of herbarium material. b, c Habit and appearance of ascomata on host surface. d Section of ascoma. e Peridium. f Hamathecium g–j Asci k–o Ascospores. Scale bars: b, c = 500 µm, d = 50 µm, e = 10 µm, f, k–o = 5 µm, g–j = 20 µm.

Type species – *Dothichiza populea* Sacc. & Briard

Notes – The genus *Dothichiza* was introduced by Libert & Roumegère (1880) for the type

species *D. populea*, isolated from dead branches of *Populus* sp. *Dothichiza populea* was initially described and named in Saccardo & Briard (1884) who reported the fungus as a saprobe on dead branches of *Populus* at Troyes, France. The genus is characterized by numerous convoluted conidiomata, firstly in pustules, covered by the epidermis of the host, later rupturing at the top when mature and cylindrical, subglobose to ovoid conidia. Currently, 15 epithets are accommodated under the genus *Dothichiza* (Index Fungorum 2019). There is no report of a sexual morph. The genus *Dothichiza* shares morphological similarities to *Cyclothyrium* in having immersed to sub-peridermal conidiomata, a conidiomatal wall of brown cells of *textura angularis*, hyaline, branched conidiophores, enteroblastic, phialidic, cylindrical conidiogeneous cells and cylindrical pale brown conidia. The genus is also morphologically similar to coniothyrium-like taxa, such as *Coniothyrium*, *Cytoplea* and *Microsphaeropsis* (Sutton 1971, 1980, Verkley et al. 2004, 2014, de Gruyter et al. 2013). *Dothichiza* was previously accommodated in Dothioraceae. Cultures and sequences are available. In our phylogenetic analysis, the putative strains of *Dothichiza pithyophila* (dH 12609 and CBS 215.50) are segregated into 2 different subclades distant to each other; strain CBS 215.50 forms a clade close to *Sydowia polyspora* (CBS 162.9) in the family Dothideaceae and *Dothidea pithyophila* (HJ22-4, dH_12609) forms an independent lineage close to *Pseudoydowia eucalypti* (CPC 14927, CBS 14028) in the family Aureobasidiaceae (data not shown). We therefore, retain the genus *Dothichiza* in Dothideomycetes, genera *incertae sedis* until further confirmation.

Dothichiza populea Sacc. & Briard, in Saccardo, Syll. fung. (Abellini) 3: 672 (1884) Fig. 50

≡ *Chondroplea populea* (Sacc. & Briard) Kleb., Phytopath. Z. 6: 291 (1933)

Index Fungorum number: IF275050; Facesoffungi number: FoF 06235

Pathogenic on various substrates of a range of host plants. Sexual morph: Undetermined. Asexual morph: *Conidiomata* 254–744 µm high × 874–1063 µm diam ($\bar{x}$ = 433.8 × 972.8 µm, n = 10), numerous in the bark, stromatic, initially in pustules covered by the epidermis of the host, rupturing at the apex when mature, immersed to sub-peridermal, solitary, multilocular and convoluted, often irregular in shape, dark brown to black, ostiolate. *Conidiomata wall* 11.2–26.6 µm with irregular surface at the base on the inside, outer layer composed of 2–3 layers of brown cells of *textura angularis*, inner layer composed of hyaline-walled cells of *textura angularis*. *Conidiophores* 4–6 µm × 1 µm ($\bar{x}$ = 5 × 1 µm, n = 10), hyaline, branched at the base, septate, smooth, hyaline. *Conidiogenous cells* enteroblastic, phialidic, cylindrical, indeterminate, integrated or discrete, hyaline, smooth. *Conidia* 2–3 µm × 1–2 µm ($\bar{x}$ = 3.6 × 2.1 µm, n = 10), subglobose to ovoid, or rarely ellipsoid, apex obtuse, base truncate or rounded, aseptate, creamy to tanny olive or pale brown, median guttulate, thick and smooth-walled.

Material examined – USA, New York, Dutchess, Poughkeepsie, on *Populus nigra* (Salicaceae), 25 May 1923, Unknown collector (CUP 012269).

Economic significance –The genus *Dothichiza* is parasitic and responsible for outbreaks of cankers in many hosts. There is evidence that damage caused from members of the genus *Dothichiza* is European in origin. Trees under stress are most frequently infected by this taxon and show discoloration of the bark in the cankers (Hedgcock & Hunt 1916, Phillips & Burdekin 1992).

Dothivalsaria Petr., Sydowia 19(1-6): 283 (1966)

Saprobic on dead branches. Sexual morph: *Stromata* pseudostromatic, immersed or semi-immersed from bark on wood, scattered or gregarious, appearing on the host surface as dark brown to black, smooth, hollow, circular dots. *Ascomata* subglobose to globose, carbonaceaous, black, solitary, scattered throughout the host, papillate. *Peridium* composed of pale brown compressed cells of *textura angularis*. *Ostiole* inconspicuous at the surface, fragile, shiny. *Paraphyses* numerous, sparsely branched, hyaline, septate, filamentous, cylindrical, at times irregular, apically free. *Asci* cylindrical, bitunicate, fissitunicate, 8-spored, apex thin, no ring visible in Congo red. *Ascospores* uniseriate, ellipsoidal, 1-septate, dark brown, slightly constricted at the septum, surface finely warted or reticulate with the ends broadly rounded. Asexual morph: Undetermined.

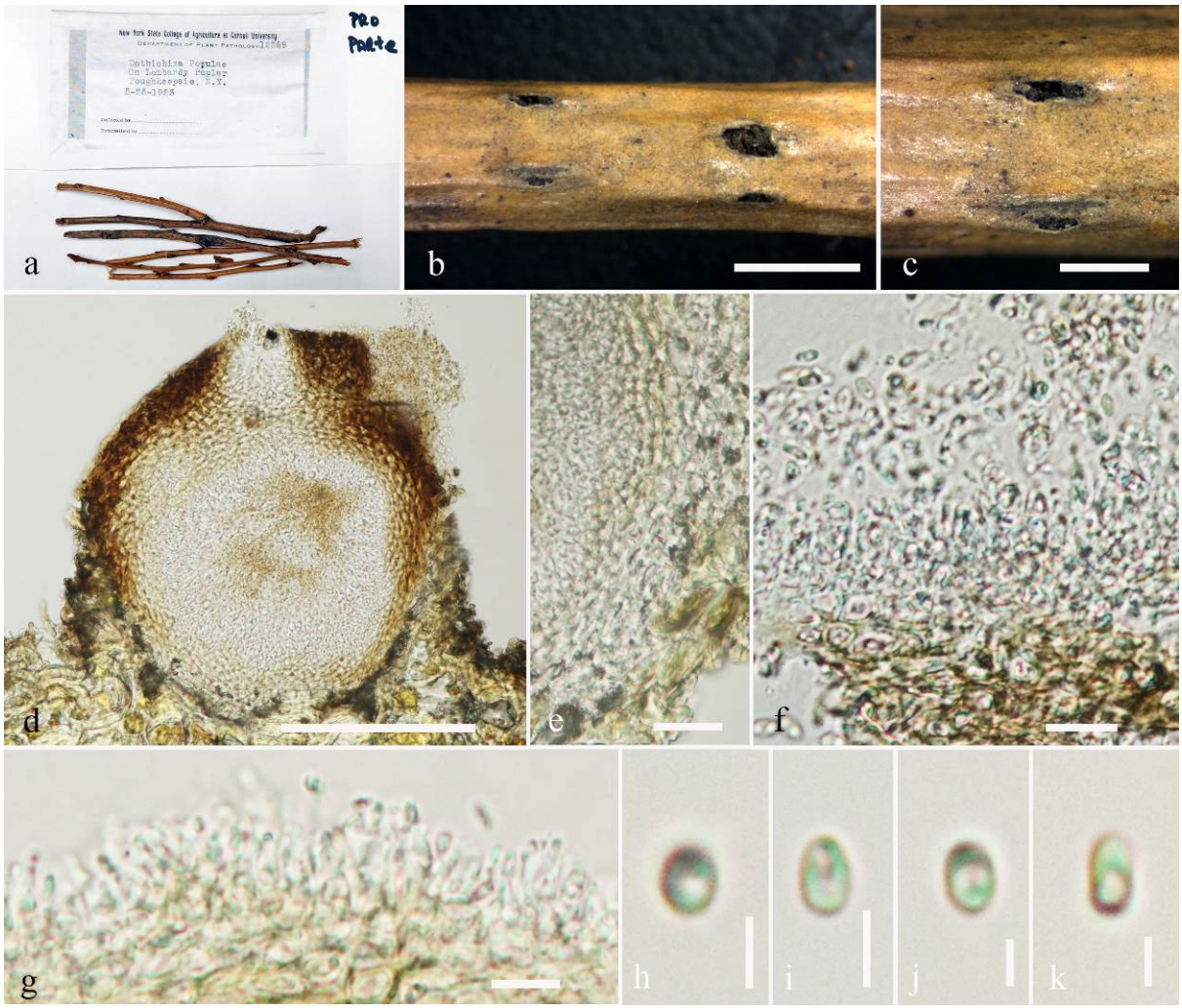

Figure 50 – *Dothichiza populea* (CUP 012269). a Details of herbarium material. b, c Habit and appearance of conidiomata on host surface. d Section of conidioma. e Peridium. f, g Conidiogenesis. h–k Conidia. Scale bars: b = 2 mm, c = 1 mm, d = 100 µm, e = 20 µm, f, g = 10 µm, h–k = 2 µm.

Type species – *Dothivalsaria megalospora* (Auersw.) Petr.

Notes – The monotypic genus *Dothivalsaria* was introduced by Petrak (1965) based on *D. megalospora*. The genus is characterized by immersed, average to large sized ascomata which usually aggregate under blackened stromatic tissues and have trabeculate pseudoparaphyses. Asci are cylindrical. Ascospores are brown, ellipsoid, 1-septate and uniseriate in the asci (Barr 1990). The ascostroma of *D. megalospora* is similar to those of *Aglaospora profusa* (Barr 1990), but their relationships are unclear. The genus was previously placed in Massariaceae by Lumbsch & Huhndorf (2010). However, later it was accepted as a genus in *Dothideomycetes*, genera *incertae sedis* (Wijayawardene et al. 2014, 2018). The asexual morph of this genus is unknown. We examined a specimen of *Dothivalsaria* under the code NY 02977713 but could not find an appropriate placement. The genus *Dothivalsaria* is therefore retained in Dothideomycetes, genera *incertae sedis*.

Dothivalsaria megalospora (Auersw.) Petr., Sydowia 19(1-6): 283 (1966) [1965] Fig. 51

≡ *Valsaria megalospora* Auersw., Leipzig. Bot. Tauschver. 5. (1866)

Index Fungorum number: IF 330180; Facesoffungi number: FoF 06237

Current name: *Massariovalsa megalospora* (Auersw.) E. Müll., in Müller & von Arx 1962

Figure 51 – *Dothivalsaria megalospora* (NY 02977713). a, b Details of herbarium material. d–f Habit and appearance of ectostromata on host surface. g Vertical section of stroma. h Peridium. i Apically free paraphyses. j–l Asci. m–o Ascospores. Scale bars: d, f = 1 mm, e = 2 mm, g = 400 µm, h, m–o = 20 µm, i = 10 µm, j–l = 100 µm.

Saprobic on unidentified dried branches. Sexual morph: *Stromata* pseudostromatic, immersed or semi-immersed from bark on wood, scattered or gregarious, appearing on the host surface as dark brown to black, smooth, hollow, circular dots. *Ascomata Ascomata* 850–1030 µm high × 810 µm–1040 µm diam. ($\bar{x}$ = 950 × 910 µm, n = 10), subglobose to globose, carbonaceous, black, solitary, scattered throughout the host, papillate. *Peridium* 25–40 µm thick composed of pale brown compressed cells of *textura angularis*. *Ostiole* 200–215 µm × 50–68 µm ($\bar{x}$ = 212.4 × 65.1 µm, n = 10), inconspicuous at the surface, fragile, shiny. *Paraphyses* numerous, sparsely branched, hyaline, septate, filamentous, cylindrical, at times irregular, apically free, 2–6 µm wide. *Asci* 114.4–120.8 µm × 4.9–6.5 µm ($\bar{x}$ = 117.6 × 5.7 µm, n = 10) cylindrical, bitunicate, fissitunicate, 8-spored, apex thin, no ring visible in Congo Red. *Ascospores* 31.5–34.1 µm × 10.5–10.7 µm ($\bar{x}$ = 32.8 × 10.6 µm, n = 10), uniseriate, ellipsoidal, 1-septate, dark brown, slightly constricted at the septum, surface finely warted or reticulate with the ends broadly rounded. Asexual morph: Undetermined.

Material examined – NORTH AMERICA, United States, Johnson, Vermont, on unidentified dried branches, 21 May 1995, A. J. Grout (NY 02977713).

Economic significance – None is reported.

Excipulariopsis P.M. Kirk & Spooner, in Spooner & Kirk, Trans. Br. mycol. Soc. 78(2): 251 (1982)

Saprobic on decayed wood with *corticeaceous* fungus. Sexual morph: formerly known in *Kentingia*. Asexual morph: *Mycelium* mostly immersed. *Conidiomata* superficial, pulvinate, dark-brown to black, setiferous, with basal aggregation of thick-walled, dark brown cells. *Setae* straight or flexuous, peripheral, arising directly from cells of the basal stroma, subulate, dark brown, septate, thick-walled, smooth, with a pointed apex. *Conidiophores* micronematous, short, cylindrical, pale-brown, unbranched. *Conidiogeneous cells* holoblastic, monoblastic, integrated, terminal, and determinate. *Conidia* acrogenous, solitary, dry, broadly fusoid, truncate at the base, multiseptate, thick and smooth-walled, dark-brown, with hyaline to very pale brown terminal cells.

Type species – *Excipulariopsis narsapurensis* (Subram.) Spooner & P.M. Kirk

Notes – *Excipulariopsis* was introduced by Spooner & Kirk (1982) for *Excipularia narsapurensis* found on decayed wood in the USA. Subsequently, Ellis (1976) presented an expanded generic description and illustrated *E. narsapurensis* Subram., found on unidentified wood and bark in India (Subramanian 1971). This species, rather than the holotype, was used by both Barnett & Hunter (1972) and Carmichael et al. (1980) to illustrate the genus. The major morphological characters of the genus are the non-falcate, thick-walled, septate conidia and consistently thick-walled, dark brown, subulate setae at the periphery of a non-cupulate conidioma arising directly from the basal stroma. The sexual morph was formerly known in *Kentingia*. Unfortunately, the taxonomic position of *Excipulariopsis* remains unresolved as cultures and sequences are unavailable. The genus *Excipulariopsis* in retained in Dothideomycetes genera *incertae sedis*.

Excipulariopsis narsapurensis (Subram.) Spooner & P.M. Kirk, Trans. Br. mycol. Soc. 78(2): 251 (1982) Fig. 52

≡ *Excipularia narsapurensis* Subram., J. Indian bot. Soc. 35(1): 56 (1956)

Index Fungorum number: IF110673; Facesoffungi number: FoF 06242

Saprobic on decayed wood with corticeaceous fungus. Sexual morph: Undetermined. Asexual morph: *Mycelium* mostly immersed. *Conidiomata* 46–91 µm high × 78–90 µm diam., ($\bar{x}$ = 71.9 × 82.7 µm, n = 10), superficial, pulvinate, setiferous, dark-brown to black with a basal aggregation of thick-walled, dark brown cells. *Setae* straight or flexuous, peripheral, arising directly from cells of the basal stroma, subulate, reddish brown to dark brown, septate, thick-walled, smooth, pointed at apex. *Conidiophores* micronematous, short, cylindrical, pale-brown, unbranched. *Conidiogeneous cells* holoblastic, monoblastic, integrated, terminal, and determinate. *Conidia* 68–72 µm × 23–27 µm ($\bar{x}$ = 70.5 × 26.7 µm, n = 10), acrogenous, solitary, dry, broadly

fusoid, truncate at the base, multiseptate,dark-brown, with hyaline to very pale brown terminal cells, thick and smooth-walled.

Material examined – USA, Hawaii, Molokai, Kau, Mt. House trip, on decayed wood with *corticeaceous* fungus, 9 June 1952, M.L. Lohman s.n. (BISH 594584).

Economic significance – The genus *Excipulariopsis* seems to be both saprobic and pathogenic as it has also been reported in *Cocos nucifera* L in India (Dubey & Pandey 2019).

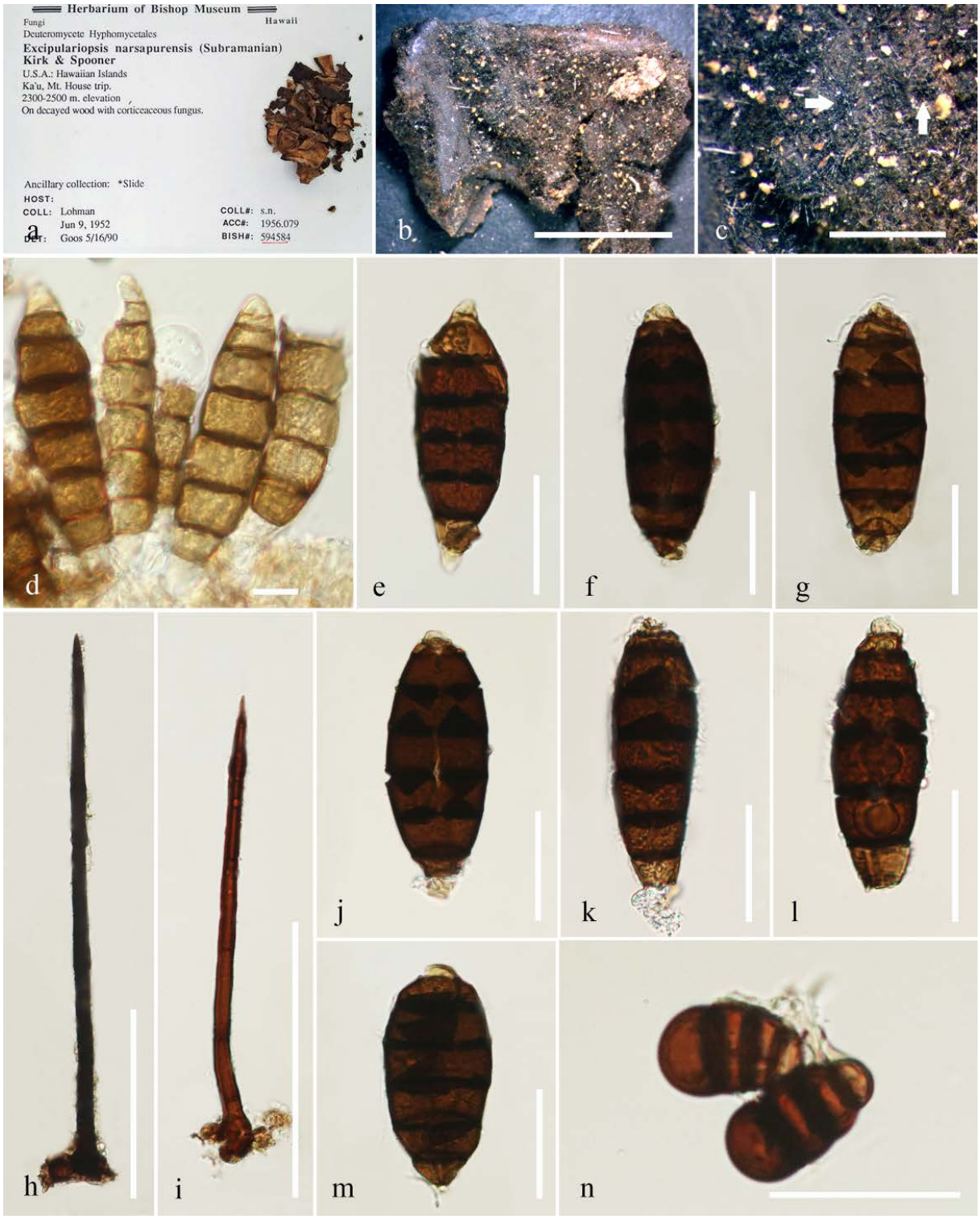

Figure 52 – *Excipulariopsis narsapurensis* (BISH 594584) a, b Herbarium material. c Appearance of conidiomata on host surface. d Conidiogenesis. h, i Setae. j–n Conidia. Scalebar: b = 2 mm, c = 1 mm, d = 10 µm, e, f, j–n = 30 µm, h, i = 100 µm.

Gilletiella Sacc. & P. Syd., Syll. fung. (Abellini) 14(2): 691 (1899)

Foliicolous in undergrowth of *Chusquea serrulata*. *Thallus* crustose, thick, ecorticate. Sexual morph: *Ascomata* small, solitary or scattered, concentrically arranged, covered by the algal layer, lenticular to conical, rounded or outwardly elongate, dark brown to black, top rounded, with dark brown, conical involucrellum below the algal layer and dark brown, membranous involucrum (peridium) surrounding the subglobose nucleus, without apparent ostiole. *Peridium* thin, single layered composed of brown, septate hyphae relatively conglutinated into textura epidermoidea to intricata. *Hamathecium* gelatinous. *Pseudoparaphyses* lacking. *Asci* 8-spored, bitunicate, fissitunicate, obclavate, without a distinct ocular chamber. *Ascospores* 2–3-seriate irregularly arranged in asci, fusiform, pale grayish, 1-septate to submuriform, smooth-walled, ends rounded, without endospore, without perispore. Asexual morph: Undertermined.

Type species – *Gilletiella chusqueae* (Pat.) Sacc. & P. Syd.

Notes – The monotypic genus *Gilletiella* was introduced by Patouillard & Lagerheim (1899) based on the type species *G. chusqueae*, which was found on matrix of *Chusquea serrulata* from Ecuador. Saccardo & Sydow (1899) redescribed the genus. The genus is characterized by a hypostromatic perithecia, 8-spored bitunicate asci, 3-septate pale grayish ascospores. The asexual morph of the genus is coelomycetous (ascochyta-like). *Gilletiella* was compared to *Micropeltis* in having similar stromata and *Polystomella* with respect to the ascospores (Patouillard & Lagerheim 1899). The species lack sequence data. We therefore, retain the genus in Dothideomycetes, genera *incertae sedis*.

Gilletiella chusqueae (Pat.) Sacc. & P. Syd., Syll. fung. (Abellini) 14(2): 691 (1899) Fig. 53

≡ *Heterochlamys chusqueae* Pat., in Patouillard & Lagerheim 1895

Index Fungorum number: IF 223231; Facesoffungi number: FoF 06244

Foliicolous in undergrowth of *Chusquea serrulata*. *Thallus* crustose, thick, ecorticate. Sexual morph: *Ascomata* 0.1–0.2 mm diam., solitary or scattered, concentrically arranged, covered by the algal layer, lenticular to conical, rounded or outwardly elongate, dark brown to black, top rounded, with dark brown, conical involucrellum below the algal layer and dark brown, membranous involucrum (peridium) surrounding the subglobose nucleus, without apparent ostiole. *Peridium* 32–38 μm thin, single layered composed of brown, septate hyphae relatively conglutinated into textura epidermoidea to intricata. *Hamathecium* gelatinous, lacking pseudoparaphyses. *Asci* 52–54 μm × 11.4–11.5 μm ($\overline{x}$ = 53.2 × 11.5 μm, n = 10), 8-spored, bitunicate, fissitunicate, obclavate, without a distinct ocular chamber. *Ascospores* 14.8–15.0 μm × 4.7–4.9 μm ($\overline{x}$ = 14.9 × 4.9 μm, n = 10), 2–3-seriate irregularly arranged in asci, fusiform, 1-septate to submuriform, ends rounded, without endospore, without perispore, pale grayish, smooth-walled. Asexual morph: Undertermined.

Material examined – ECUADOR, Tungurahua, on matrix of *Chusquea serrulata* (Poaceae), 20 December 1937, H. Sydow (S-F46336).

Economic significance – None is reported.

Harknessiella Sacc., Syll. fung. (Abellini) 8: 845 (1889)

Saprobic on lower surface of leaves. Sexual morph: *Ascomata* scattered, solitary, superficial, and globose to subglobose, easily removable from the host surface, with setae, glabrous, ostiolate at centre, with minute papilla internally lined with short, brown, aseptate periphyses. *Peridium* thin-walled, of equal thickness, composed of several layers of small, flattened, brown to dark brown cells of *textura angularis*. *Hamathecium* composed of dense, broad filamentous, distinctly septate, anastomosed pseudoparaphyses, trabeculate, embedded in a hyaline gelatinous matrix. *Asci* 8-spored, bitunicate, fissitunicate, fusiform to ellipsoidal, cylindrical to cylindric-clavate, short pedicellate, apically rounded, with an ocular chamber. *Ascospores* overlapping 1–2-seriate, hyaline, with rounded ends, 3-septate, slightly constricted at the central septum, smooth-walled. Asexual morph: *Pycnidia* hypophyllous, dark brown to black, superficial, sparsely scattered or sporadically distributed on surface of leaves, easily removable from the host substrate. *Conidiophores* straight or slightly curved, hyaline, reduced to conidiogenous cells. *Conidiogenous cells* holoblastic,

percurrent, cylindrical to elliptical, septate, rough and thick-walled. *Conidia* 2–3 septate, ellipsoidal to cylindrical, hyaline to olivaceous-green, smooth-walled.

Type species – *Harknessiella purpurea* (W. Phillips & Harkn.) Sacc.

Notes – The genus *Harknessiella* was introduced by Saccardo (1889) with *Harknessiella purpurea* as the type species. The latter was also found on lower surface of leaves of *Garrya elliptica*. The genus is characterized by globose to subglobose, superficial ascomata, consisting of dark-brown setae, cylindrical to cylindric-clavate asci and fusiform to ellipsoidal ascospores. We re-examined a specimen of *Harknessiella purpurea* under the code C0170081F from F herbarium. It seems that the genus *Harknessiella* shares similar characters with the genus *Aphanostigme* in Phaeosphaeriaceae (Boonmee et al. 2017). However, we retain the genus *Harknessiella* to Dothideomycetes, genera *incertae sedis* until fresh collections are available for further molecular studies.

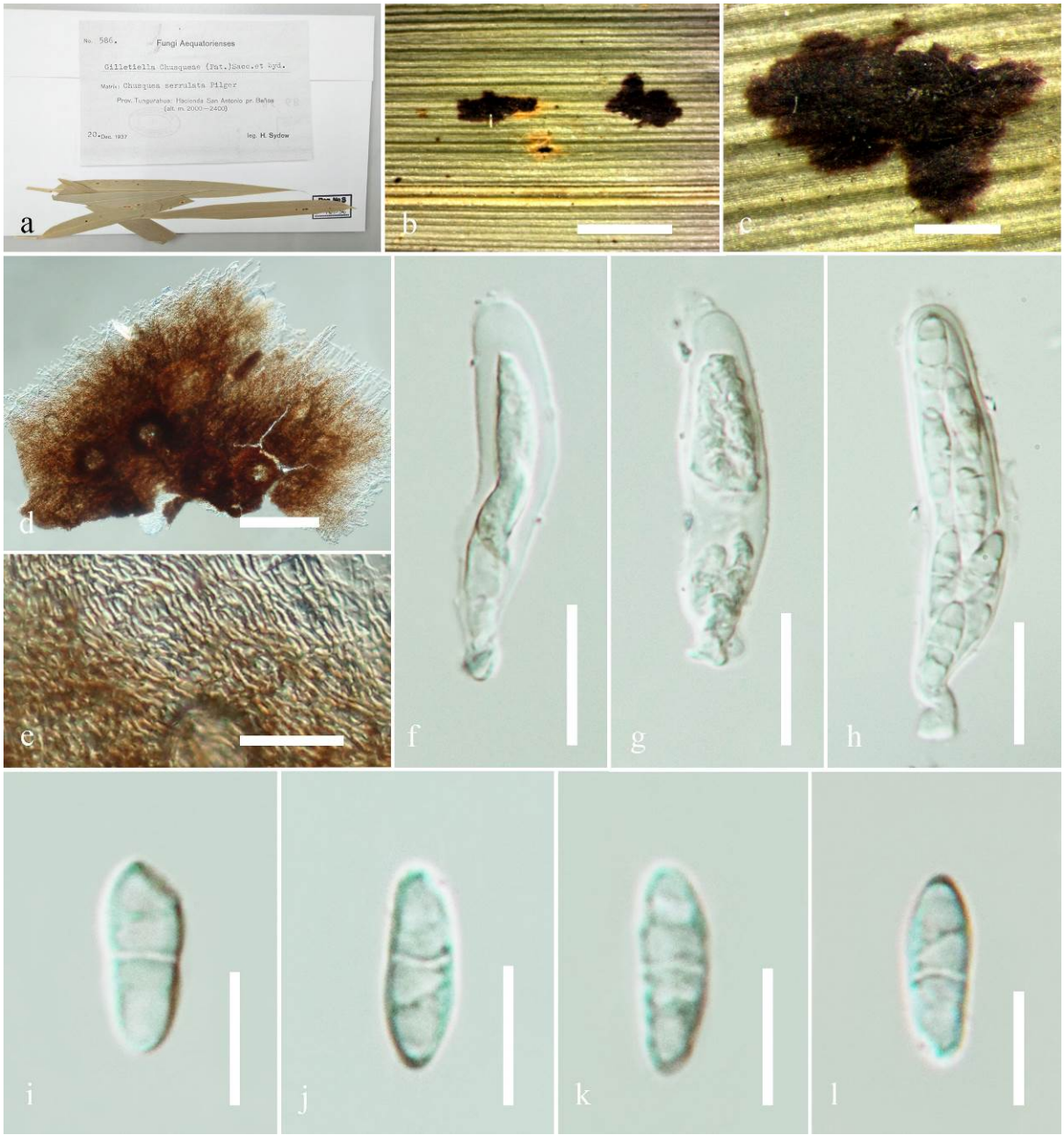

Figure 53 – *Gilletiella chusqueae* (S-F46336). a Details of herbarium material. b, c Habit and appearance of ectostromata on host surface. d Squash mount of ascoma. e Peridium. f–h Asci. i–l Ascospores. Scale bars: b = 2 mm, c = 500 µm, d = 200 µm, e = 30 µm, f–h = 20 µm, i–l = 10 µm.

Harknessiella purpurea (W. Phillips & Harkn.) Sacc., Syll. fung. (Abellini) 8: 845 (1889) Fig. 54

≡ *Phillipsiella purpurea* W. Phillips & Harkn., Bull. Calif. Acad. Sci. 1(no. 1): 23

Index Fungorum number: IF147107; Facesoffungi number: FoF 06245

Saprobic on lower surface of *Garrya elliptica* leaves. Sexual morph: *Ascomata* 315–417 µm high, × 479–542 µm diam., scattered, solitary, superficial, globose to subglobose, easily removable from the host surface, consist of setae, glabrous, ostiolate at centre, with minute papilla lined with short, brown, aseptate periphyses. *Peridium* 18–28 µm wide, thin-walled, of equal thickness, composed of several layers of small, flattened, brown to dark brown cells of *textura angularis*. *Hamathecium* 3–4 µm wide composed of dense, 2–3 µm wide, broad filamentous, distinctly septate, anastomosed pseudoparaphyses, embedded in a hyaline gelatinous matrix. *Asci* 79–103 µm × 9–11 µm ($\overline{x}$ = 92.6 × 9.1 µm, n = 10), 8-spored, bitunicate, fissitunicate, cylindrical to cylindric-clavate, short pedicellate, apically rounded, with an ocular chamber. *Ascospores* 17–21 µm × 3–4 µm ($\overline{x}$ = 19.6 × 3.9 µm, n = 10), overlapping 1–2-seriate, hyaline, fusiform with rounded ends, 3-septate, slightly constricted at the central septum, smooth-walled. Asexual morph: *Pycnidia* 302–358 µm × 485–502 µm ($\overline{x}$ = 311.6 × 499.5 µm, n = 10), hypophyllous, dark brown to black, superficial sparsely scattered or sporadically distributed on surface of leaves, easily removable from the host substrate. *Conidiophores* straight or slightly curved, hyaline, reduced to conidiogenous cells. *Conidiogenous cells* holoblastic, percurrent, cylindrical to elliptical, septate, rough and thick-walled. *Conidia* 10–14 µm × 2–3 µm ($\overline{x}$ = 12.8 × 2.6 µm, n = 10), hyaline to olivaceous-green, 2–3 septate, ellipsoidal to cylindrical, smooth-walled.

Material examined – USA, California, near Tamalpais, on lower surface of leaf of *Garrya elliptica* (Garryaceae), 8 July 1913, J.J Davis (C0170081F).

Economic significance – The genus *Harknessiella* causes yellow leaf spots on leaves of hosts (Saccardo 1889).

Hypobryon Döbbeler, Nova Hedwigia 37(1): 3 (1983)

Saprobic on lower leaflets of *Porella* sp. Sexual morph: *Ascomata* globose to subglobose, black, scattered or in a group, superficial, carbonaceous, papillate. *Peridium* membranous composed of 2 layers of cells, the inner layer consisting of brown cells of *textura angularis* with the outer layer consisting of thicker dark-brown cells of *textura globulosa*. *Hamathecium* composed of dense, hyaline, pseudoparaphyses surrounding the asci. *Asci* not observed. *Hymenium* at the base is gelatinous. *Ascospores* ellipsoid, 4-celled, hyaline at first becoming pale brown at maturity, straight or slightly curved often slightly constricted. Asexual morph: Undetermined.

Type species – *Hypobryon poeltii* (Döbbeler) Döbbeler

Notes – The genus *Hypobryon* is a remarkable bryophilic genus characterized by hypophyllous ascomata which perforate the moss leaf to release ascospores on the upper surface. A combination of appressoria and intraparietal haustoria can be seen in this genus (Döbbeler 1983). The type species *Hypobryon poeltii* was found on *Porella* sp. (Porellaceae). Currently, seven species are accommodated in the genus *Hypobryon*. The asexual morph is unknown. Cultures and sequences are unavailable. We examined the holotype specimen of *Hypobryon poeltii* from GZU herbarium but could not observe all the morphological characters. Thus, we retain *Hypobryon* in Dothideomycetes genera *incertae sedis*. Fresh specimen with asexual morph link and sequence data would be required to provide exact placement for this genus.

Hypobryon poeltii (Döbbeler) Döbbeler, Nova Hedwigia 37(1): 12 (1983) Fig. 55–57

≡ *Punctillum poeltii* Döbbeler, Mitt. bot. StSamml., Münch. 14: 203 (1978)

Index Fungorum number: IF322097; Facesoffungi number: FoF 06249

Saprobic on lower leaflets of *Porella* sp. Sexual morph: *Ascomata* 65–101 µm high × 55–99 µm diam., ($\overline{x}$ = 76.9 × 83.8 µm, n = 20), globose to subglobose, black, scattered or in a group, superficial, carbonaceous, papillate. *Peridium* membranous, composed of 2 layers of cells, with the inner layer consisting of brown cells of *textura angularis* with the outer layer consisting of thicker

dark-brown cells of *textura globulosa*. *Hamathecium* composed of dense, hyaline, pseudoparaphyses surrounding the asci. *Asci* not observed. *Hymenium* at the base is gelatinous. *Ascospores* 15–19 µm × 4–6 µm ($\overline{x}$ = 17.2 × 5.5 µm, n = 20), ellipsoid, 2-3 septate, hyaline at first becoming pale brown at maturity, straight or slightly curved often slightly constricted. Asexual morph: Undetermined.

Material examined – AUSTRIA, Styria, surroundings of Graz: slopes between Stift Rein and Pleschwirt (Kehrerbach-Tal), northwestl, near Graz, on *Porella* sp (Porellaceae), 14 April 1974, P. Döbbeler s.d. (GZU 000291902, holotype).

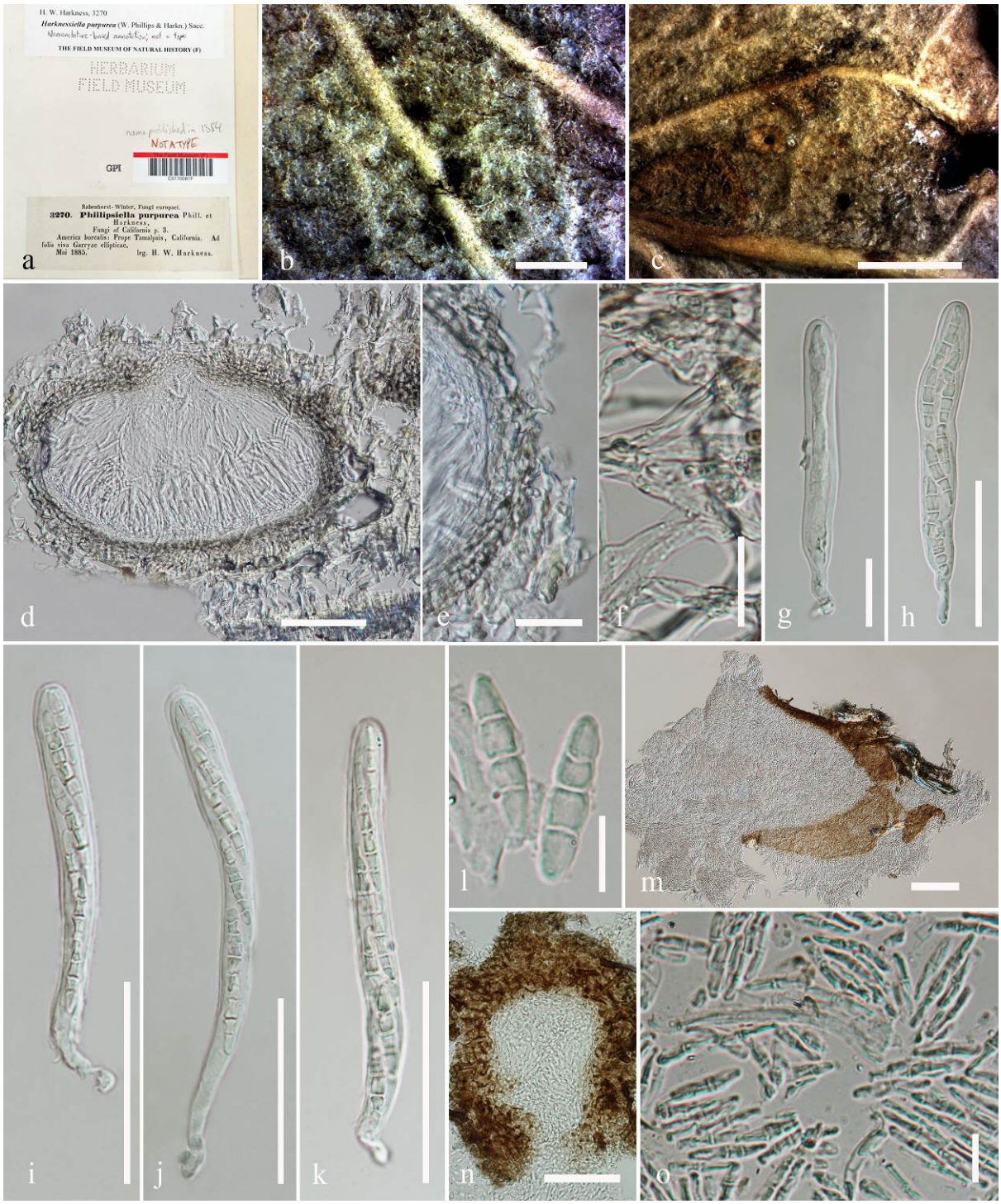

Figure 54 – *Harknessiella purpurea* (C0170081F). a Details of herbarium material. b, c Host and close up ascoma on host. d Section through an ascoma. e Peridium. f Hamathecium. g–k Asci. l

Ascospores. m, n Conidiomata. o. Conidia. Scale bars: b = 500 µm, c = 1 mm, d = 200 µm, e, m = 100 µm, f, l, o = 10 µm, g = 20 µm, h–k, n = 50 µm.

Economic significance – Species of *Hypobryon* are bryophilous or grow on mosses (Döbbeler 1997).

Notes – We could not observe the asci of *Hypobryon poeltii* as the specimen was dry. The original author described the asci as 'measuring about 25–35 µm × 12–21 µm, cylindrical at first becoming widely ellipsoidal or ovoid, 4-spored'.

Figure 55 – *Punctillum poeltii* (GZU 000291902, holotype). a, b Details of herbarium material. c, d Habit and appearance of ascomata on host surface e Vertical section of ascomata. f Peridium. g Squash mount of ascoma. h–j Ascospores. Scale bars: c = 2 mm, d = 500 µm, e, g = 50 µm, f = 20 µm, h–j = 10 µm.

Lignosphaeria Boonmee, Thambug. & K.D. Hyde, in Thambugala et al., Fungal Diversity: 10.1007/s13225-015-0348-3, [61] (2015)

Saprobic on dead wood. Sexual morph: *Ascomata* scattered to gregarious, superficial or semi-immersed to densely erumpent, carbonaceous, dark brown to black, globose to subglobose. *Ostiole* slit-like, central, papillate, periphysate. *Peridium* broad at the apex, comprising several layers of dark brown to black cells of textura angularis, fusing at the outside with the host tissues.

Hamathecium 1–3 μm of septate, long, hyaline, anastomosing and branched, cellular pseudoparaphyses, embedded in gel matrix between and above the asci. *Asci* 8-spored, bitunicate, cylindrical to clavate, long pedicellate, apically rounded, with a minute ocular chamber. *Ascospores* uni to bi-seriate, hyaline, cylindrical to fusiform, with narrowly rounded ends, wide at the second cell from the apex, 3-septate, constricted at the septa, cell above central septum widest, small guttulate, smooth-walled, lacking a mucilaginous sheath. Asexual morph: Undetermined.

Type species – *Lignosphaeria thailandica* Boonmee, Thambugala & K.D. Hyde

Notes – The genus *Lignosphaeria* was introduced by Boonmee et al. (2015) with *Lignosphaeria thailandica* as the type species. *Lignosphaeria* was compared with *Thyridaria* (Hyde et al. 2013) in having immersed to erumpent ascomata, pseudoparaphyses and cylindrical to fusiform ascospores with narrowly rounded or acute ends. In a phylogenetic analyses carried out by Thambugala et al. (2015), the genus *Lignosphaeria* formed a clade in between Floricolaceae and Amorosiaceae basal to the genus *Thyridaria*. In our analyses, the genus *Lignosphaeria* positions itself in between Floricolaceae and Lophiostomataceae as an independent lineage. It seems that a new family should be introduced for this genus however more sequences are required to confirm this hypothesis as only internal transcribed spacer (ITS) gene and 28S large ribosomal subunit RNA gene regions have been deposited in GenBank (Fig. 58). We therefore, retain the genus in the Dothideomycetes genera *incertae sedis*.

Lignosphaeria thailandica Boonmee, Thambug. & K.D. Hyde, in Thambugala et al., Fungal Diversity: 10.1007/s13225-015-0348-3, [62] (2015) Fig. 59

Index Fungorum number: IF551282; Facesoffungi number: FoF01089

Saprobic on dead wood. Sexual morph: *Ascomata* 385–470 μm high × 300–325 μm diam. ($\bar{x}$ = 355.2 × 301.2 μm, n = 3), scattered to gregarious, superficial or semi-immersed to densely erumpent, carbonaceous, dark brown to black, globose to subglobose. *Ostiole* slit-like, central, papillate, periphysate. *Peridium* 16–24 μm wide, broad at the apex, comprising several layers of dark brown to black cells of textura angularis, fusing at the outside with the host tissues. *Hamathecium* 1–3 μm wide, long, hyaline, anastomosing and branched, cellular pseudoparaphyses, embedded in gel matrix between and above the asci. *Asci* 53–81 × 6–8 μm ($\bar{x}$ = 72.9 × 7.2 μm, n = 10), 8-spored, bitunicate, cylindrical to clavate, long pedicellate, apically rounded, with a minute ocular chamber. *Ascospores* 15–18 × 3–5 μm ($\bar{x}$ = 16.7 × 3.3 μm, n = 10), uni to bi-seriate, hyaline, cylindrical to fusiform, with narrowly rounded ends, wide at the second cell from the apex, 3-septate, constricted at the septa, cell above central septum widest, small guttulate, smooth-walled, lacking a mucilaginous sheath. Asexual morph: Undetermined.

Material examined – THAILAND, Chiang Mai Province, Muang, Doi Su Thep, Huai Kok Ma, on dead wood, 21 April 2011, S. Boonmee, DST-04 (MFLU 11–0135, holotype)

Economic Significance – None is reported.

Limaciniopsis J.M. Mend., in Stevens, Bulletin of the Bernice P. Bishop Museum, Honolulu, Hawaii 19: 58 (1925)

Saprobic and *parasitic* on leaves of *Rollandia racemosa*. Sexual morph: *Mycelium* perisporioid, hyaline, filiform. *Ascomata* few, solitary, or in small groups, superficial, globular, amber-colored to dark brown, gelatinous, ostiolate, setae absent. *Peridium* thin, carbonaceous or membranaceous, 2–3-layered, composed of dark brown cells of textura angularis. *Hamathecium* of dense asci, lacking pseudoparaphyses. *Asci* 8-spored, bitunicate, fissitunicate, broadly clavate, with a short pedicel. *Ascospores* oblong to ellipsoid, hyaline when young, turning reddish brown at maturity, 4-celled, slightly constricted at the septum with two end cells hyaline. Asexual morph: Undetermined.

Type species – *Limaciniopsis rollandiae* J.M. Mend.

Notes – Mendoza (1925) described the genus *Limaciniopsis* amongst the Capnodiaceae for the single species found related with a blue-green alga on leaves of *Rollandia racemosa* in Oahu, Hawaii.

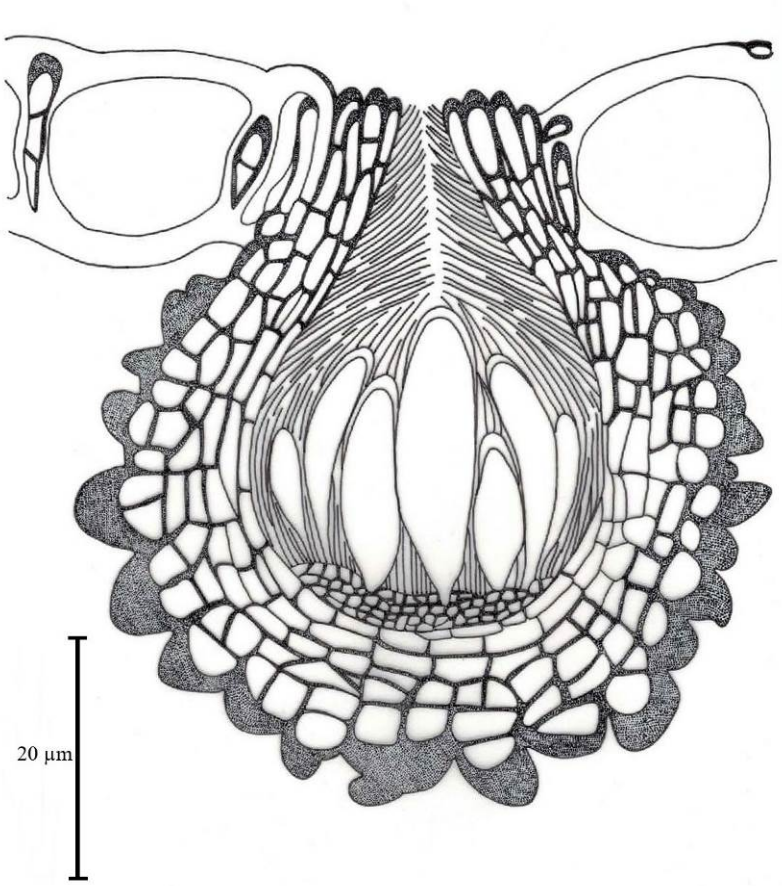

Figure 56 – Ascoma of *Punctillum poeltii* (holotype); redrawn from Döbbeler (1978).

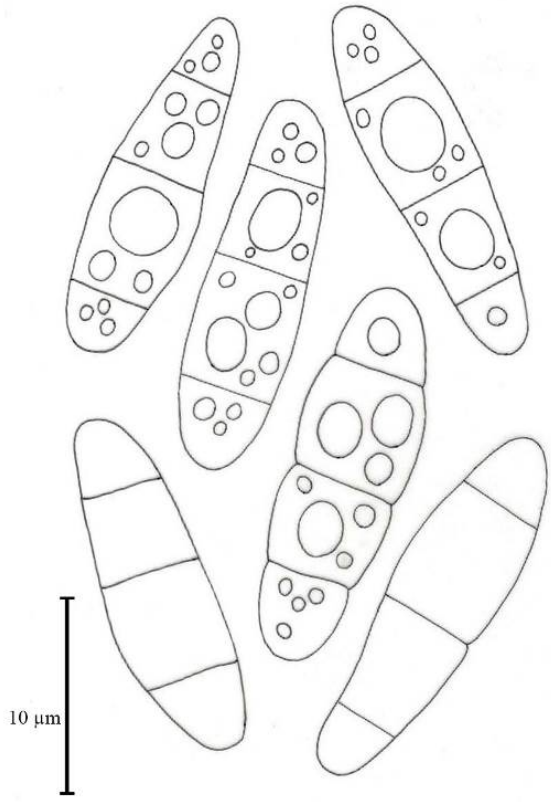

Figure 57 – Ascospores of *Punctillum poeltii* (holotype); redrawn from Döbbeler (1978).

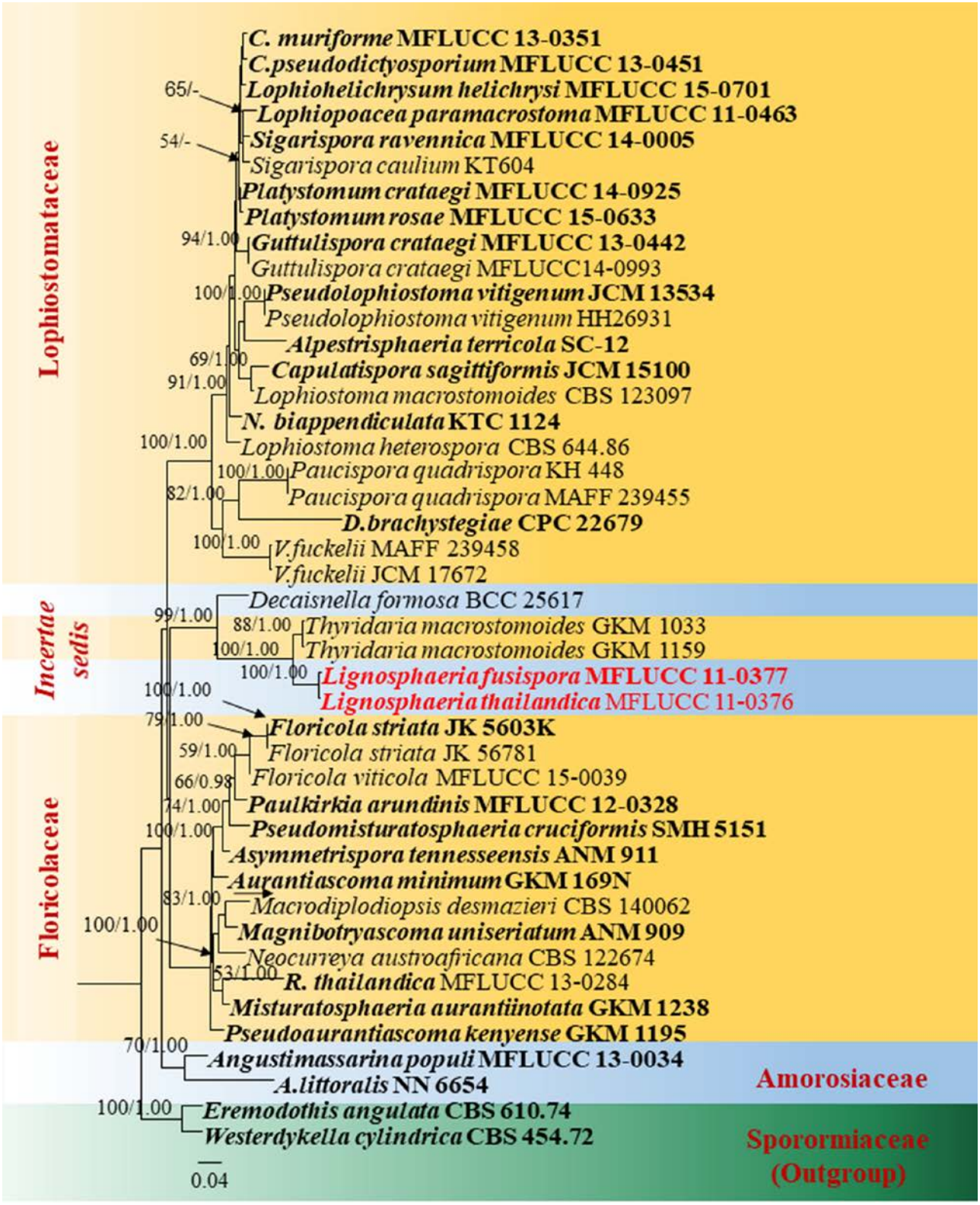

Figure 58 – Phylogram generated from maximum likelihood analysis based on LSU and ITS sequence data retrieved from the GenBank. Related sequences were referred to Liu et al. (2017) and Thambugala et al. (2017). Forty-four taxa are included in the genes sequence analyses which comprise total 2229 characters after alignment. *Eremodothis angulata* (CBS 610.74) and *Westerdykella cylindrica* (CBS 454.72) are used as the out-group taxa. Maximum likelihood (ML) analysis was conducted in the CIPRES Science Gateway V. 3.3. The best sorting RaXML tree with a final likelihood value of -9834.122464 is presented. Estimated base frequencies were as follows: A = 0.252590, C = 0.229863, G = 0.288440, T = 0.229108; substitution rates AC = 1.924217, AG

= 2.620898, AT= 2.094050, CG = 1.166547, CT = 10.037969, GT = 1.000000; gamma distribution shape parameter α = 0.504667; proportion of invariant 0.393490. ML bootstrap values ≥ 50% are given as the first set of numbers and approximate likelihood-ratio test (aLRT) ≥ 0.90 values as the second set of numbers above the nodes. Voucher/strain numbers are given after the taxon names, the one from type material are indicated in bold face. Sequence of interest is indicated in red. The bar length indicates the number of nucleotide substitutions per site.

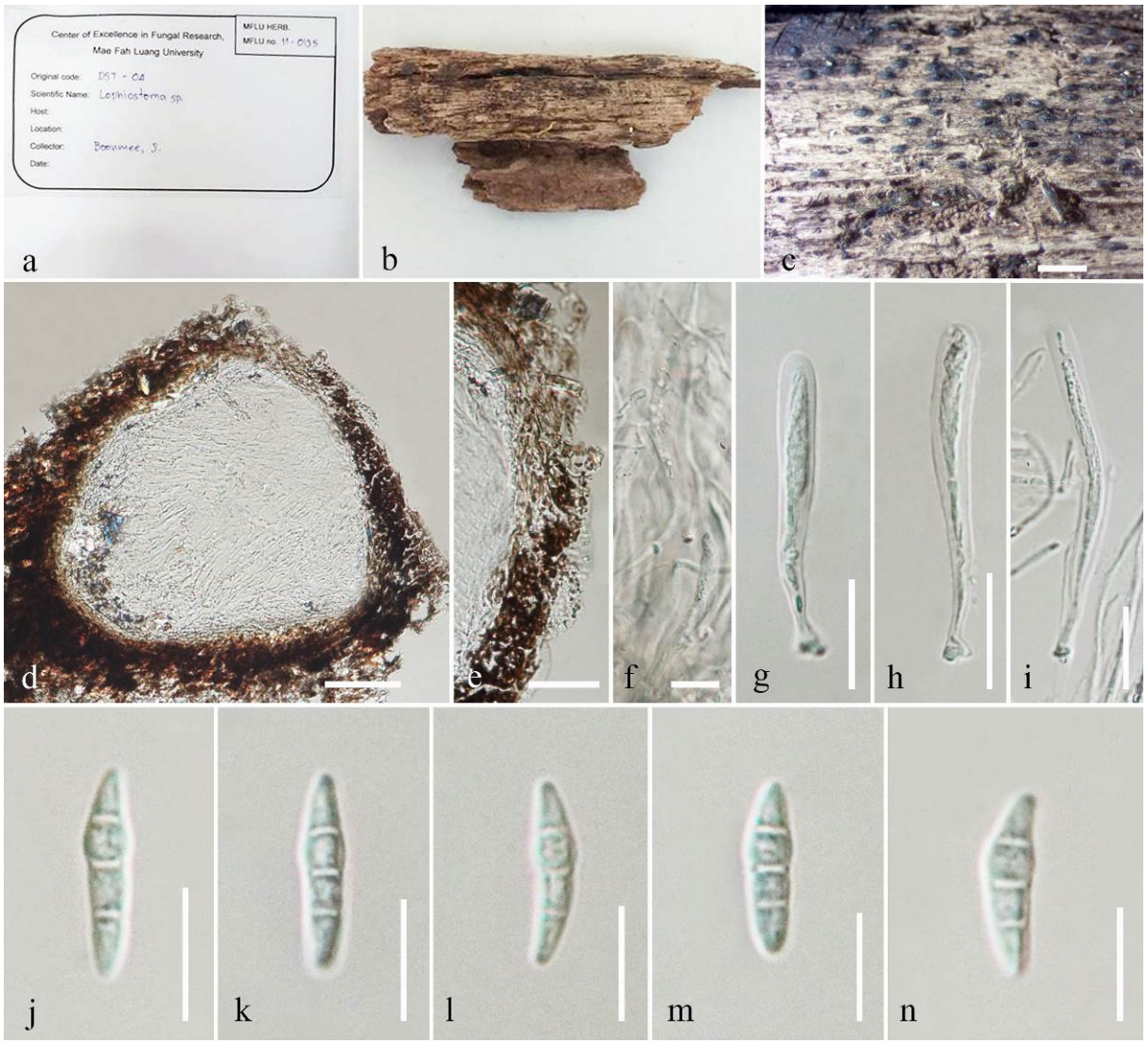

Figure 59 – *Lignosphaeria thailandica* (MFLU 11–0135, holotype). a, b Details of herbarium material. c Habit and appearance of ascomata on host surface. d Section of ascoma. e Peridium. f Hamathecium. g–i Asci. j–n Ascospores. Scale bars: c = 1 mm, d = 50 µm, e, g–i = 20 µm, f = 5 µm, j–n = 10 µm.

Batista & Vital (1957) reported that the species was a pyrenomycete and was parasitic on the mycelium of *Sporoschisma* sp. Batista and Vital (1957) described the asci as unitunicate in their illustrated account which matches that of Mendoza reasonably well. We could not observe the asci in the specimen that we examined. However, Batista & Ciferri (1963) referred to *Limaciniopsis* as a synonym of *Phragmocapnias* Theiss. & Syd. (q.v.), and consequently *Limaciniopsis rollandiae* was referred as a synonym of *Phragmocapnias callitris* (McAlpine) Cif. & Bat. (= *Capnodium callitris* McAlp. = *Capnodium salicinum* Mont. fide Fraser, 1935b). The asci of *Phragmocapnias callitris* were defined as bitunicate by Batista & Ciferri (1963) but no reference was made to '*Sporoschisma*' which accompanies *Limaciniopsis rollandiae*. On other hand, *Limaciniopsis* was cited as a

synonym of *Capnodium* by Von Arx & Muller (1975). We examined the type collection from BISH under the code BISH 499971. Unfortunately, we could not observe the asci as the specimen was in poor condition. However, it is clear that the genus is characterized by oblong to ellipsoidal, reddish brown ascospores. The genus *Limaciniopsis* is retained in *Dothideomycetes*, genera *incertae sedis* until fresh collections and molecular data are obtained.

Limaciniopsis rollandiae J.M. Mend., in Stevens, Bulletin of the Bernice P. Bishop Museum, Honolulu, Hawaii 19: 58 (1925) Fig. 60

Index Fungorum number: IF 276675; Facesoffungi number: FoF 06250

Saprobic and *parasitic* on leaves of *Rollandia racemosa*. Sexual morph: *Mycelium* perisporioid, hyaline, filiform. *Ascomata* 46–59 µm × 60–83 µm ($\bar{x}$ = 61.6 × 70 µm, n = 10), solitary, or in small groups, superficial, globular, amber-colored to dark brown, gelatinous, ostiolate, setae absent. *Peridium* 20.9–25.6 µm, thin, carbonaceous or membranaceous, 2–3 layered, composed of dark brown cells of *textura angularis*. *Hamathecium* of dense asci, lacking pseudoparaphyses. *Asci* 31–44 µm × 11–13 µm ($\bar{x}$ = 36.8 × 12.3 µm, n = 10), 8-spored, bitunicate, fissitunicate, broadly clavate, with a short pedicel. *Ascospores* 19–28 µm × 7–9 µm ($\bar{x}$ = 24.3 × 8.2 µm, n = 10), oblong to ellipsoid, hyaline when young, turning reddish brown at maturity, 4-celled, slightly constricted at the septum, with hyaline at two end cells. Asexual morph: Undetermined.

Material examined – USA, Oahu, Hawaii, Honolulu, Waiahole Ditch Trail, on leaves of *Rollandia racemosa* (Campanulaceae), 12 June 1921, F.L. Stevens (BISH 499971, isotype).

Economic significance – The fungus in the genus *Limaciniopsis* is associated with filamentous blue-green algae and is a parasitic fungus on the mycelium (Stevens 1922, Clements 1931).

Linopeltis I. Hino & Katum., Bull. Faculty of Agriculture, Yamaguchi University 11: 15 (1960)

Epiphytic or *saprobic* on culms of *Sinobambusa tootsik*. Sexual morph: *Ascostromata* scattered, solitary to gregarious, subcuticular or superficial, with hyphae immersed under host tissue, elongate ellipsoidal or irregular in shape, dark brown to black, hemispherical, shiny, glabrous, multi-loculate, with slit-like opening. *Locules* clustered, globose to subglobose. *Peridium* composed of a single layer of isodiametric cells, thin-walled, dark brown to black with the base comprising of pseudoparenchymatous cells, arranged in a *textura epidermoidea*. *Hamathecium* numerous, filiform, aseptate, broad pseudoparaphyses, embedded in a gelatinous matrix. *Asci* 8-spored, bitunicate, oblong to ellipsoidal, short pedicellate, apically rounded, with indistinct ocular chamber. *Ascospores* overlapping, fasciculate, firstly hyaline, becoming brown at maturity, cylindrical to elongated fusoid, with marginally rounded ends, distoseptate, 6–10-septate, thick and smooth-walled. Asexual morph: Undetermined.

Type species – *Linopeltis ryukyuensis* I. Hino & Katum.

Notes – The genus *Linopeltis* was introduced by Hino & Katumoto (1961) with *Linopeltis ryukyuensis* as the type species. The main characters of the genus are hysterothecial-like ascomata with slit-like openings, oblong to ellipsoidal asci and elongated fusiform to cylindrical, distoseptate ascospores (Phookamsak et al. 2016). The genus was previously placed in Schizothyriaceae by many authors (Von Arx & Müller 1975, Kirk et al. 2008, Lumbsch & Huhndorf 2010, Hyde et al. 2013, Wijayawardene et al. 2014). *Linopeltis* was compared to the genera in Asterinaceae and Aulographaceae in having elongated hysterothecial-like ascomata with slit-like openings (Hyde et al. 2013, Hongsanan et al. 2014, Phookamsak et al. 2016). We examined the holotype specimen of *Linopeltis ryukyuensis* from YAM herbarium under the code YAM 20332. *Linopeltis* shares similar morphological similarities to the genus *Leptopeltis* in having subcuticular or superficial ascostromata, hamathecium comprising numerous broad pseudoparaphyses, bitunicate, cylindrical to cylindric clavate, 8-spored asci. However, the ascospores of the genus *Linopeltis* are distoseptate, 6–10-septate while that of *Leptopeltis* is 0–3-septate. We retain the genus *Linopeltis* in Dothideomycetes, genera *incertae sedis* until fresh collection and molecular data becomes available.

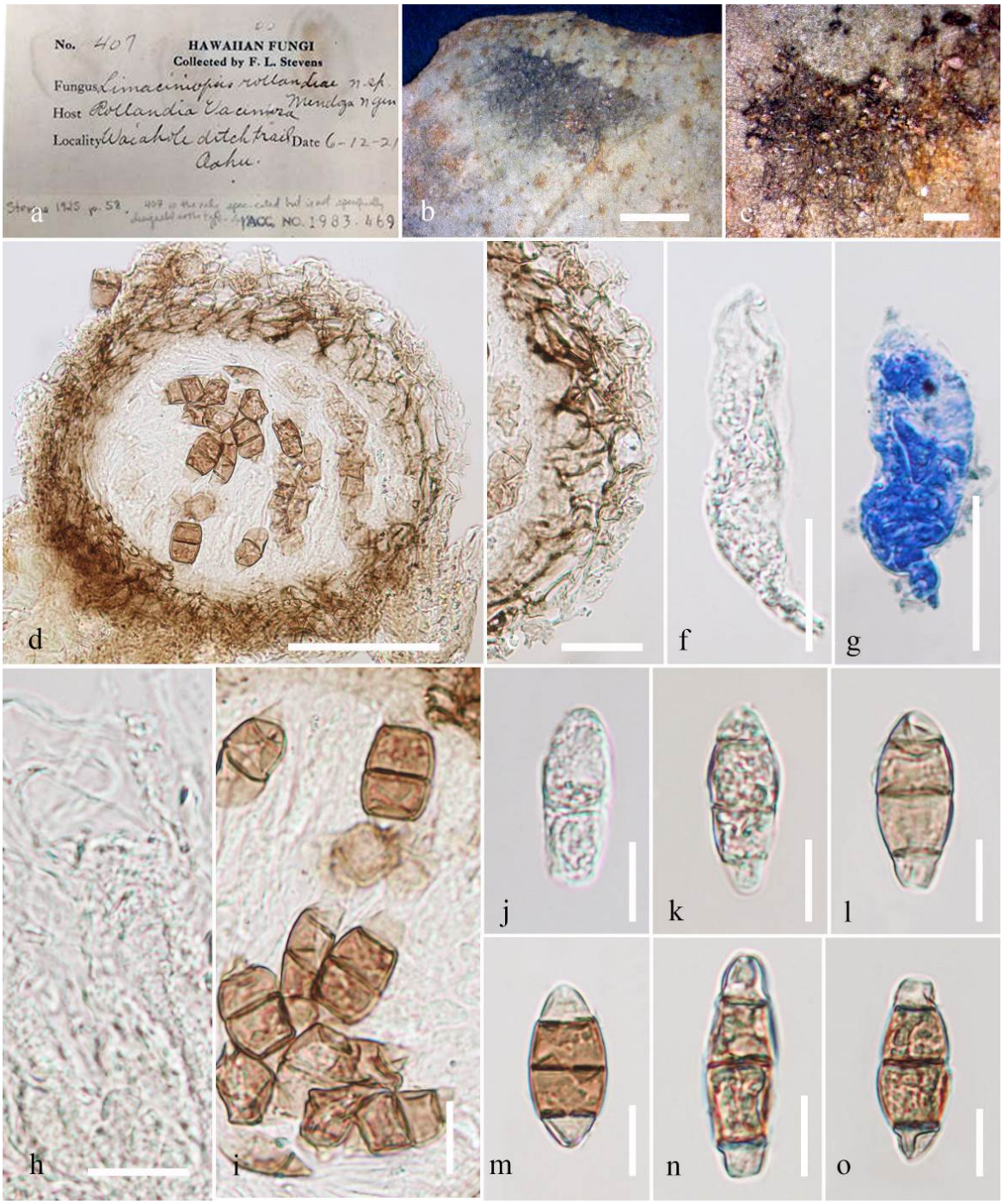

Figure 60 – *Limaciniopsis rollandiae* (BISH 499971, isotype). a Herbarium material. b, c Appearance of ascomata on host surface. d Section of ascoma. e Peridium. f, g Immature ascospores. h Hamathecium. i Asci. j–o Ascospores. Note: g stained in lactophenol cotton blue. Scale bars: b, c = 1 mm, d = 50 µm, e–g = 20 µm, h, i–o = 10 µm.

Linopeltis ryukyuensis I. Hino & Katum., Bull. Faculty of Agriculture, Yamaguchi University 11: 15 (1960) Fig. 61

Index Fungorum number: IF 440969; Facesoffungi number: FoF 01950

Epiphytic or *saprobic* on culms of *Sinobambusa tootsik*. Sexual morph: *Ascostromata* 80–150 µm high, 330–800 µm long, 198–250 µm diam., scattered, solitary to gregarious, subcuticular or superficial, with hyphae immersed under host tissue, elongate ellipsoidal or irregular in shape, dark brown to black, hemispherical, shiny, glabrous, multi-loculate, with slit-like opening. *Locules* 75–150 µm high × 60–170 µm diam., clustered, globose to subglobose. *Peridium* 10–20 µm composed

of a single layer of isodiametric cells, thin-walled, dark brown to black with the base comprising of pseudoparenchymatous cells, arranged in a *textura epidermoidea*. *Hamathecium* numerous, filiform, aseptate, broad pseudoparaphyses, embedded in a gelatinous matrix. *Asci* 45–65 µm × 20–25 µm ($\overline{x}$ = 52.5 × 23.2, n = 10), 8-spored, bitunicate, oblong to ellipsoidal, short pedicellate, apically rounded, with indistinct ocular chamber. *Ascospores* 35–45 µm × 3–4 µm ($\overline{x}$ = 32.2 × 3.6, n = 10), overlapping, fasciculate, firstly hyaline, becoming brown at maturity, cylindrical to elongated fusoid, with marginally rounded ends, distoseptate, 6–10-septate, thick and smooth-walled. Asexual morph: Undetermined.

Material examined – JAPAN, Okinawa, Nakijinson, Jana Kunigamaigun, on branch of *Sinobambusa tootsik* (Poaceae), 26 July 1959, H. Muroi (YAM 20332, holotype).

Economic significance – None has been reported.

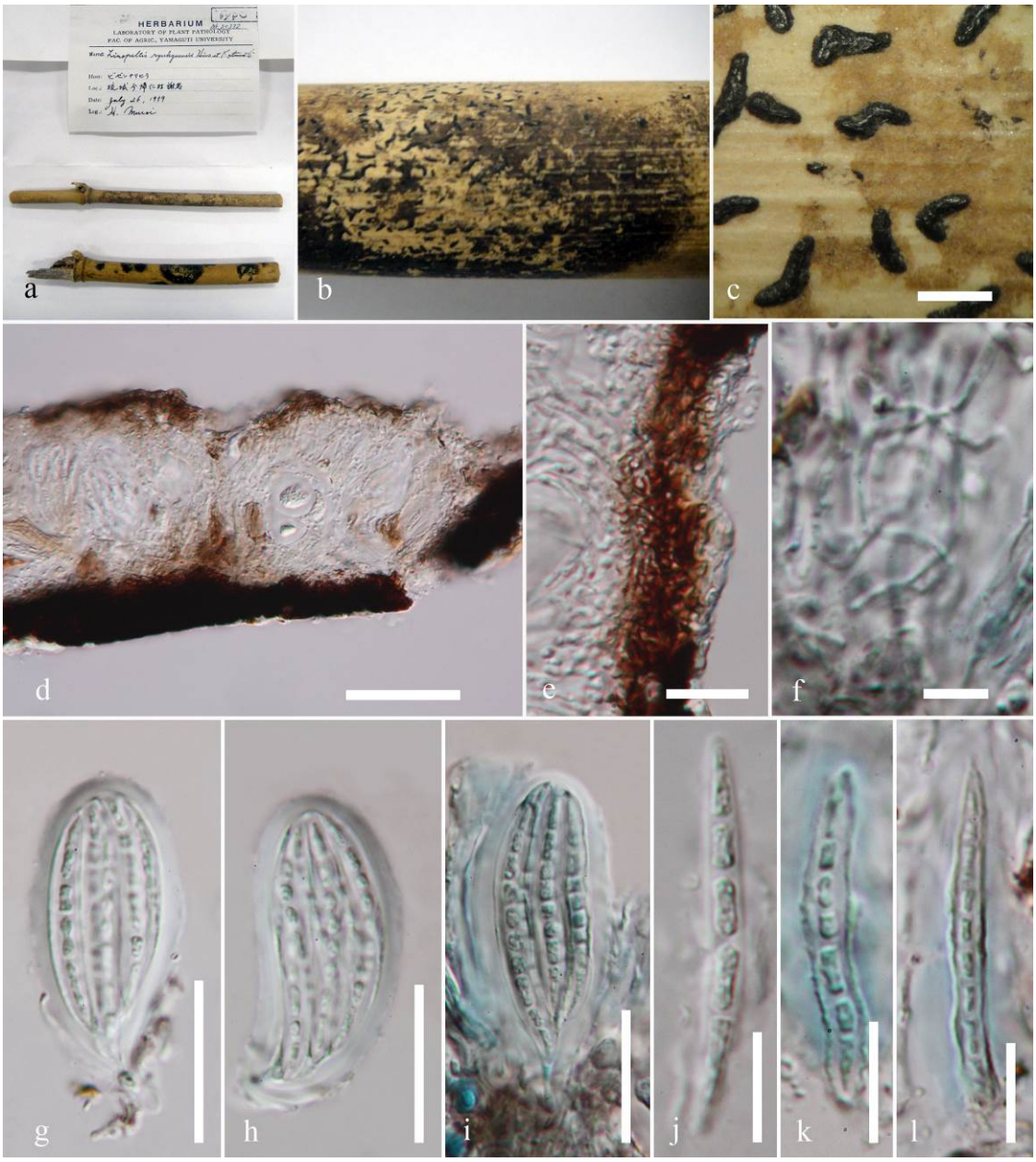

Figure 61 – *Linopeltis ryukyuensis* (YAM 20332, holotype). a Details of herbarium material. b, c Appearance of ascostromata on the host surface. d Sections through ascostromata. e Section through peridium. f Pseudoparaphyses. g–i Asci. j–l Ascospores. Note: i–l stained in lactophenol cotton blue. Scale bars: c = 100 µm, d = 40 µm, e, j–l = 10 µm, f = 5 µm, g–i = 20 µm.

Ascomycota, family *incertae sedis*
Strangosporaceae S. Stenroos, Miądl. & Lutzoni
Kullhemia P. Karst., Meddn Soc. Fauna Flora fenn. 2: 182 (1878)

Lichenized on wood. Sexual morph: *Thallus* crustose, granular, sometimes scurfy, often sparse to absent, scattered, solitary, superficial, grey to blackish. *Apothecia* biatorine, convex, pulvinate, superficial, gregarious or confluent, black, rarely dull blue-black or black brown, translucent when wet. *Apothecial wall* composed of hyaline to pale brown cells of *textura angularis*. *Hymenium* layer composed of asci and paraphyses, with a crust-like excipulum above. *Paraphyses* densely anastomosed. *Asci* clavate, multispored, thick-walled with a distinct ocular chamber. *Ascospores* globose, simple, thin-walled, hyaline. Asexual morph: Undetermined.

Type species – *Kullhemia moriformis* (Ach.) P. Karst.

Notes – The genus *Kullhemia* was introduced by Karst in 1878 with the type species *K. moriformis*. There are two epithets under the genus *Kullhemia* in Index Fungorum (2019). Cultures and sequences are unavailable. The genus *Kullhemia* and *Strangospora* share similarities such as a lichenized habit, bitunicate, wedge-shaped asci and aseptate hyaline ascospores. The genus *Strangospora* is in the subphylum Pezizomycotina, Strangosporaceae, families *incertae sedis* (Lucking et al. 2016, Doilom et al. 2018). We therefore synonymize the genus *Kullhemia* under *Strangospora* and exclude it from Dothideomycetes, genera *incertae sedis*.

Kullhemia moriformis (Ach.) P. Karst., Meddn Soc. Fauna Flora fenn. 2: 183 (1878) Fig. 62

≡ *Arthonia moriformis* Ach., Syn. meth. lich. (Lund): 5 (1814)

Index Fungorum number: IF 156835; Facesoffungi number: FoF 06207

Current name: *Strangospora moriformis* (Ach.) Stein, in Cohn, Krypt.-Fl. Schlesien (Breslau) 2(2): 176 (1879)

Saprobic on unidentified wood. Sexual morph: *Thallus* crustose, granular, sometimes scurfy, often sparse to absent, scattered, solitary, superficial, grey to blackish. *Apothecia* 257–405 µm high × 270–367 µm diam., ($\overline{x}$ = 327.5 × 310.9 µm, n = 10), biatorine, convex, pulvinate, superficial, gregarious or confluent, black, rarely dull blue-black or black brown, translucent when wet. *Apothecial wall* 10–19 µm wide, composed of hyaline to pale brown cells of *textura angularis*. *Hymenium* layer composed of asci and paraphyses, with a crust-like excipulum above. *Paraphyses* densely anastomosed. *Asci* 35–50 µm × 13–18 µm ($\overline{x}$ = 41.9 × 14.0 µm, n = 10), clavate, multispored, thick-walled with a distinct ocular chamber. *Ascospores* 1.9–2.3 µm × 1.8–2.4 µm ($\overline{x}$ = 2.1 × 2.0 µm, n = 10), globose, simple, thin-walled, hyaline. Asexual morph: Undetermined.

Material examined – USA, Minnesota, Tower, on unidentified wood, 29 August 1901, B. Fink (MICH 126713).

Economic significance – The genus *Kullhemia* consist of lichenized species. There is no molecular data available for the taxon.

Sordariomycetes O.E. Erikss. & Winka
Chaetothyriales, family *incertae sedis*
Bahusutrabeeja Subram. & Bhat, Can. J. Bot. 55(16): 204 (1977)

Saprobic on dead stems, twigs, leaves and branches. Sexual morph: undetermined. Asexual morph: Hyphomycetous. *Mycelium* hairy, medium dense, partly immersed, partly superficial, composed of thin, branched, septate, smooth-walled, light brown 2–3 µm hyphae. *Setae* and *hyphopodia* absent. *Conidiophores* distinct, macronematous, mononematous, solitary, erect, straight or slightly flexuous, septate, unbranched, rarely branched, cylindrical, smooth, thick-walled, dark reddish brown near the base, light brown in the apical part. *Conidiogenous cells* monophialidic, terminal, integrated, light brown, smooth, with a conspicuous flared, colarrette at the tip. *Conidia* solitary, simple, slimy, endogenous, hyaline, aseptate, smooth, thick-walled, rounded-cubical to polygonal, spherical to obovoid, hyaline to sub-hyaline, with flexuous, thin, hyaline appendages distributed all over the surface.

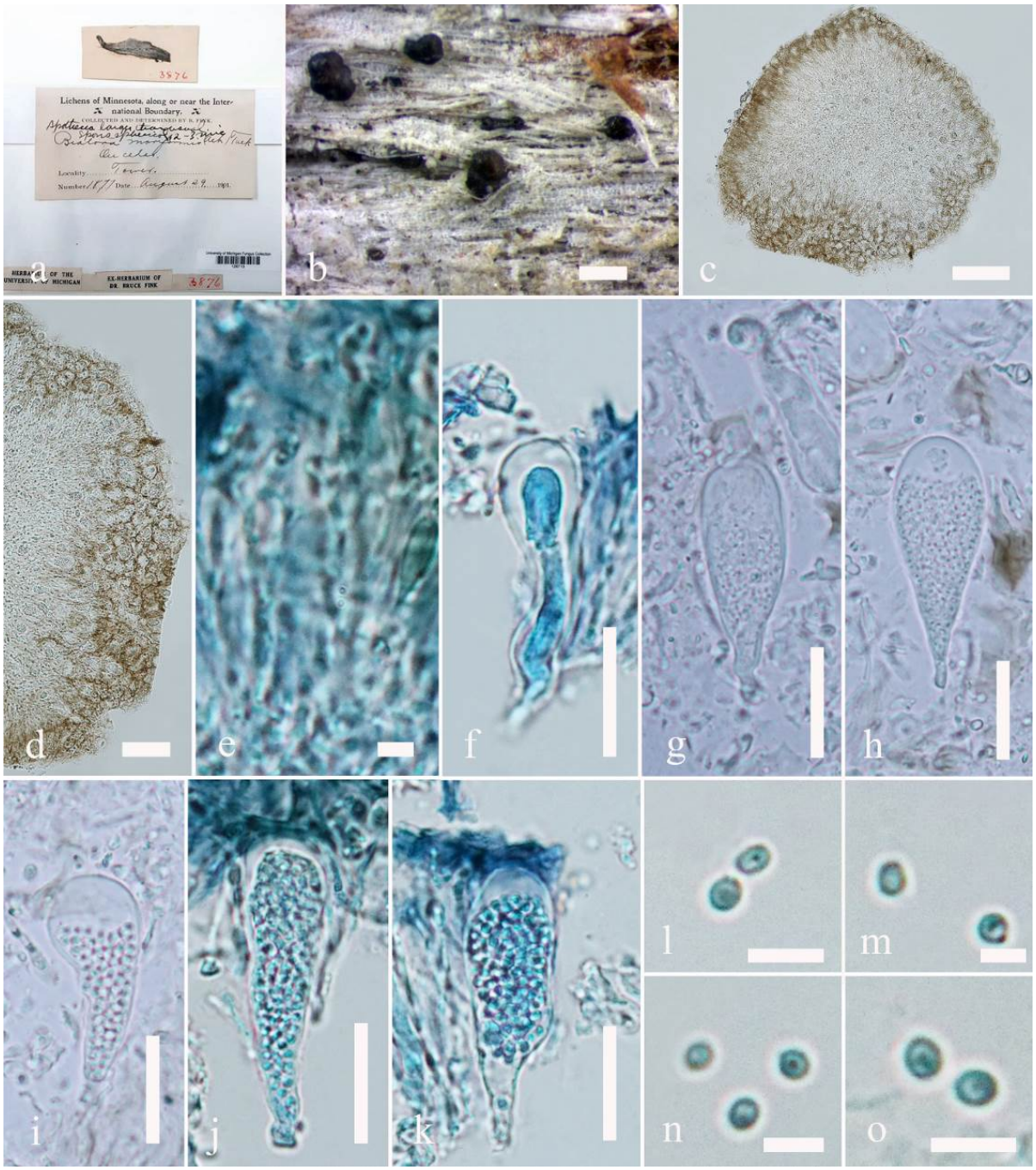

Figure 62 – *Kullhemia moriformis* (MICH 126713) a Details of herbarium material. b Habit and appearance of ascomata on host surface. c Section of ascoma. d Peridium. e Hamathecium. f–k. Asci. l–o Ascospores. Note: e–o stained in lactophenol cotton blue. Scale bars: b = 500 µm, c = 100 µm, d = 50 µm, e, m, n = 5 µm, f–k = 20 µm, l, o = 10 µm.

Type species – *Bahusutrabeeja dwaya* Subram. & Bhat

Notes – The genus *Bahusutrabeeja* was introduced by Subramanian & Bhat (1977) with *Bahusutrabeeja dwaya* Subraman. & Bhat as the type species. *Bahusutrabeeja dwaya* was isolated from dead twigs of *Coffea arabica* L. from India. Currently, five species are accommodated in the genus *Bahusutrabeeja* including *B. angularis* V.G. Rao & de Hoog, *B. bunyensis* McKenzie, *B. dubhashii* Bhat, *B. exappendiculata* Xiao X. Li & X.G. Zhang and *B. globosa* Bhat & W.B. Kendr.. Li et al. (2013) provided a key to species in the genus. The sexual morph is unknown. In a DNA based phylogenetic study conducted by Shenoy et al. (2010), the genus *Bahusutrabeeja* clustered in the Botryosphaeriales. It is currently placed in Botryosphaeriales, genera *incertae sedis* (Wijayawardene et al. 2018). However, in a study of Botryospheriales by Liu et al. (2012), Phillips

et al. (2013) and Yang et al. (2016), there is no mention of the genus *Bahusutrabeeja*. We re-studied a specimen of *B. dwaya* and illustrated the characters (Fig. 13). We also conducted phylogenetic analyses using the putative strain of *Bahusutrabeeja* (GUFCC 4904). The LSU sequence from GUFCC 4904 corresponds to *Neodeightonia palmicola*. However, this strain is not related to the holotype and not supported by morphology. Species of *Neodeightonia* are characterized by spherical to globose, initially hyaline and pale to dark brown conidia with fine striations (Punithalingam 1969, Crous et al. 2006, Phillips et al. 2008, Phillips et al. 2013). However, in the genus *Bahusutrabeeja*, conidia are hyaline to sub-hyaline with appendages distributed all over the surface. Also, *Bahusutrabeeja* is a hyphomycetous genus, while species of *Neodeightonia* and Botryosphaeriaceae are coelomycetous. It is unlikely to place a hyphomycetous genus within the *Neodeightonia* clade. It seems that there must have been a mix-up of cultures and this isolate is not reliable. On the other hand, a BLAST search using the ITS sequence of CBS 261.77, the ex-type culture of *Bahusutrabeeja dwaya* shows 92 to 96 % similarity to the strains of *Chaetosphaeriales* sp. in the Sordariomycetes. We therefore transfer the genus *Bahusutrabeeja* to Chaetothyriales, family *incertae sedis*.

Bahusutrabeeja dwaya Subram. & Bhat, Can. J. Bot. 55(16): 2204 (1977) Fig. 63, 64

Index Fungorum number: IF 309440; Facesoffungi number: FoF 06218

Saprobic on dead twigs of *Coffea arabica* L. Sexual morph: undetermined. Asexual morph: Hyphomycetous. *Mycelium* hairy, medium dense, partly immersed, partly superficial, composed of thin, branched, septate, smooth-walled, light brown 2–3 µm wide hyphae. *Setae* and *hyphopodia* absent. *Conidiophores* 41–90 µm × 3–6 µm ($\bar{x}$ = 57.3 × 4.2 µm, n = 20), distinct, single, macronematous, mononematous, solitary, erect, straight or slightly flexuous, septate, unbranched, rarely branched, cylindrical, smooth, thick-walled, dark reddish brown near the base, light brown in the apical part. *Conidiogenous cells* monophialidic, terminal, integrated, light brown, smooth, with a conspicuous colarrette, 2 µm long, 4 µm wide at the tip. *Conidia* 9–15 µm × 10–15 µm ($\bar{x}$ = 12.6 × 11.4 µm, n = 10), solitary, simple, slimy, endogenous, hyaline, aseptate, smooth, thick-walled, rounded-cubical to polygonal, spherical to obovoid, hyaline to sub-hyaline, with 8–12 µm flexuous, thin, 7–11 µm long, hyaline appendages distributed all over the surface.

Material examined – INDIA, Tamil Nadu. On dead twigs of *Coffea arabica*, (Rubiaceae), 25 May 1977, C.V. Subramanian (K (M) 213921).

Economic significance – The genus *Bahusutrabeeja* has been reported on leaf litter of various hosts (Paulus 2004). *Bahusutrabeeja dwaya* is also pathogenic causing amphigenous brown spots on living leaves of *Mallotus philippinensis* Muell. (Euphorbiaceae) (Wu et al. 2003).

Xylariales, genus *incertae sedis*

Botryohypoxylon Samuels & J.D. Rogers, Mycotaxon 25(2): 631 (1986)

≡ *Iledon* Samuels & J.D. Rogers, Mycotaxon 25(2): 633 (1986)

Parasitic or *lignicolous* on trunks of dead tree. Sexual morph: *Ascostromata* rarely solitary, often cespitose in groups of 2–20 ascomata, ostiolate. Each ascoma arise on a cylindrical pedestal, globose with a tiny, acute papilla, only slightly wider than the pedestal, smooth, not collapsing when dry. *Peridium* with three discrete regions; outer region composed of cells of *textura angularis*, with long axes perpendicular to the surface of the ascomatal wall, individual cells with pigmented walls; middle region composed of cells of *textura epidermoidea*; inner region, the eel is fusoid, non- pigmented. *Ascomatal apex* composed of intertwined hyphae with lumens and pigmented with finger-like periphyses. *Paraphyses* forming a network between the asci, copious, branching, anastomosing, free ends not seen. *Asci* clavate, ascal cytoplasm abruptly narrowed below the ascospores at the point of dehiscence, dehiscing at the midpoint, forming a hymenium over the entire interior of the ascomatal wall, unitunicate with thin ectoascus and endoascus rather thick throughout the entire length of the ascus. *Ascospores* unicellular, hyaline when immature, dark brown, nearly opaque when mature, ellipsoidal. Asexual morph: Undetermined.

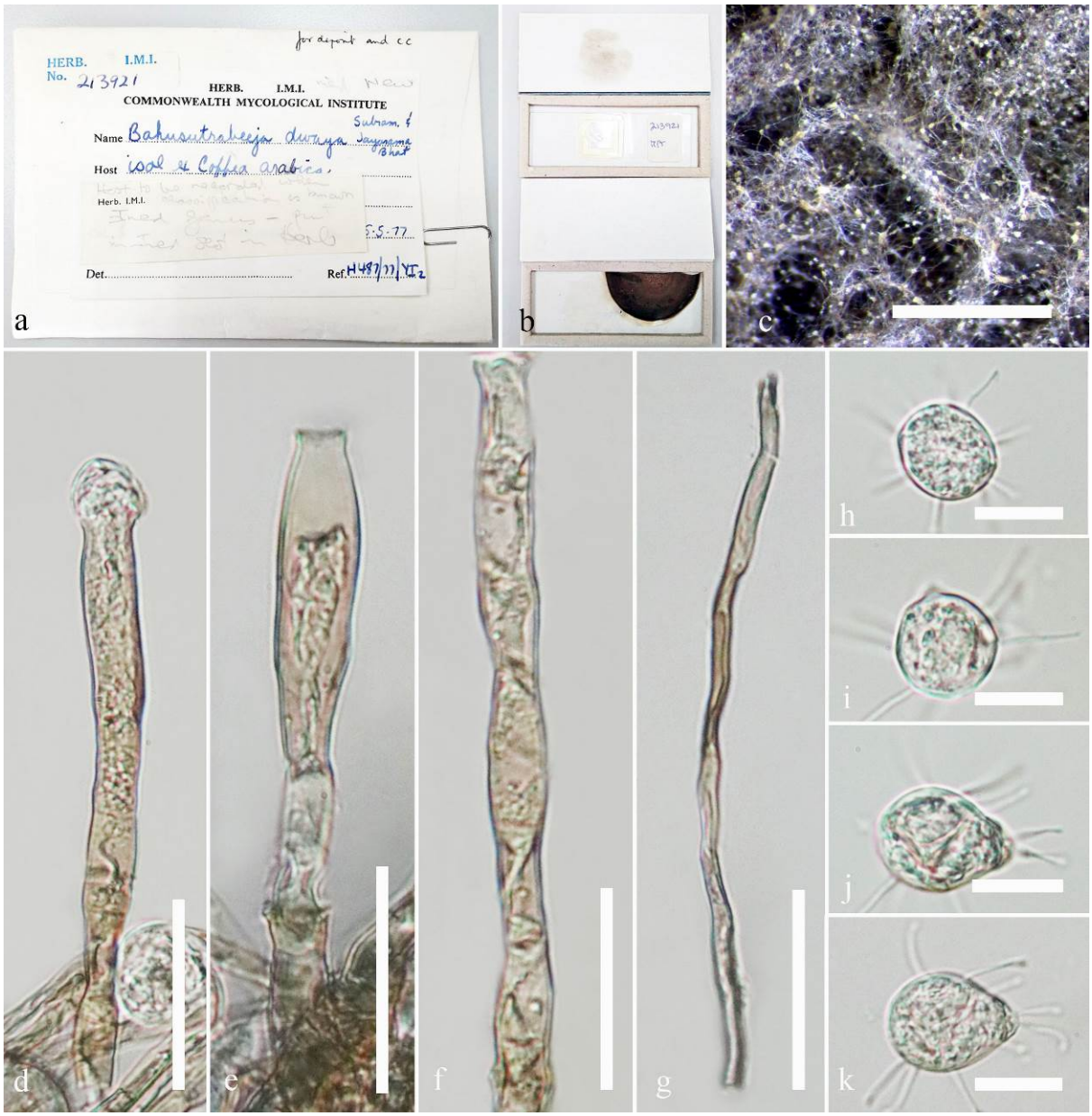

Figure 63 – *Bahusutrabeeja dwaya* (K (M) 213921). a, b Details of herbarium material. c mycelium on dry culture. d–g. Conidiophores. h–k Conidia. Scale bars: c = 1 mm, d–g = 20 µm, h–k = 10 µm.

Type species – *Botryohypoxylon amazonense* Samuels & J.D. Rogers

Notes – Samuels & Rogers (1986) described the monotypic genus *Botryohypoxylon* with the type species *B. amazonense*, collected on trunks of dead trees in Amazonian Venezuela. Morphologically, this genus is distinct in its massive erumpent stroma which is accompanied by 'eustromatic' pycnidia with apparent phialides, unicellular ascospores, clavate, short-stipitate asci with a thin ectotunica and a thick endotunica, hamathecium consisting somewhat wide and branched pseudoparaphyses without free ends. The coelomycetous asexual state was observed in culture and described as *Iledon*. *Botryohypoxylon* is congeneric with *Iledon* (Index Fungorum 2019). Priority to the older sexual state was anticipated by Wijayawardene et al. (2014) and they proposed to use *Botryohypoxylon* over *Iledon.* The original author described *Botryohypoxylon* as unusual among bitunicate ascomycetes in having dark unicellular ascospores termed as an inconspicuous elongated germ-slit and has been found to have somewhat similar characteristics as *Semidelitschia agasmatica* (Cain & Luck-Allen 1969) and *Loculohypoxylon grandineum* (Berk & Rav.) Barr (Barr 1976). However, we re-examined the type specimen of *Botryohypoxylon*

amazonense under the code NY02980804 and found that *Botryohypoxylon* has unitunicate rather than bitunicate asci. We therefore transfer the genus *Botryohypoxylon* to Xylariales, genera *incertae sedis*.

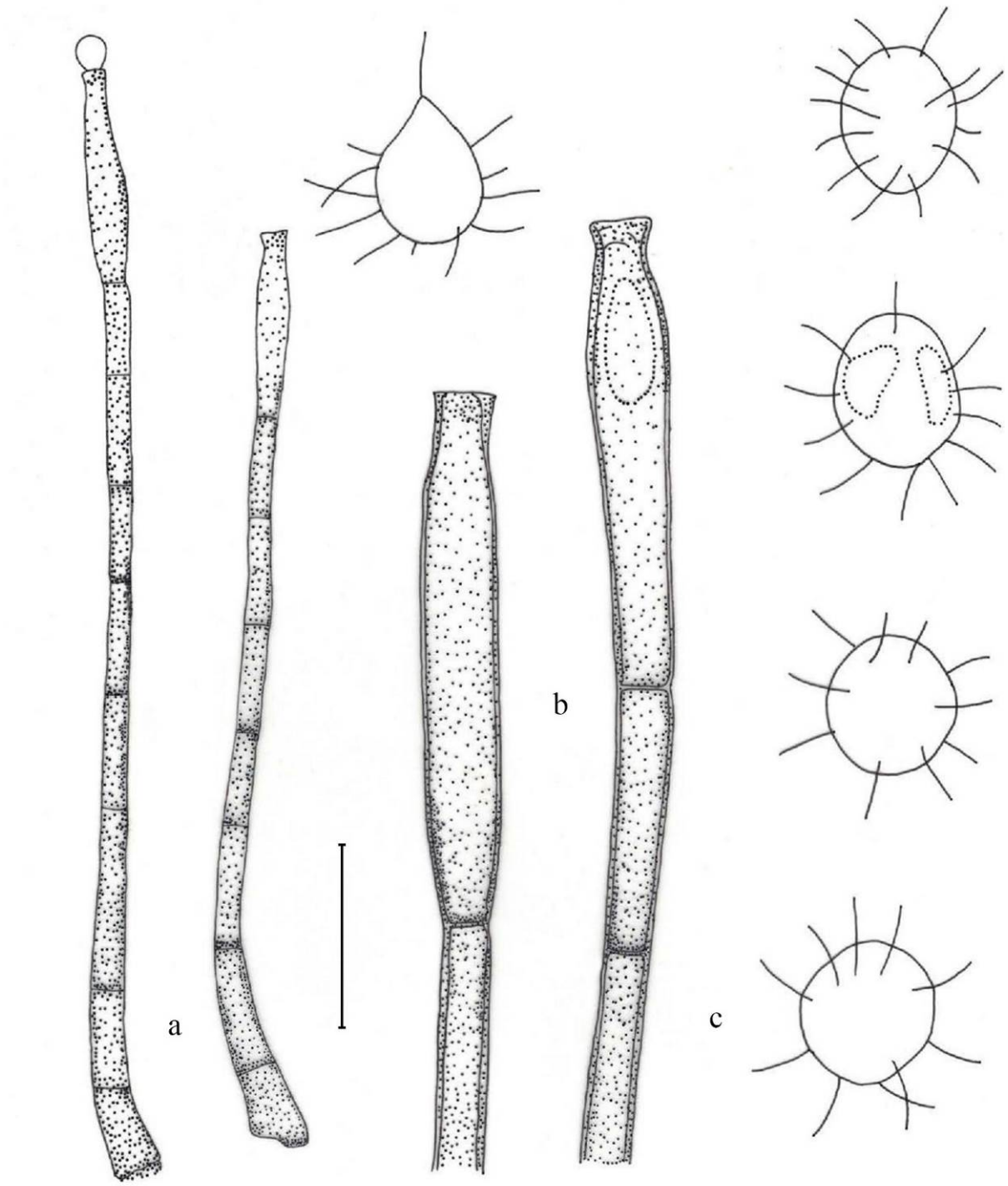

Figure 64 – *Bahusutrabeeja dwaya* (redrawn from Wu et al. 2003). a, b. Conidiophores and conidiogenous cells. c. Conidia. Scale bars: a = 50 µm, b, c = 20 µm.

Botryohypoxylon amazonense Samuels & J.D. Rogers, Mycotaxon 25(2): 633 (1986) Fig. 65

Index Fungorum number: 214383; Facesoffungi number: FoF 06221

Parasitic or *lignicolous* on dead trunks of tree. Sexual morph: *Ascostromata* rarely solitary, often cespitose in groups of 2–20, individually 600–700 µm diam. with locule 550 µm diam,

ostiolate, thickened subiculum. Each ascoma arise on a cylindrical 1 mm long × 0.5 mm wide pedestal, globose with a tiny, acute papilla, only slightly wider than the pedestal, smooth, not collapsing when dry. *Peridium* 130 µm thick, with three discrete regions. Outer region 26–37 µm wide, composed of cells of *textura angularis*, with long axes perpendicular to the surface of the ascomatal wall, individual cells 7–9 µm in greatest dimension with pigmented walls 1-2 µm thick. Middle region 25–35 µm wide, composed of cells of *textura epidermoidea*. Inner region 10–20 µm wide, the eel is fusoid, non- pigmented. Ascomatal apex composed of intertwined hyphae with lumens 1–2 µm wide and 3 µm thick and pigmented with finger-like periphyses. *Pseudoparaphyses* 2 µm wide, forming a network between the asci, copious, branching, anastomosing, free ends not seen. *Asci* 51–85 µm × 6–9 µm ($\overline{x}$ = 65.8 × 8.0, n = 20), 8-spored, unitunicate with thin ectoascus and endoascus rather thick throughout the entire length of the ascus, clavate, ascal cytoplasm abruptly narrowed below the ascospores at the point of dehiscence, dehiscing at the midpoint, forming a hymenium over the entire interior of the ascomatal wall. *Ascospores* 6.7–7.9 µm × 4.3–5.0 µm ($\overline{x}$ = 7.1 × 4.5, n = 20), uni to biseriate, ellipsoidal, unicellular, hyaline when immature, dark brown, nearly opaque when mature, smooth-walled. Asexual morph: Undetermined.

Material examined – VENEZUELA, on trunks of dead tree (Leguminosae), along Rio Mawarinuma, just outside Canon Grande vicinity of Neblina base camp, *ca*. 140 m, 00°50'N, 66°10'W; low primary forest on white sand, 30 April 1984, Gary J. Samuels (1703) & W. Thomas, (NY02980804, holotype).

Economic significance – The genus *Botryohypoxylon* is parasitic or possibly lignicolous on trees in Amazonian Venezuela. No other economic significance havehas been reported (Samuels & Roger 1986).

Sporocadaceae Corda 1842

Dilophospora Desm., Annls Sci. Nat., Bot., sér. 2 14: 6 (1840)

Pathogenic on the surface of living leaves. Sexual morph: Undetermined. Asexual morph: *Conidiomata* stromatic, varying from pycnidioid to indeterminate, subepidermal, immersed, uni- to plurilocular, locules sometimes tortuous, dark brown to brown, glabrous, wall of *textura angularis* or *textura globulosa*, occasionally of *textura prismatica*, cells thick-walled, dark brown to brown in the outer layers, becoming thin-walled and paler towards the conidial hymenium. *Conidiophores* ascending from the inner layers lining the conidioma, or at the base and extending part way up the side walls, rarely septate and intermittently branched, frequently reduced to conidiogenous cells. *Conidiogenous cells* hyaline, thin-walled, smooth, with percurrent proliferations, and with apical periclinal thickenings. *Conidia* cylindrical to fusoid with an acute or blunt apex and a truncate base, straight or slightly curved, 3–4-euseptate, with hyaline apical cell, other cells hyaline, with smooth wall, with or without constrictions at septa, with multiple apical appendages, each arising as a tubular extension of the apical cell, not separated from a septum, appendages with 2–4 narrow, attenuated, flexuous, divergent branches, basal appendage tubular, single, branched, exogenous, filiform, flexuous.

Type species – *Dilophospora alopecuri* (Fr.) Fr.

Notes – The asexual genus *Dilophospora* was introduced by Desmazières (1840) for the pathogenic fungus *D. graminis* (= *D. alopecuri*) occurring on wide range of grasses in Europe and previously described by Fries (1828) under the name *Sphaeria alopecuri*. This was followed by Grove (1935). Later, the species was transferred to the genus *Dilophospora* under the name of *Dilophosphora alopecuri* Fries. The genus is characterized by stromatic conidiomata, a conidiomatal cell wall of *textura angularis*, conidiophores with percurrent proliferations and cylindrical to fusoid conidia with an acute or blunt apex and a truncate base with multiple apical appendages. Currently, two species are accepted in the genus. The sexual morph is unknown. Cultures and sequences are unavailable. An examination of the specimen and descriptions of *Dilophospora alopecuri* is provided below. The species in the genus *Dilophospora* are similar to those in Sporocadaceae in having unique appendage bearing conidia. The stromatic conidiomata, peridium of *textura globulosa* and *textura prismatica* of *Dilophospora alopecuri* fits well with

species in Sporocadaceae. Therefore, based on various morphological similarities, we place the genus *Dilophospora* in Sporocadaceae (Amphisphaeriales, Sordariomycetes).

Figure 65 – *Botryohypoxylon amazonense* (NY02980804, holotype) a, b Herbarium specimen and habit on trunks of dead tree. c–e Appearance of ascomata on host surface. f Median longitudinal

section through a mature ascomata. g Section of ascomata. h Ostiole. i Peridium. j Asci with branching pseudoparaphyses. k–m Asci. n Dehisced bitunicate ascus, arrow indicates the point of dehiscence. o–r Ascospores, arrows indicate spores that have visible germination sites or germ-slit. Scale bars: c–e = 500 μm, g–h = 100 μm, i–n = 50 μm.

Dilophospora alopecuri (Fr.) Fr., Summa veg. Scand., Sectio Post. (Stockholm): 419 (1849)
Fig. 66

≡ *Sphaeria alopecuri* Fr., Elench. fung. (Greifswald) 2: 90 (1828)

Index Fungorum number: IF 182994; Facesoffungi number: FoF 06234

Pathogenic on the surface of living leaves of *Festuca rubra*. Sexual morph: Undetermined. Asexual morph: *Conidiomata* 230–390 μm high × 373–599 μm diam., stromatic, varying from pycnidioid to indeterminate, subepidermal, immersed, uni- to plurilocular, dark brown to brown, glabrous. *Pycnidial wall* 16–35 μm consists of two layers, thick outer wall of brown *textura globulosa*, and inner layer of paler brown to hyaline *textura prismatica*. *Conidiophores* ascending from the inner layers lining the conidioma, or at the base and extending part way up the side walls, lightly septate and intermittently branched, frequently reduced to conidiogenous cells, hyaline, thin and smooth-walled, with percurrent proliferations, and apical periclinal thickenings. *Conidia* 11–15 μm × 1–2 μm ($\overline{x}$ = 12.7 × 1.9 μm, n = 20), cylindrical to fusoid with an acute or blunt apex and a truncate base, straight or slightly curved, 3–4 euseptate, apical cell hyaline, other cells hyaline, smooth-walled, with or without constrictions at septa, apical appendage multiple, arising as a tubular extension of the apical cell and not separated from it by a septum, with 2–4 narrow, attenuated, flexuous, divergent branches, basal appendage tubular, single, branched, exogenous, filiform, flexuous.

Material examined – SWEDEN, Knivsta, Uppsala County, on leaves of *Festuca rubra* (Poaceae), June 1876, G. Löfgren (S-F44045).

Economic significance – Species of the genus *Dilophosphora* are plant pathogens. *Dilophospora alopecuri* can infect rye, wheat and other cereals (Barbetti & Riley 2006). The species relies on a nematode species of the genus *Anguina* to spread by their conidia, adhering to the hosts and infect plants directly leading to leaf spots and distortions (Asad et al. 2007). The mycelium can enter developing seeds making them unsuitable for cultivation (Bird 1987). *Dilophospora alopecuri* also has potential as a biopesticide for the management of annual rye grass toxicity (Yan & Riley 2005).

Sordariomycetes genera *incertae sedis*

Hassea Zahlbr., Beih. Botan. Centralbl. 13: 150 (1902)

Lichenicolous on the rock. Sexual morph: *Ascomata* perithecial, subglobose to applanate, carbonaceous, black, smooth or rough, semi-immersed or superficial in the thallus of the host, ostiolate, with a central ostiole located in a papilla; singly scattered or more rarely crowded in small groups, slightly glistening. *Peridium* continuous, composed of three layers: an inner excipular layer and two outer involucrellum layers; extemal involucrellum layer is carbonaceous, consisting of isodiametric, thick-walled cells, with enlarged lumina and black walls; intemal involucrellum layer is colorless to black, paraplectenchymatous, consisting of isodiametric, thin-walled cells, with enlarged lumina and a colorless to pigmented wall; intemal involucrellum layer is thicker than the extemal one; excipular layer: thinner, hyaline, composed of cells becoming laterally compressed, with thin, colorless walls and enlarged lumina. *Hamathecium* composed of paraphyses and periphyses. *Paraphyses* septate, simple and poorly branched becoming evanescent, branched, hymenial gelatineous. *Asci* elongate claviform to cylindrical, shortly stalked, unitunicate, thin-walled, slightly thickened at the apex of young asci, 8-spored. *Ascospores* overlapping in the ascus, simple, cylindrical to filiform, one or more transverse septa, not constricted at the septa, thin-walled without mucilaginous sheath. Asexual morph: Undetermined.

Type species – *Hassea bacillosa* (Nyl.) Zahlbr.

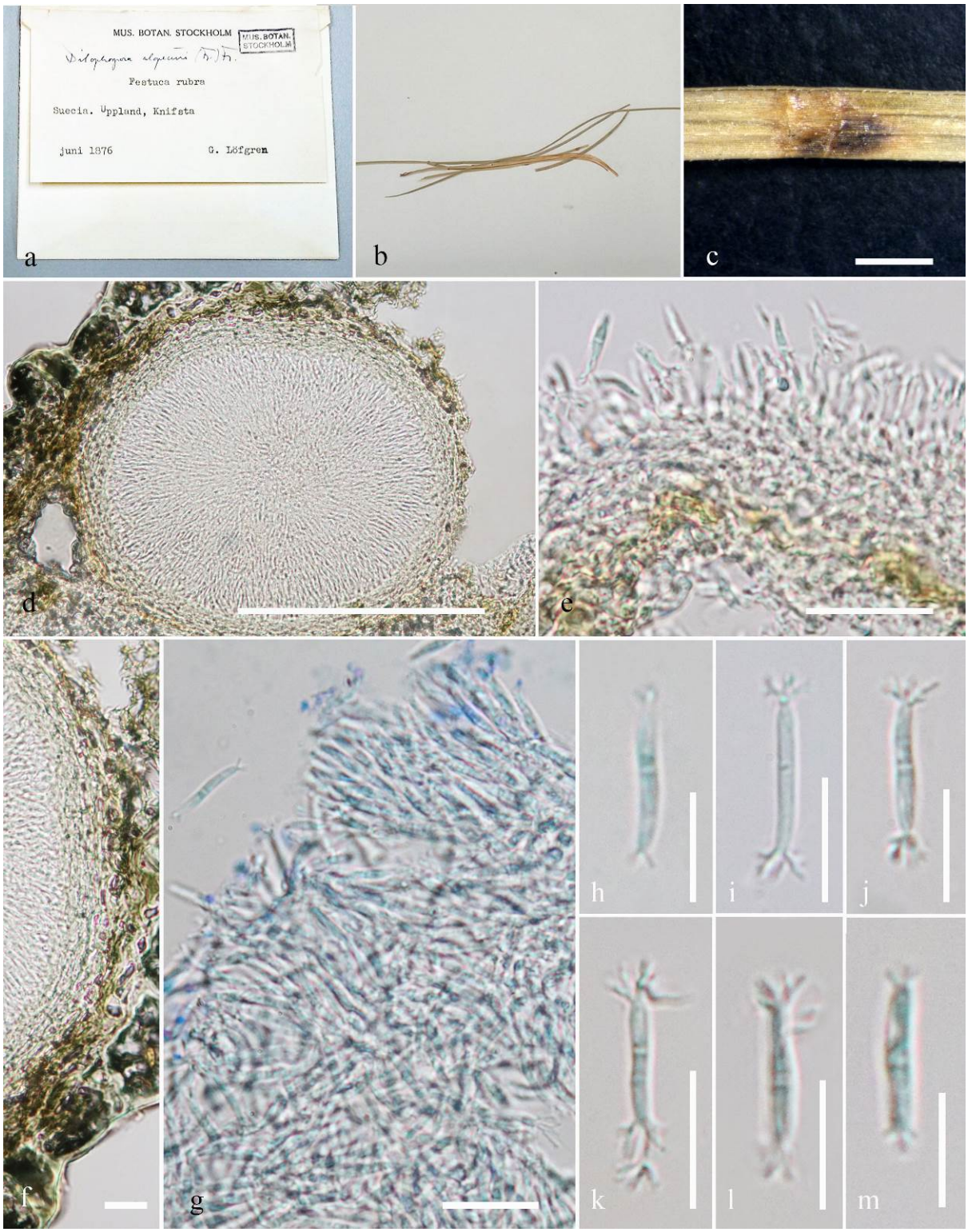

Figure 66 – *Dilophospora alopecuri* (F44045). a Details of herbarium material. b, c Habit and appearance of ascomata on host surface. d Section of conidioma. e Conidiogenesis. f Peridium. g Conidia. h–m Conidia. Note: g–m stained in lactophenol cotton blue. Scale bars: c = 1 mm, d = 200 µm, e, g = 20 µm, f, h–m = 10 µm.

Notes – *Hassea* was introduced by Zahlbruckner (1902) to accommodate the type species *H. bacillosa* (Nyl.) Zahlbr. and is characterised by perithecial ascomata, elongate claviform to cylindrical unitunicate asci and hyaline, cylindrical-bacilliform ascospores. *Hassea* was included as a genus in Dothideomycetes genera *incertae sedis* (Lumbsch & Huhndorf 2010, Kirk et al. 2013, Wijayawardene et al. 2018). The asexual morph is unknown. Cultures and sequences are

unavailable for the type species. We re-examined the type specimen *Hassea bacillosa* from FH under the code FH 00213640. Based on its morphology *Hassea* could not be accommodated in any of the family in the class Dothideomycetes. We therefore, transfer the genus *Hassea* to Sordariomycetes genera *incertae sedis* based on its claviform to cylindrical unitunicate asci.

Hassea bacillosa (Nyl.) Zahlbr., Beih. Botan. Centralbl. 13: 150 (1902) Fig. 67

≡ *Verrucaria bacillosa* Nyl., Lichens of South California, edn 2: 20 (1898)

Index Fungorum number: IF 386699; Facesoffungi number: FoF 06246

Lichenicolous on the rock. Sexual morph: *Ascomata* 275–295 µm high × 235–275 µm diam., perithecial, subglobose to applanate, carbonaceous, black, smooth or rough, semi-immersed or superficial in the thallus of the host, ostiolate, with a central ostiole located in a papilla; singly scattered or more rarely crowded in small groups, slightly glistening. *Peridium* 18–45 µm continuous, composed of three layers: an inner excipular layer and two outer involucrellum layers; extemal involucrellum layer carbonaceous, consisting of isodiametric, thick-walled cells, with enlarged lumina and black walls; intemal involucrellum layer colorless to black, paraplectenchymatous, consisting of isodiametric, thin-walled cells, with enlarged lumina and a colorless to pigmented wall; intemal involucrellum layer thicker than the extemal one; excipular layer: thinner, hyaline, composed of cells becoming laterally compressed, with thin, colorless walls and enlarged lumina. *Hamathecium* 0.8–1.9 µm composed of paraphyses and periphyses. *Paraphyses* septate, simple, poorly branched becoming evanescent, branched, hymenial gelatineous. *Asci* 46–69 µm × 8–10 µm ($\overline{x}$ = 56.2 × 9.3 µm, n = 10), 8-spored, elongate claviform to cylindrical, shortly stalked, unitunicate, thin-walled, slightly thickened at the apex of young asci. *Ascospores* 29–39 µm × 2.3–2.4 µm ($\overline{x}$ = 35.5 × 2.3 µm, n = 10), overlapping in the ascus, simple, cylindrical to filiform, one or more transverse septa, not constricted at the septa, thin-walled without mucilaginous sheath. Asexual morph: Undetermined.

Material examined – USA, California, foothills of the Santa Monica Range near the Soldiers Horne, on the rock, 1 January 1897, A. Zahlbruckner (FH 00213640, holotype).

Economic significance – None is reported.

Bahusakala Subram., J. Indian bot. Soc. 37: 63 (1958)

Pathogenic on leaves in terrestrial habitat. Sexual morph: Undetermined. Asexual morph: Hyphomycetous. *Mycelium* hairy, dense, partly immersed, partly superficial, congested, effuse, composed of branched, septate, thick-walled, olive-black hyphae. *Stroma* none. *Setae* and *hyphopodia* absent. *Conidiophores* distinct, solitary, macronematous, mononematous, arthric, erect, branched, cylindrical, smooth to verruculose, septate, thick-walled, producing arthroconidium. *Conidiogenous cells* holothallic, terminal, integrated, brown, smooth, 8 µm long, 3 µm wide at the tip. *Conidia* simple, more or less cylindrical or oblong, brown or dark brown, smooth, wrinkled or verrucose with one or more transverse septa.

Type species – *Bahusakala olivaceonigra* (Berk. & Broome) Subram.

Notes – *Bahusakala olivaceonigra* is the type species of genus *Bahusakala*, which comprises six species (Index Fungorum 2019). According to Seifert et al. (2011), the genus *Bahusakala* probably has sexual morphs in *Aulographina* (Asterinaceae, Dothideomycetes) or *Xylogone* (Leotiomycetes) but this information warrants further studies. This fungus can be found in areas with a wide range of climatic conditions (Farr & Rossman 2017) and has been reported to cause leaf blight disease of the sisal (*Agave sisalana*). In this study, we re-examined the holotype specimen of *Bahusakala olivaceonigra*. We also did phylogenetic analysis using the putative strains of *Bahusakala longispora* CBS 544.84. The latter forms a distinct clade in the Sordariomycetes with low bootstrap support (Fig. 68). Species of *Bahusakala* resemble *Parasympodiella* in having distinct, single conidiophores with terminal and intercalary, integrated, indeterminate, sympodially extending, conidiogenous cells that produce catenate, cylindrical, thallic conidia by disarticulations of the fertile branches. *Parasympodiella* is accommodated in its

own family Parasympodiellaceae, Parasympodiellales (Hernández-Restrepo et al. 2017). We place the genus *Bahusakala* in Sordariomycetes, genera *incertae sedis*.

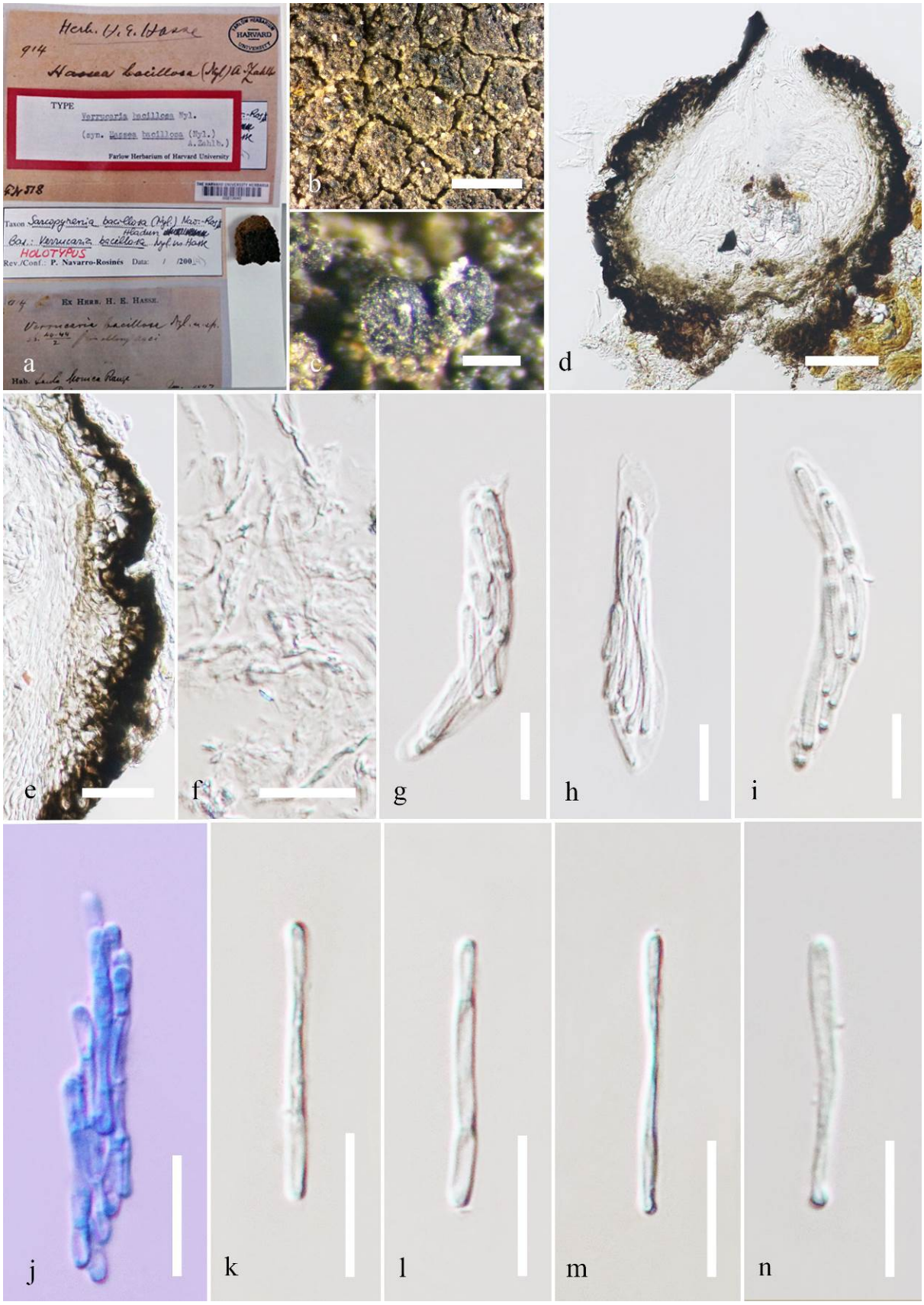

Figure 67 – *Hassea bacillosa* (FH 00213640, holotype). a Details of herbarium material. b, c Habit and appearance of ascomata on host surface. d Section of ascoma. e Peridium. f Hamathecium. g–i

Asci. j–n Ascospores. Note: j stained in lactophenol cotton blue. Scale bars: b = 2 mm, c = 200 µm, d = 100 µm, e = 30 µm, f = 10 µm, g–n = 20 µm.

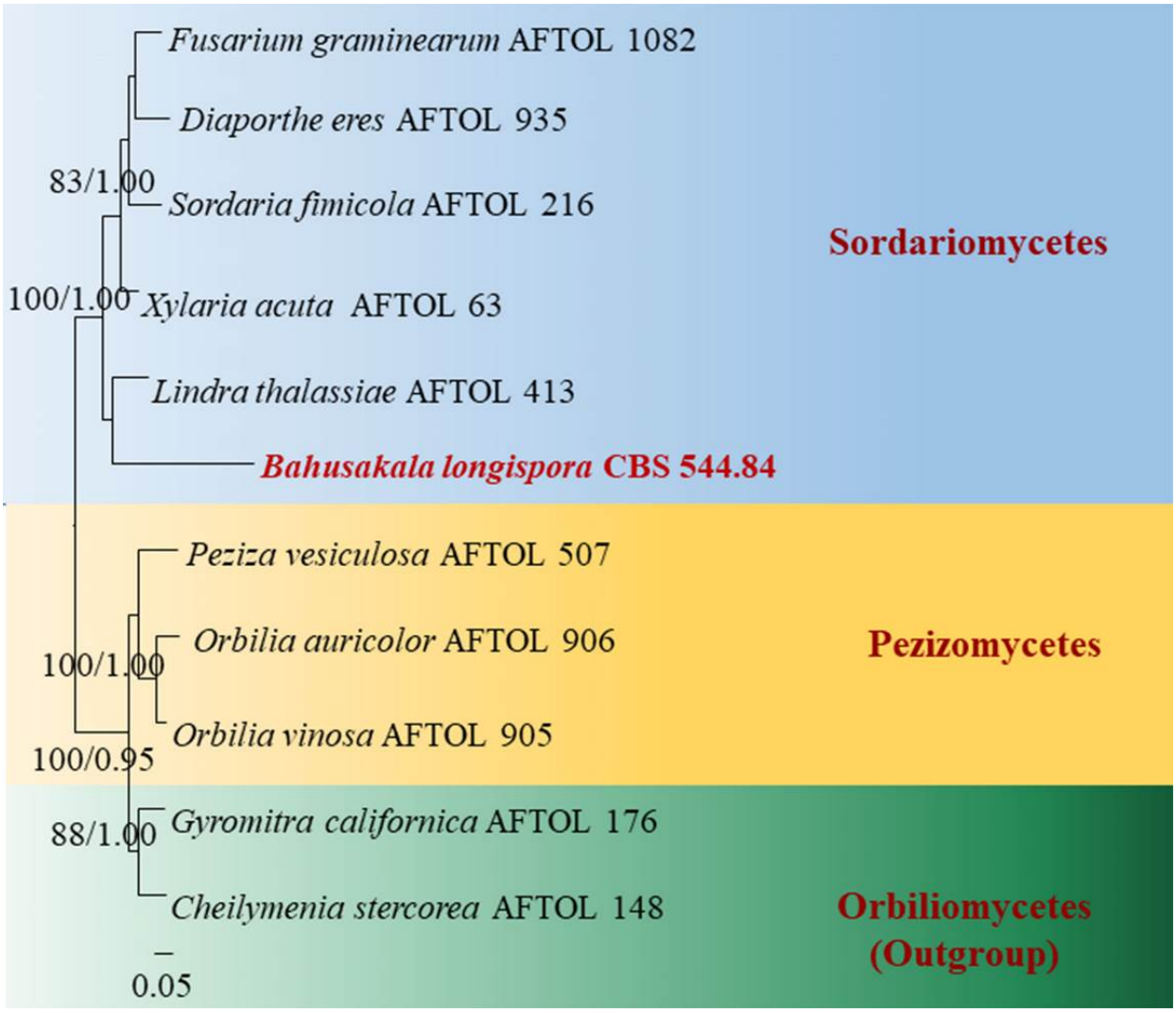

Figure 68 – Phylogram generated from maximum likelihood analysis based on combined LSU, sequence data retrieved from the GenBank. Related sequences were referred to Liu et al. (2017). Eleven taxa are included in the genes sequence analyses which comprise total 923 characters after alignment. *Gyromitra californica* (AFTOL 176) and *Cheilymenia stercorea* (AFTOL 148) are used as the out-group taxa. Maximum likelihood (ML) analysis was conducted in the CIPRES Science Gateway V. 3.3. The best sorting RaXML tree with a final likelihood value of -4643.563264 is presented. Estimated base frequencies were as follows: A = 0.252550, C = 0.217382, G = 0.308330, T = 0.221738; substitution rates AC = 0.405017, AG = 1.017741, AT 0.509145, CG = 0.483871, CT = 4.087105, GT = 1.000000; gamma distribution shape parameter α = 0.580334; proportion of invariant 0.318519. ML bootstrap values ≥ 50% are given as the first set of numbers and approximate likelihood-ratio test (aLRT) ≥ 0.90 values as the second set of numbers above the nodes. Voucher/strain numbers are given after the taxon names, the one from type material are indicated in bold face. Sequence of interest is indicated in red. The bar length indicates the number of nucleotide substitutions per site.

Bahusakala olivaceonigra (Berk. & Broome) Subram. [as 'olivaceo-nigra'], J. Indian bot. Soc. 37: 63 (1958) Fig. 69, 70

≡ *Septonema olivaceonigrum* Berk. & Broome, J. Linn. Soc., Bot. 14(no. 74): 90 (1873) [1875]

Index Fungorum number: IF 293585; Facesoffungi number: FoF 06217

Figure 69 – *Bahusakala olivaceonigra* (K (M) 109483, holotype). a, b Herbarium specimen and habit on leaf. c Squash mount of conidioma. d–g Conidiophores. h–k Conidia. Scale bars: b = 1 mm, c = 30 µm, d–g = 10 µm, h–k = 5 µm.

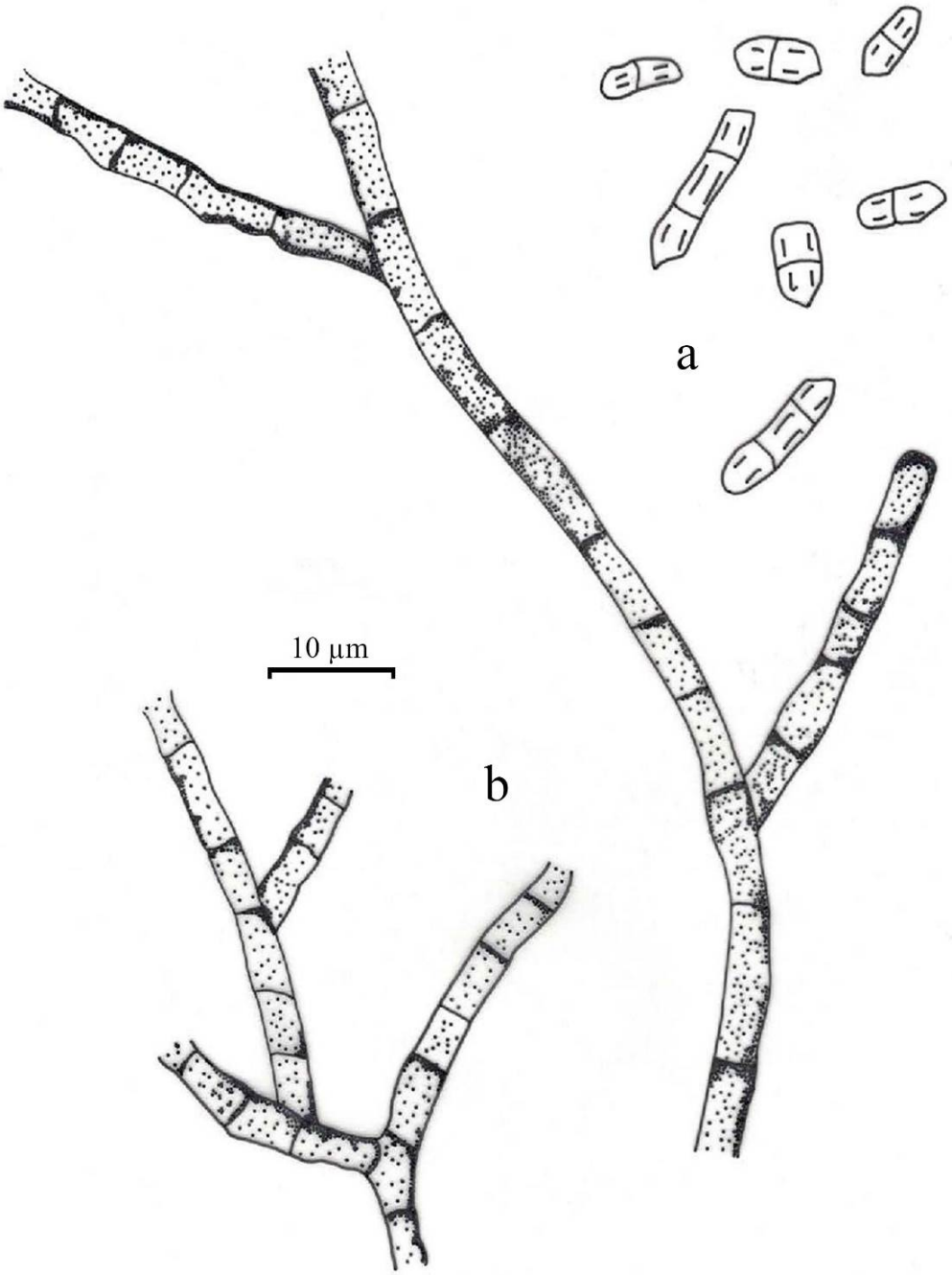

Figure 70 – *Bahusaka1a olivaceonigra* (redrawn from Guarro et al. 1980). a. Conidia b. Conidiophores. Scalebar: x = 10 µm.

Pathogenic on leaves of *Agave sisalana* in terrestrial habitat. Sexual morph: Undetermined. Asexual morph: Hyphomycetous. *Mycelium* hairy, dense, partly immersed, partly superficial, congested, effuse, composed of branched, septate, thick-walled, olive-black 2–3.5 µm hyphae. *Stroma* none. *Setae* and *hyphopodia* absent. *Conidiophores* 28–60 µm × 2.5–3.5 µm ($\bar{x}$ = 38 × 3 µm, n = 20), distinct, solitary, macronematous, mononematous, arthric, erect, branched, cylindrical, smooth to verruculose, septate, thick-walled, producing arthroconidium. *Conidiogenous cells* 7–8.5 µm × 2–4 µm ($\bar{x}$ = 8 × 3 µm, n = 20), holothallic, terminal, integrated, brown, smooth, 8 µm long, 3 µm wide at the tip. *Conidia* 6.4–12.3 µm × 2.8–4.4 µm ($\bar{x}$ = 8.1 × 3.4 µm, n = 10), simple, more or less cylindrical or oblong, brown or dark brown, smooth, wrinkled or verrucose with one or more transverse septa.

Material examined – SRI LANKA, on leaves of *Agave sisalana* (Asparagaceae), 1873, G.H.K Thwaites (K (M) 109483, holotype).

Economic significance – The genus *Bahusakala* is the causal organism of leaf blight disease of the sisal (*Agave sisalana*). The fungus can infect the leaf tissue through wounding (Phuphaibun et al. 1980). It has also been identified as seed-borne mycota from seed samples collected from various localities of Pakistan and other countries (Rahim et al. 2013).

Table 1 The circumscription of different genus in the class Dothideomycetes as it changed during the past decade.

	Treatment of genus in different publications				
Families/ Genera	**Lumbsch & Hundorf (2007)**	**Lumbsch & Hundorf (2010)**	**Wijayawardene et al. (2014)**	**Wijayawardene et al. (2018)**	**This study**
Asterinales M.E. Barr ex D. Hawksw. & O.E. Erikss. (= *Asterotexales* Firmino et al.)					
Asterinaceae Hansf.	*Dothidasteromella* Höhn.	*Dothidasteromella* Höhn.			*Dothidasteromella* Höhn.
Botryosphaeriales C.L. Schoch, Crous & Shoemaker					
Botryosphaeriaceae Theiss. & H. Syd.					*Gibberidea* Fuckel
Capnodiales Woron.					
Antennulariellaceae Woron.					*Eumela* Syd.
Mycosphaerellaceae Lindau				*Anguillosporella* U. Braun	
Schizothyriaceae Höhn. ex Trotter et al.	Linopeltis I. Hino & Katum.	*Linopeltis* I. Hino & Katum.	*Linopeltis* I. Hino & Katum.		
Dothideales Lindau					
Dothideaceae Chevall.					
Dothioraceae Theiss. & H. Syd.	*Botryochora* Torrend	*Botryochora* Torrend			
Dothideales, genus *incertae sedis*					*Botryochora* Torrend
Microthyriales G. Arnaud 1918					
Microthyriaceae Sacc.	*Asteronia* (Sacc.) P. Henn. *Asterinema* Bat. & Gayao	*Asteronia* (Sacc.) P. Henn *Asterinema* Bat. & Gayao			

Table 1 Continued.

Families/ Genera	Lumbsch & Hundorf (2007)	Lumbsch & Hundorf (2010)	Wijayawardene et al. (2014)	Wijayawardene et al. (2018)	This study
Pleosporales Luttr. ex M.E. Barr					
Dothidotthiaceae Crous & A.J.L. Phillips					*Belizeana* Kohlm. & Volkm.
Lophiostomataceae Sacc.	*Byssolophis* Clem.	*Byssolophis* Clem.			
Lophiotremataceae K. Hiray. & Kaz. Tanaka					*Koordersiella* Höhn.
Massariaceae Nitschke	*Dothivalsaria* Petr.	*Dothivalsaria* Petr.			
Massarinaceae Munk					*Byssothecium* Fuckel
Pleomassariaceae M.E. Barr	*Asteromassaria* Höhn.	*Asteromassaria* Hohn.			
Pleosporaceae Nitschke					*Gibbago* E.G. Simmon
Teichosporaceae M.E. Barr	*Byssothecium* Fuckel	*Byssothecium* Fuckel			
Tetraplosphaeriaceae Kaz. Tanaka & K. Hiray.					*Byssolophis* Clem.
Pleosporales genus *incertae sedis*			*Macrovalsaria* Petr.	*Bactrodesmium* Cooke	*Homostegia* Fuckel
Tubeufiales Boonmee & K.D. Hyde					
Tubeufiaceae M.E. Barr	*Byssocallis* Syd.	*Byssocallis* Syd.			
Venturiales Y. Zhang ter, C.L. Schoch & K.D. Hyde					
Venturiaceae E. Müll. & Arx ex M.E. Barr	*Botryostroma* Höhn.	*Botryostroma* Höhn.			
Dothideomycetes, families *incertae sedis*					
Coccoideaceae Henn. ex Sacc. & D. Sacc.					*Englerodothis* Theiss. & Syd.
Dubujianaceae D. Pem, Doilom & K.D. Hyde, fam. nov.					*Dubujiana* D.R. Reynolds & G.S. Gilbert

Table 1 Continued.

Families/ Genera	Lumbsch & Hundorf (2007)	Lumbsch & Hundorf (2010)	Wijayawardene et al. (2014)	Wijayawardene et al. (2018)	This study
Endosporiaceae D. Pem, Doilom & K.D. Hyde, fam. nov.					*Endosporium* Tsuneda
Macrovalsariaceae D. Pem, Doilom & K.D Hyde, fam. nov.					*Macrovalsaria* Petr.
Micropeltidaceae Clem. & Shear	*Bonaria* Bat.	*Bonaria* Bat.			
Naetrocymbaceae Höhn.					*Bonaria* Bat.
Parmulariaceae E. Müll. & Arx ex	*Coccodothis* Theiss. & Syd. *Englerodothis* Theiss. & Syd.	*Coccodothis* Theiss. & Syd. *Englerodothis* Theiss. & Syd.			
Perisporiopsidaceae E. Müll. & Arx					*Asteronia* (Sacc.) P. Henn. *Byssocallis* Syd.
Pseudoperisporiaceae Toro	*Eumela* Syd.	*Eumela* Syd.	*Eumela* Syd.		
Vizellaceae H.J. Swart					*Acarella* Syd.
Dothideomycetes, genera *incertae sedis*	*Gibberidea* Fuckel *Homostegia* Fuckel *Hypobryon* Döbbeler *Belizeana* Kohlm. & Volkm. *Koordersiella* Höhn. *Macrovalsaria* Petr. *Didymocyrtidium* Vain. *Achorella* Theiss. & Syd. *Bryorella* Döbbeler *Cerodothis* Muthappa *Chionomyces* Deighton & Piroz. *Chuppia* Deighton	*Gibberidea* Fuckel *Homostegia* Fuckel *Hypobryon* Dobbeler *Belizeana* Kohlm. & Volkm. *Koordersiella* Hohn. *Macrovalsaria* Petr. *Didymocyrtidium* Vain. *Achorella* Theiss. & Syd. *Bryorella* Dobbeler *Cerodothis* Muthappa *Dermatodothis* Racib. ex Theiss. & Syd. *Gilletiella* Sacc. & P. Syd. *Harknessiella* Sacc. *Limaciniopsis* Mend.	*Hypobryon* Döbbeler *Dothidasteromella* Höhn. *Botryochora* Torrend *Byssolophis* Clem. *Dothivalsaria* Petr. *Bonaria* Bat. *Asteronia* (Sacc.) Henn. *Asterinema* Bat. & Gayão *Byssothecium* Fuckel *Byssocallis* Syd. *Coccodothis* Theiss. & Syd. *Englerodothis* Theiss. & Syd.	*Hypobryon Döbbeler* *Dothidasteromella* Höhn. *Botryochora* Torrend *Dothivalsaria* Petr. *Byssocallis* Syd. *Coccodothis* Theiss. & Syd. *Englerodothis* Theiss. & Syd. *Asteromassaria* Hohn. *Eumela* Syd. *Linopeltis* I. Hino & Katum. *Gibberidea* Fuckel *Homostegia* Fuckel	*Achorella* Theiss. & Syd. *Alascospora* Raja, Violi & Shearer *Anguillosporella* U. Braun *Asterinema* Bat. & Gayao *Asteromassaria* Höhn. *Asteromella* Pass. & Thüm. *Bactrodesmium* Cooke *Botryostroma* Höhn. *Bryorella* Döbbeler *Cerodothis* Muthappa

Table 1 Continued.

Families/ Genera	Lumbsch & Hundorf (2007)	Lumbsch & Hundorf (2010)	Wijayawardene et al. (2014)	Wijayawardene et al. (2018)	This study
	Dermatodothis Racib. ex Theiss. & Syd. *Excipulariopsis* P.M. Kirk & Spooner *Gilletiella* Sacc. & P. Syd. *Harknessiella* Sacc. *Limaciniopsis* J.M. Mend. *Kullhemia* P. Karst. *Bahusutrabeeja* Subram. & Bhat *Botryohypoxylon* Samuels & J.D. Rogers *Dilophospora* Desm. *Hassea* Zahlbr.	*Kullhemia* P. Karst. *Bahusutrabeeja* Subram. & Bhat *Botryohypoxylon* Samuels & J.D. Rogers	*Asteromassaria* Höhn. *Gibberidea* Fuckel *Homostegia* Fuckel *Belizeana* Kohlm. & Volkm.-Kohlm. *Koordersiella* Höhn. *Dothichiza* Lib. ex Roum. *Dianesea* Inácio & P.F. Cannon *Didymocyrtidium* Vain *Dubujiana* D.R. Reynolds & G.S. Gilbert *Acarella* Syd. *Achorella* Theiss. & Syd. *Alascospora* Raja et al. *Anguillosporella* U. Braun *Asteromella* Pass. & Thüm. *Bactrodesmium* Cooke *Bahusakala* Subram. *Bryorella* Döbbeler *Cerodothis* Muthappa *Chaetosticta* Petr. & Syd.	*Belizeana* Kohlm. & Volkm. *Koordersiella* Hohn. *Macrovalsaria* Petr. *Dothichiza* Lib. ex Roum. *Dianesea* Inacio & P.F. Cannon *Didymocyrtidium* Vain *Dubujiana* D.R. Reynolds & G.S. Gilbert *Achorella* Theiss. & Syd. *Asteromella* Pass. & Thum. *Bryorella* Dobbeler *Cerodothis* Muthappa *Chionomyces* Deighton & Piroz. *Chuppia* Deighton *Dermatodothis* Racib. ex Theiss. & Syd. *Endosporium* Tsuneda *Excipulariopsis* P.M. Kirk & Spooner *Gibbago* E.G. Simmons	*Chaetosticta* Petr. & Syd. *Chionomyces* Deighton & Piroz. *Chuppia* Deighton *Coccodothis* Theiss. & Syd. *Dermatodothis* Racib. ex Theiss. & Syd. *Dianesea* Inácio & P.F. Cannon *Didymocyrtidium* Vain. *Dothichiza* Lib. ex Roum. *Dothivalsaria* Petr. *Excipulariopsis* P.M. Kirk & Spooner *Gilletiella* Sacc. & P. Syd. *Harknessiella* Sacc. *Hypobryon* Döbbeler *Lignosphaeria* Boonmee, Thambug. & K.D. Hyde *Limaciniopsis* J.M. Mend.

Table 1 Continued.

Families/ Genera	Lumbsch & Hundorf (2007)	Lumbsch & Hundorf (2010)	Wijayawardene et al. (2014)	Wijayawardene et al. (2018)	This study
			Chionomyces Deighton & Piroz. *Chuppia* Deighton *Dermatodothis* Racib. ex Theiss. & Syd. *Endosporium* Tsuneda *Excipulariopsis* P.M. Kirk & Spooner *Gibbago* E.G. Simmon *Gilletiella* Sacc. & P. Syd. *Harknessiella* Sacc. *Limaciniopsis* J.M. Mend. *Kullhemia* P. Karst. *Bahusutrabeeja* Subram. & Bhat *Botryohypoxylon* Samuels & J.D. Rogers *Dilophospora* Desm. Hassea Zahlbr.	*Gilletiella* Sacc. & P. *Harknessiella* Sacc. *Lignosphaeria* Boonmee et al. *Limaciniopsis* Mend. *Kullhemia* P. Karst. *Botryohypoxylon* Samuels & J.D. Rogers *Dilophospora* Desm. *Hassea* Zahlbr.	*Linopeltis* I. Hino & Katum.
Ascomycota, families *incertae sedis*					
Strangosporaceae S. Stenroos, Miądl. & Lutzoni					*Kullhemia* P. Karst.
Ascomycota genera *incertae sedis*				*Acarella* Syd. *Botryostroma* Hohn.	
No mention of the genus in the outline	*Dianesea* Inácio & P.F. Cannon	*Chionomyces* Deighton & Piroz.	*Lignosphaeria* Boonmee, Thambug.	*Bahusakala* Subram. *Byssolophis* Clem.	

Table 1 Continued.

Families/ Genera	Lumbsch & Hundorf (2007)	Lumbsch & Hundorf (2010)	Wijayawardene et al. (2014)	Wijayawardene et al. (2018)	This study
	Dothichiza Lib. ex Roum. *Dubujiana* D.R. Reynolds & G.S. Gilbert *Acarella* Syd. *Alascospora* Raja, Violi & Shearer (was not yet published) *Anguillosporella* U. Braun *Asteromella* Pass. & Thüm. *Bactrodesmium* Cooke *Bahusakala* Subram. *Chaetosticta* Petr. & Syd. *Endosporium* Tsuneda (was not yet published) *Gibbago* E.G. Simmons *Lignosphaeria* Boonmee, Thambug. & K.D. Hyde (was not yet published)	*Chuppia* Deighton *Dianesea* Inácio & P.F. Cannon *Dothichiza* Lib. ex Roum. *Dubujiana* D.R. Reynolds & G.S. Gilbert *Acarella* Syd. *Alascospora* Raja, Violi & Shearer *Anguillosporella* U. Braun *Asteromella* Pass. & Thüm. *Bactrodesmium* Cooke *Bahusakala* Subram. *Chaetosticta* Petr. & Syd. *Endosporium* Tsuneda *Excipulariopsis* P.M. Kirk & Spooner *Gibbago* E.G. Simmons *Lignosphaeria* Boonmee, Thambug. & K.D. Hyde (was not yet published) *Dilophospora* Desm. *Hassea* Zahlbr.	& K.D. Hyde (was not yet published)	*Bonaria* Bat. *Asteronia* (Sacc.) P. Henn. *Asterinema* Bat. & Gayao *Byssothecium* Fuckel *Alascospora* Raja, Violi & Shearer *Bahusutrabeeja* Subram. & Bhat *Chaetosticta* Petr. & Syd.	
Sordariomycetes O.E. Erikss. & Winka					
Chaetothyriales, family *incertae sedis*					*Bahusutrabeeja* Subram. & Bhat

Table 1 Continued.

Families/ Genera	Lumbsch & Hundorf (2007)	Lumbsch & Hundorf (2010)	Wijayawardene et al. (2014)	Wijayawardene et al. (2018)	This study
Xylariales, genera *incertae sedis*					*Botryohypoxylon* Samuels & J.D. Rogers
Sporocadaceae Corda 1842					*Dilophospora* Desm.
Sordariomycetes genera *incertae sedis*					*Hassea* Zahlbr. *Bahusakala* Subram.

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