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Towards a natural classification of Dothideomycetes: The genera *Dermatodothella*, *Dothideopsella*, *Grandigallia*, *Hysteropeltella* and *Gloeodiscus* (Dothideomycetes *incertae sedis*)

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Abstract

One-hundred and sixteen genera are listed as *incertae sedis* in the class Dothideomycetes. This is a first of a series of papers in which we re-examine the herbarium types of these genera, which are generally poorly known. By examining the generic types we can suggest higher level placements, but more importantly we illustrate the taxa so that they are better understood. In this way the taxa can be recollected, sequenced and placed in a natural taxonomic framework in the Ascomycota. In this study we re-examined the genera *Dermatodothella*, *Dothideopsella*, *Gloeodiscus, Grandigallia* and *Hysteropeltella*. We re-describe and illustrate the type species of these genera and discuss their placements using modern concepts. *Dermatodothella* is placed in Polystomellaceae, *Dothideopsella* in Phaeosphaeriaceae, *Grandigallia* in Shiraiaceae and *Hysteropeltella* in Schizothyriaceae, while *Gloeodiscus* is retained in Dothideomycetes *incertae sedis*. Fresh collections of these genera are needed for further studies, so that they can be epitypified and molecular data can be analyzed to obtain a natural classification.

Key words: Ascomycota, *Dothideomycetes*, taxonomy, types

Introduction

Dothideomycetes are considered to be the largest and most diverse class in the Phylum Ascomycota (Hyde *et al*. 2013, Kirk *et al*. 2008) Most class members can be found as pathogens, endophytes or epiphytes of living plants, lichenized forms or as saprobes on decaying plant matter in leaf litter or dung (Schoch *et al*. 2006) Many, especially the asexual morphs, are agents of plant disease, causing serious problems to crop plants (Liu *et al*. 2012, Manamgoda *et al*. 2012, Wikee *et al*. 2011) The main defining characters of Dothideomycetes are the bitunicate, usually fissitunicate asci (Schoch *et al*. 2009, Hyde *et al*. 2013) Asci with similar ascus forms are also found in other orders and families e.g Trichomeriaceae, Chaetothyriaceae in Chaetothyriales (Chomnunti *et al*. 2011, 2012, Lumbsch and Lindemuth 2001) Several recent studies using multi-gene analysis and some coupled with morphology have provided the groundwork for classification in the Dothideomycetes (Liew *et al*. 2000, 2003, Schoch *et al*. 2009, Spatafora *et al*. 2006; Zhang *et al*. 2011, 2012) In the "Outline of Ascomycota—2009", Huhndorf and Lumbsch (2010) included two subclasses and eleven orders in the class Dothideomycetes, while placing two orders, 34 families and over 100 genera in Dothideomycetes *incertae sedis* because they could not be placed in any family or order with certainty.

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Parasitic on leaves in terrestrial habitats. *Ascomata* 170–190×120–140 µm ($\bar{x}$ = 180×125 µm, n = 10), solitary or scattered, semi-immersed or superficial, globose to subglobose, wall dark brown to black, coriaceous and spores released via a slit. *Peridium* 12–20 µm ($\bar{x}$ = 15 µm, n = 10) wide, comprising two layers, outer layer consisting of small, heavily pigmented, pseudoparenchymatous, dark brown cells, inner layer composed of wide, light brown cells of *textura angularis*. *Hamathecium* composed of dense, 2–4 µm diam ($\bar{x}$ = 3 µm, n = 10), hyaline, broad, cellular, septate pseudoparaphyses, anastomosing between asci. *Asci* 70–78×15–25 µm ($\bar{x}$ = 75×20 µm, n = 20), 8-spored, bitunicate, fissitunicate, ovoid to sub-cylindrical, with a short, broad pedicel, apically thickened and rounded with an ocular chamber. *Ascospores* 15–20×5–9 µm ($\bar{x}$ = 16×8 µm, n = 40) 2–3 overlapping seriate, cylindrical with narrowly rounded ends, hyaline, 4-septate, but breaking in to part spores, smooth-walled, thick-walled, without a sheath. *Asexual state*: unknown.

Notes: Berkeley (1855) introduced *Excipula nigrorufa* (basionym of *Gloeodiscus nigrorufus*) in the order Helotiales, and Dennis (1961) referred the genus to Dothideomycetes, genera *incertae sedis* and typified the genus with *Gloeodiscus nigrorufus*. This classification was followed by Lumbsch and Huhndorf (2010) *Gloeodiscus* is characterized by cellular pseudoparaphyses and asci with a furcate pedicel and 4-septate ascospores that easily break into part spores. The ascomata are single with a thick peridium of heavily pigmented, pseudoparenchymatous, dark brown cells. This combination of characters does not fit well in any Dothideomycete families and therefore we retain this genus in Dothideomycetes, genera *incertae sedis.* Morphology coupled with molecular data is essential to show the correct placement of this unusual genus.

Material examined: New Zealand, on leaf of *Pittosporum* sp., M.J. Berkeley (K 174632, holotype)

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