



The phylogenetic relationships of *Torrendiella* and *Hymenotorrendiella* gen. nov. within the Leotiomyces

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Abstract

Morphological and phylogenetic data are used to revise the genus *Torrendiella*. The type species, described from Europe, is retained within the *Rutstroemiaceae*. However, *Torrendiella* species reported from Australasia, southern South America and China were found to be phylogenetically distinct and have been recombined in the newly proposed genus *Hymenotorrendiella*. The *Hymenotorrendiella* species are distinguished morphologically from *Rutstroemia* in having a *Hymenoscyphus*-type rather than *Sclerotinia*-type ascus apex. *Zoellneria*, linked taxonomically to *Torrendiella* in the past, is genetically distinct and a synonym of *Chaetomella*.

Keywords: ascus apex, phylogeny, taxonomy, *Hymenoscyphus*, *Rutstroemiaceae*, *Sclerotiniaceae*, *Zoellneria*, *Chaetomella*

Introduction

Torrendiella was described by Boudier and Torrend (1911), based on *T. ciliata* Boudier in Boudier and Torrend (1911: 133), a species reported from leaves, and more rarely twigs, of *Rubus*, *Quercus* and *Laurus* from Spain, Portugal and the United Kingdom (Graddon 1979; Spooner 1987; Galán *et al.* 1993). Boudier & Torrend compared the fungus with *Dasyscypha* because of very long, brown, pointed setae at the apothecial margin. Later placed in the *Rutstroemiaceae*, the anatomical similarity of *T. ciliata* to *Rutstroemia* spp. was discussed by Galán *et al.* (1993) who argued that the presence of brown setae was likely to be of little phylogenetic significance and that *Torrendiella* should perhaps be placed in synonymy with *Rutstroemia*.

Dennis (1959b, 1978) suggested a possible relationship between *Rutstroemia hirsuta* Dennis (1959b: 460), or *Torrendiella ciliata*, respectively, and the type species of *Zoellneria*, *Z. rosarum* Velenovsky (1934: 298) (typified by Dennis 1959a), with both fungi characterised in part by brown setae on the apothecia and stromatic development on host tissue. Dennis (1958, 1963) and Beaton and Weste (1977) transferred four species with setose apothecia to *Zoellneria*. These species were later assigned to *Torrendiella* by Spooner (1987) who discussed differences between the type species of the two genera, differences he considered to be significant at the generic level. Johnston and Gamundi (2000) noted that although the outer part of the excipulum of *Z. rosarum* was gelatinised, it lacked the characteristic 3-layered excipulum structure of *Torrendiella* described by Galán *et al.* (1993), had nonamyloid asci, and an apparently consistent association with its putative anamorph, *Chaetomella oblonga* Fuckel (1870: 402) (Clark 1980, as *Amerosporium patellarioides* Smith & Ramsbottom (1918: 52), a synonym of *C. oblonga*, fide Rossman *et al.* 2004). Kirk *et al.* (2008) list *Amerosporium* as the anamorph of *Zoellneria*, based on the reported link between *A. patellarioides* and *Z. rosarum* (Clark 1980, Spooner 1987). Based on the synonymy of Rossman *et al.* (2004) the *Zoellneria* anamorph should in fact be recorded as *Chaetomella*.

From the Southern Hemisphere, *Torrendiella* was first reported by Spooner (1987), including three species previously treated by Dennis (1958) and Beaton and Weste (1977) as *Zoellneria*. Of these species, *T. madsenii* and *T.*

Ectal excipulum. The absence of a gelatinization of the ectal excipulum noted for *Torrendiella* s.l. (Spooner, 1987) was not confirmed for *Torrendiella ciliata* by Galán *et al.* (1993) or for *Hymenotorrendiella* by Johnston and Gamundi (2000). Also Graddon (1979) described the ectal excipulum of *T. ciliata* as “phialoid”, while he stated it to be thin-walled in the material he referred to *Rutstroemia rubi*. Although the genus *Hymenotorrendiella* is characterised in part by its three-layered ectal excipulum, the extent to which the various layers develop, and the extent of the gelatinisation of the central layer, varies markedly between species (Johnston and Gamundi 2000).

There is some discrepancy in the naming of the different excipular layers. Galán *et al.* (1993) referred to the three layers of the ectal excipulum as outer layer (oe), middle layer (me), and inner layer (ie). Johnston and Gamundi (2000) followed this terminology by naming the middle layer as “central layer”, and by using different acronyms (ec1, ec2, ec3) which are adopted in the present paper. Also Spooner (1987) described the ectal excipulum of *Poculum* as three-layered. Alternatively, the inner layer could be interpreted as an outer layer of the medullary excipulum. This alternative is supported when comparing the excipular anatomy of other members of sclerotiniaceous and helotiaceous fungi. The medullary excipulum is generally made up of a more or less loose *textura intricata*, while towards the ectal excipulum a *textura porrecta* is often found which is composed of similar hyphae. In sclerotiniaceous fungi these hyphae are often more pigmented and encrusted and also wider, whereas in helotiaceous taxa the difference to the inner layer lies mainly in a more compact and parallel orientation of the hyphae.

Stroma (pseudosclerotium). The leaf-inhabiting *Hymenotorrendiella* spp. are sometimes associated with stromatic lines on their host leaves, but not consistently so, and many specimens have no zone lines or other kinds of stromatic development. Many of the *Hymenotorrendiella* hosts are also associated with several other inoperculate discomycete species. It is possible that these latter species form stroma-like demarcation lines when they are present in adjacent areas on the same leaf. The wood and bark inhabiting species of *Hymenotorrendiella* are commonly associated with darkened tissue near the base of the apothecia, or more generally across the surrounding substrate. Within *Torrendiella*, a substratal stroma consisting of fine black lines that delimit irregular areas of the leaves is typical of *T. ciliata* (Graddon 1979, Spooner 1987) and *T. quintocentaria* (Galán *et al.* 1993). The late J.T. Palmer (unpubl. data) obtained stromata also in pure culture of *T. ciliata*.

The dark stroma was previously considered as characteristic of the *Sclerotiniaceae* s.l., but its taxonomic value at the family level is questioned through species today placed in *Hymenoscyphus* but previously in *Lanzia* or *Lambertella*, such as *Hymenoscyphus albidus* (Roberge ex Gillet) Phillips (1887: 138), *H. pseudoalbidus* Queloz *et al.* (2011: 140), *H. vacini* (Velen.) Baral & Weber in Weber (1992: 121), *H. serotinus* (Pers.) Phillips (1887: 125), and *H. berggrenii* (Cooke & W. Phillips) Kuntze (1898: 485), which form a black pseudosclerotial tissue on their host substrate and belong in the core *Hymenoscyphus* clade sensu Wang *et al.* (2006) (Zhao *et al.* 2013, Baral and Bemann 2013, Johnston and Park 2013).

Acknowledgements

The curator of the fungarium at Kew Gardens is thanked for allowing their specimens to be examined. The New Zealand Department of Conservation and the Victorian Department of Conservation and Natural Resources are thanked for allowing specimens to be collected in the national parks and reserves they administer. PRJ and DP were supported through the Landcare Research Systematics Portfolio, with Core funding support from the Science and Innovation Group of the New Zealand Ministry of Business, Innovation and Employment. We are thankful to Dr. Wen-Ying Zhuang for the re-examining the type material of *T. guangxiensis*, and to Michael Hairaud, Enrique Rubio, Demetrio Merino, and Javier Fernández, who have contributed by providing micro- and macrophotos of their collections.

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