



The *Bacidia coprodes* group (Ramalinaceae, Lecanoromycetes, Ascomycota), with special reference to the species in Europe and North America

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Abstract

This paper aims to clarify taxonomy and nomenclature of the lichen *Bacidia coprodes* and its closest relatives in Europe and North America. *Bacidia coprodes* as treated in recent works was found to consist of three distinct species in Europe and North America, the correct names of which are *B. coprodes* (s. str.), *B. notarisiana*, and *B. granosa*. In addition, a fourth species, *B. inornata* (Nyl.) Blomb. & Forssell, was found to be closely related to this group of lichens and is also treated here. The four species can be separated by apothecial and pycnidial pigmentation as well as conidium shape and size. They are closely related to species currently treated in *Bacidia*, *Toninia*, or *Arthrosporium*. Six basionyms, viz. *Bilimbia coprodes*, *Patellaria salevensis*, *Bilimbia subtrachona*, *Lecidea chytrina*, *L. chytrina* var. *hormospora*, and *L. inornata*, are lectotypified. Detailed descriptions and a determination key are provided.

Key words: *Toninia*, *Bacidia trachona*, *Bacidia subcoprodes*, *Bacidia chrysocolla*, *Bacidia clavigera*, *Bilimbia intercedens*, *Bacidia verecundula*, *Catillaria aphana*, *Fellhaneropsis*.

Introduction

When Körber first described *Bilimbia coprodes* for a crustose lichen with black apothecia, brown hypothecium, green epihymenium, and 3-septate ascospores (Arnold 1858), he also noted the remarkable similarity with *B. notarisiana* A. Massal., which had been validly described a few years earlier (Massalongo 1855). In a later treatment, Körber provided a more detailed morphological assessment of *B. coprodes* and clearly distinguished between this lichen and *Biatora trachona* (Ach.) Körb. (originally described as *Verrucaria trachona* Ach.), another lichen with superficially similar morphological characteristics (Körber 1860). Although *B. trachona* always seems to form conspicuous pycnidia, it seldom produces apothecia. However, rare observations of apothecia (e.g., Körber 1855; Zwackh-Holzhausen 1883; Arnold 1884) seem to have caused confusion and led Stizenberger (1868) to unite the two species under the name *Lecidea trachona* (Ach.) Nyl. This collective treatment was followed by most authors for a very long period of time, one notable exception being Lettau (1912), who listed them as separate species and also transferred them to *Bacidia* in accordance with the artificial generic circumscription suggested by Zahlbruckner (1905). *Bacidia coprodes* consequently fell into disuse as a mere synonym of *B. trachona* until Llop & Ekman (2007) pointed out the distinction between them and that they even belong in different families, *B. trachona* in the Pilocarpaceae and *B. coprodes* in the Ramalinaceae. Meanwhile, several additional names of lichens related to *Bacidia coprodes* were published, starting with *Patellaria salevensis* (Müller Argoviensis 1862), soon synonymized with *Lecidea trachona* by Stizenberger (1868), and ending with *Bilimbia pammellii* (Hedrick 1934).

Although *Bacidia coprodes* was recently resurrected and discussed by Llop & Ekman (2007), that treatment did not address the full extent of the taxonomical challenges in the group and was fraught with nomenclatural shortcomings that need attention. The Antarctic material was later investigated by Olech & Czarnota (2009), who recognized two species, *B. subcoprodes* Olech & Czarnota and *B. chrysocolla* Olech *et al.* The purpose of this paper is to further clarify taxonomy and nomenclature of the European and North American members of the *Bacidia coprodes* group and discuss their relationships.

- with mixture of green and red-brown pigment *B. granosa*
- Areoles warted, never becoming effigurate or microsquamulose; prothallus absent; pycnidial wall with red-brown pigment only *B. notarisiana*
- 6. Squamules with irregular pale flecks; upper part of hymenium with green pigment only *T. aromatica* (incl. *T. fusispora*)
- Squamules without irregular pale flecks; upper part of hymenium dominated by red-brown pigment *T. verrucarioides*

Additional names

The following observations were made on types of three names that I came across during the course of this revision.

Bilimbia clavigera Zahlbruckner (1903: 180)

Bacidia clavigera (Zahlbr.) Zahlbruckner (1926a: 107). Type: CROATIA. Split-Dalmatia: Hvar, “Insel Lesina, am Wege von Lesina nach Cittavecchia, an Kalkfelsen”, November 1902, *J. Lütkemüller* (W!).

Zahlbruckner (1903) considered his new species to be closely related to *Bacidia coprodes*. The type material in W, from the island Hvar off the Dalmatian coast in Croatia, is probably *Toninia aromatica* with a poorly developed thallus consisting of scattered small whitish squamules.

Bilimbia trachona var. *intercedens* Arnold (1873: 505)

Bilimbia intercedens (Arnold) Arnold (1877: 570). *Bacidia trachona* var. *intercedens* (Arnold) Zahlbruckner (1926b: 209). Type: AUSTRIA. Tirol: “*Larix*-Rinde, Waldrast in Tirol”, August 1872, *F. Arnold* (UPS L-664328!).

Original material could not be located in M. The type specimen in UPS was probably sent from Arnold to T. M. Fries. This specimen was labelled “*Bilimbia* --/n. sp” and annotated “a me adhuc denominanda” (= “should still be named by me”) by Arnold, and surely represents the taxon later described as *Bilimbia trachona* var. *intercedens* Arnold. This taxon was the only taxon in *Bilimbia* described as new from the area in question, and the locality data fully agree with the material discussed in detail by Arnold (1873: 511–512). The type material of *Bilimbia trachona* var. *intercedens* in UPS belongs to *Bacidia verecundula* (Th. Fr.) H. Magn., which was originally described as *Bilimbia verecundula* Th. Fries (1874: 387). Note that Arnold (1877), when combining his taxon to species level, put forward the idea of a close relationship with *Bacidia verecundula*, possibly after having communicated with Fries on the matter. Also note that *Patellaria intercedens* Müll. Arg., on which *Bacidia intercedens* (Müll. Arg.) Zahlbr. is based, is a different taxon.

Bilimbia subcoprodes de Lesd. in Crozals (1924: 107)

Bacidia subcoprodes (de Lesd.) Zahlbruckner (1932: 409). Type: FRANCE. Provence-Alpes-Côte d’Azur: Var, “Giens”, February 1924, *A. de Crozals* (US 01138555!).

The type material in US is *Catillaria aphanus* (Nyl.) Coppins. Most ascospores are 1-septate, although some are non-septate and some 3-septate. This variation in ascospore septation is often observed in that species.

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