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Dendrothele rajchenbergii sp. nov. (Agaricales, Basidiomycota) and other corticioid fungi from tabaquillo forests in Central Argentina

Dendrothele rajchenbergii sp. nov. (Agaricales, Basidiomycota) y otros hongos corticioides de los bosques de tabaquillo del centro de Argentina

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ABSTRACT

The aim of this work is to contribute to the knowledge of the diversity of corticioid fungi growing in *Polylepis australis* forests of Central Argentina. *Dendrothele rajchenbergii* is a new species described based on morphological features. This species is morphologically similar to *D. pachysterigmata* from Canada and to *D. minima* from Europe. Some other corticioid fungi species growing on tabaquillo forests are also reported.

Keywords — Crust fungi; *Polylepis*; South America.

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RESUMEN

El objetivo de este trabajo es contribuir al conocimiento de la diversidad de hongos corticioides que crecen en los bosques de *Polylepis australis* en el centro de Argentina. Se describe una nueva especie, *Dendrothele rajchenbergii*, con base en características morfológicas. La especie está morfológicamente relacionada con *D. pachysterigmata* de Canadá y con *D. minima* de Europa. Se reportan también algunas otras especies de hongos corticioides que crecen en los bosques de tabaquillo.

Palabras clave — Hongos resupinados; *Polylepis*; Sudamérica.

INTRODUCTION

Polylepis australis Bitter (Rosaceae) is an endemic tree restricted to Central Argentina that forms forest colloquially known as 'tabaquillo forests'. Tabaquillo forests have been degraded by human intervention and are currently in clear regression, being one of the most threatened ecosystems in the world. These forests have historically been subjected to cattle raising, fire and wood extraction. Consequently, they have been restricted to ravines and surrounded by different types of grassland. However, *Polylepis australis* forests contain numerous endemisms of flora and funga, and this type of study helps to highlight the importance of the conservation of these interesting ecosystems (Gallo *et al*., 2015; Rajchenberg & Robledo, 2005; Robledo *et al*., 2006; Robledo & Renison, 2010).

The objective of this work is to contribute to the knowledge of the diversity of corticioid fungi growing associated to *Polylepis australis*, describing a new species of *Dendrothele* and reporting other funga associated to these particular forests.

MATERIALS AND METHODS

For light microscopic studies, samples were mounted in 3% potassium hydroxide (KOH), Melzer's reagent (IKI), and 0.1% cotton blue in 60% lactic acid to establish cyanophily of basidiospores. Line drawings were made with a camera lucida attachment. Collector acronyms are referred to Gerardo Robledo (GR) and Ana Laura Gallo (ALG). Specimens are deposited in CORD and SALA-Fungi.

TAXONOMY

Dendrothele rajchenbergii A.L.Gallo, Robledo & Gorjón, **sp. nov.**
MycoBank 844377

Diagnosis.— The species is characterized by resupinate, white to cream, smooth basidiomata, short clavate basidia with four stout sterigmata, ellipsoid basidiospores measuring (8.5-)9-10(-11) × 5-5.5 μm, and by the occurrence in a mature tabaquillo forest.

Type.— ARGENTINA. Prov. Córdoba, Los Gigantes, Sierras de Córdoba, La Quebrada de Anselmo, 31°23'42"S 64°48'56"W, 1839 m snm, 25-V-2008, on bark of dead branch of mature *Polylepis australis* forest, *A. L. Gallo 952* (SALA, holotype).

Etymology.— *rajchenbergii*: Named in honor of Dr. Mario Rajchenberg (Argentina), in recognition of his contributions to the taxonomy of South American corticioid fungi.

Description.— Basidiomata resupinate, at first growing in small patches, then effused, white to cream when dry, margin abrupt, indistinct, hymenophore smooth (Fig. 1). Hyphal system monomitic, hyphae tortuous, with small clamps difficult to discern, thin-walled, 2-3 μm in diam., hyaline. Hyphidia apically branched or knobby but not distinctly branched like dendrohyphae, not encrusted. Crystals abundant in the subhymenium. Hymenium a palisade of basidia and hyphidia. Cystidia, gloeocystidia and other sterile elements absent, but some young basidia or basidioles may be interpreted as moniliform or constricted cystidia. Basidia short clavate, irregular, usually with several constrictions and long stalked, 20-30 × 8-10 μm, with four stout short sterigmata, basally clamped. Basidiospores ellipsoid, (8.5-)9-10(-11) × 5-5.5 μm, smooth, firm to slightly thick-walled, hyaline, IKI–, cyanophilous (Fig. 2).

Habitat and substrate.— Growing on bark of small twigs, in mature forest known as 'tabaquillo' forests.

Known distribution.— Known only from the type locality in Central Argentina.

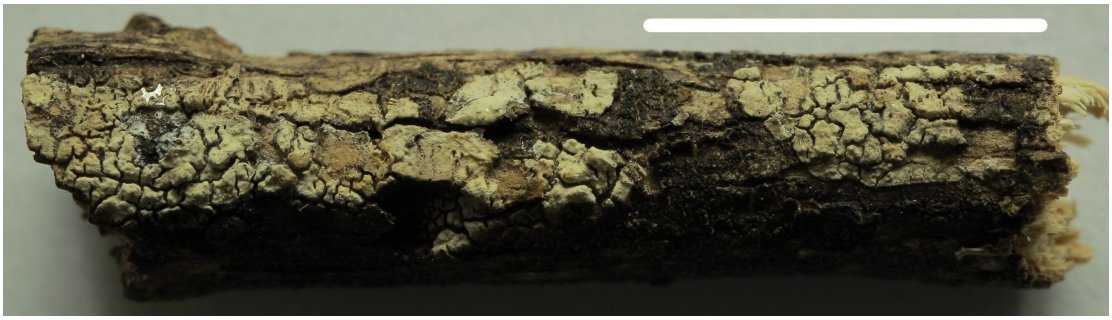

Fig. 1. *Dendrothele rajchenbergii* (ALG 952, holotype). Basidiome. Bar 1 cm.
Fig. 1. *Dendrothele rajchenbergii* (ALG 952, holotipo). Basidioma. Barra 1 cm.

RESULTS AND DISCUSSION

The genus *Dendrothele* Höhn. & Litsch. comprises about 50 species, most described and exclusively recorded from the Northern Hemisphere. *Dendrothele* includes species with discoid or crustose basidiomata occurring on bark of living trees and shrubs, with only few species known from fallen wood. Microscopically, it is characterized by the abundant dendrohyphidia and crystalline deposits, an adaptation to drought and exposure, large basidia, and variably shaped basidiospores, in some cases slightly thick-walled and cyanophilous. There are several worldwide taxonomic studies of the genus (*e.g.*, Lemke, 1964; Boidin *et al*., 1996; Gorjón & Bernicchia, 2010; Nakasone & Burdsall, 2011), but only a few that focus on South America (Greslebin & Rajchenberg, 1998; Gorjón *et al*., 2011; Gorjón & de Jesús, 2012; Rodrigues & Guerrero,

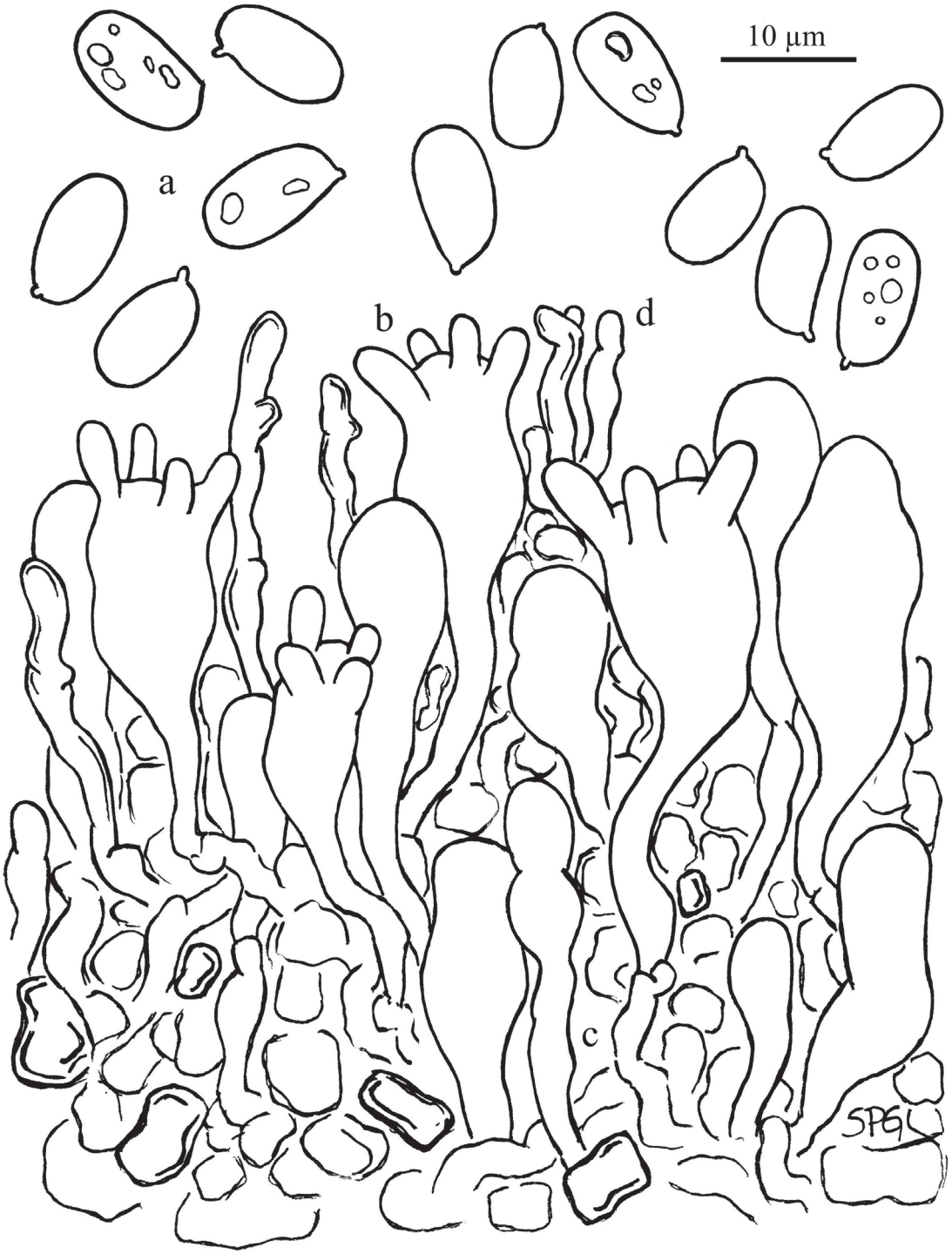

Fig. 2. *Dendrothele rajchenbergii* (ALG 952, holotype). Microscopical elements. A) Basidiospores. B) Basidia. C) Clamped hyphae. D) Hyphidia.

Fig. 2. *Dendrothele rajchenbergii* (ALG 952, holotipo). Elementos microscópicos. A) Basidiosporas. B) Basidios. C) Hifas fibuladas. D) Hifidios.

2012). *Dendrothele* is a polyphyletic genus (Goranova *et al*., 2003; Bodensteiner *et al*., 2004), and the generic type, *Dendrothele papillosa* Höhn. & Litsch. [= *D. griseocana* (Bres.) Bourdot & Galzin], is included in the Lachnellaceae Boud. (Niaceae Jülich)

within the Agaricales Underw., closely related to such cyphelloid genera as *Lachnella* Fr. and *Cyphellopsis* Donk.

Dendrothele rajchenbergii is closely related to a group of *Dendrothele* species with stalked basidia with short and stout sterigmata and ellipsoid basidiospores. *Dendrothele pachysterigmata* (H. S. Jacks. & P. A. Lemke) P. A. Lemke, is only known from Ontario, Canada, growing on corticate twigs and branches, occasionally bare wood, of *Thuja occidentalis* L. (Cupressaceae); it has slightly larger, thick-walled basidiospores (9.5-)10-11(-12) × (5-)5.5-6.5(-7) μm, with basidia with (2-)3-4 sterigmata (Nakasone, 2009). *Dendrothele minima* Duhem, is similar but its basidiospores are slightly smaller, 7-9 × 4.5-5.5 μm, and its distribution is so far restricted to France and Switzerland growing on *Robinia pseudoacacia* L. (Fabaceae), *Diospyros kaki* L. (Ebenaceae), and *Taxus baccata* L. (Taxaceae) (Duhem & Michel, 2007). *Dendrothele lemkei* Gresl. & Rajchenb. also possess stalked basidia and ellipsoid basidiospores, but they are considerably larger 12-16 × 8-10 μm, and the species is restricted to grow on fallen wood of *Nothofagus pumilio* (Poepp. & Endl.) Krasser (Nothofagaceae) in Patagonia (Greslebin & Rajchenberg, 1998).

Unfortunately, we have not been able to obtain sequences for *D. rajchenbergii*, but there is also no molecular information for *D. pachysterigmata* or *D. minima*. It would be very appropriate to compare these species from a phylogenetic and phylogeographic perspective to establish possible relationships and, if applicable, history of geographic dispersion.

The endemic species *Aleurocystis gloeocystidiata* Rajchenb. & Robledo (Rajchenberg & Robledo, 2005) and some other 20 corticioid species were previously reported from the *Polylepis australis* Argentinean forests (Gallo *et al*., 2015). From the examination of additional collections in the same study area, we can also report the following species of corticioid fungi to complete the knowledge of fungal species associated to *Polylepis australis*: *Botryobasidium isabellinum* (Fr.) D.P. Rogers, *Coniophora puteana* (Schumach.) P. Karst., *Dendrophora albobadia* (Schwein.) Chamuris, *Hyphodontia alutaria* (Burt) J. Erikss., *Phanerochaete sordida* (P. Karst.) J. Erikss. & Ryvarden, *Phanerochaete tuberculata* (P. Karst.) Parmasto, *Radulomyces confluens* (Fr.) M.P. Christ., *Trechispora farinacea* (Pers.) Liberta, and *Xylodon crustosus* (Pers.) Chevall.

Specimens studied.— ARGENTINA. Prov. Córdoba, Quebrada del Tigre, 32°00'42"S 64°57'3"W, 1737 m snm: ***Dendrophora albobadia*** (*GR 647*, 10-IV-2005, on dead branches of *P. australis*); ***Hyphodontia alutaria*** (*GR 656*, 10-IV-2005, on dead branches of *P. australis*); ***Radulomyces confluens*** (*GR 663*, 17-VIII-2003, on dead branches of *P. australis*, without bark). Prov. Córdoba, Los Gigantes, Sierras de Córdoba, La Quebrada de Anselmo, 31°23'42"S 64°48'56"W, 1839 m snm: ***Phanerochaete sordida*** (*ALG 832*, 07-II- 2008, on dead branches of *P. australis*); ***Phanerochaete tuberculata*** (*ALG 932*, 25-V- 2008, on dead branches). Prov. Córdoba, Los Molles, El Hueco, 31°58'20"S 64°56'45"W, 1920 m snm: ***Botryobasidium isabellinum*** (*ALG 203*, 31-III-2007, on dead branches); ***Coniophora puteana*** (*GR 374*, 22-XII-2004, on bark of *P. australis*); ***Dendrophora albobadia*** (*ALG 209*, 31-III-2007, on dead branches); ***Hyphodontia alutaria*** (*ALG 198*, 207, 31-III-2007, on dead branches); ***Radulomyces confluens*** (*ALG 205*, 31-III-2007, on dead branches); ***Trechispora farinacea*** (*ALG*

202, 31-III-2007, on dead branches); ***Xylodon crustosus*** (*ALG* 204, 31-III-2007, on dead branches).

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