
A review of Spegazzini taxa of *Periconia* and *Sporocybe* after over 115 years

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Some groups or genera described by Spegazzini have never been re-examined. In this paper the type material of *Sporocybe* and *Periconia* species described by Spegazzini are studied. The genus *Periconia* is represented in Argentina by seven species: *P. bromeliicola*, *P. byssoides*, *P. circinata*, *P. lateralis*, *P. minutissima*, *P. spegazzinii* and *P. tirupatiensis*. Among Spegazzini's holotypes of *Sporocybe*, *S. bromeliicola* is considered a *nomen dubium*, *S. antarctica* is a lichen, *S. chlorocephala* is a synonym of *Stromatographium stromaticum*, *Sporocybe penicillata* is a synonym of *Melanographium spinulosum* and *S. sacchari* is a synonym of *Doratomyces purpureofuscus*. *Doratomyces* is represented by four species: *D. asperulus*, *D. microsporus*, *D. purpureofuscus* and *D. stemonitis*, three of which are reported under this genus for the first time.

Key words: Argentina, *Dematiaceae*, *Doratomyces*, hyphomycetes

Introduction

During early botanic description in South America, between 1879 and 1926, Carlos Spegazzini, described and identified *ca.* 4000 species of fungi. This was an enormous contribution to Mycology in Argentina, considering that only 39 species were recognised from Argentina before his exhaustive work. His collections are deposited in the Herbarium LPS at the "Instituto de Botánica Carlos Spegazzini", La Plata, Buenos Aires Province.

Some groups or genera described by Spegazzini have been re-examined, eg. Heinemann (1962) studied the types of the genus *Agaricus*; Carmarán (2002) the *Diatrypaceae*, Hladki and Romero (2001) studied *Kretzschmaria* species from Argentina, Lindquist and Wright (1959) studied the identity of *Poroniopsis* and *Hypocreodendron*. and Rajchenberg and Wright (1987) studied Spegazzini's types of *Corticaceae* and *Polyporaceae*. We present the

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results of a study on Spegazzini material of *Periconia* and *Sporocybe* in the light of modern classification systems.

In 1791 H.J. Tode proposed the genus *Periconia* in his *Fungi Mecklenburgenses Selecti*, fasc. 2, p. 2. The genus has been studied by various authors (Mason and Ellis, 1953; Ellis, 1971, 1976; Saikia and Sarbhoy, 1982; Muntañola, Cvetković *et al.*, 1998, 1999) and currently comprises 39 species. *Periconia* species are temperate and tropical in their distribution and occur on rotting vegetation in terrestrial (Romero, 1983, 1994; Photita *et al.*, 2001; Yanna *et al.*, 2002), freshwater (Cai *et al.*, 2002), mangrove (Alias and Jones, 2000; Sarma and Vittal, 2000) and marine (Morrison-Gardiner, 2002) habitats. They are also plant pathogens and endophytes (Romero *et al.*, 2001).

According to Ellis (1971), *Periconia* includes species with macronematous conidiophores mostly with a stipe and spherical head, which branches are present or absent. Conidiogenous cells are monoblastic or polyblastic, discrete on stipe and branched. Conidia are catenate, usually spherical or subspherical, pale to dark brown, verruculose or echinulate, without septa. The type species is *Periconia lichenoides* Tode ex Mérat. They are anamorphic ascomycetes.

In Argentina, Spegazzini (1910) described *P. laevispora* as a new species, and later, Romero (1983, 1994), contributed new reports for the genus. Fries (1925) proposed *Sporocybe* as a new genus and described it as follows: "Receptaculum subulatum, stipitifforme terminatum capitulo farinaceo sporidiifero, floccis destituto." The name *Sporocybe byssoides* Fr. was formally published by Fries (1832). Spegazzini (1882, 1887, 1896, 1922, 1926) later described five species within this genus.

Following a detailed analysis of the description of *S. byssoides*, Mason and Ellis (1953) considered *Sporocybe* to be a synonym of *Periconia*, because it had been based on *P. byssoides*.

This paper provides information on the Spegazzini material and an update on the taxonomic position of his *Periconia* and *Sporocybe* species. The representation of the genus *Periconia* and a key of the known species in Argentina is given. Some of the Spegazzini material studied in the present paper belongs to the genus *Doratomyces*, so its representation in Argentina was also studied. Corda (1829) proposed *Doratomyces*, while Morton and Smith (1963) provided an amended and complete diagnosis of the genus.

Materials and methods

Specimens from BAFC and LPS were studied (herbarium abbreviations follow Holmgren *et al.*, 1990). Observations and measurements were taken

from material, which was re-hydrated using tap water and/or KOH 5%, and then squash-mounted in floxine. The drawings were made using a camera lucida.

Results and discussion

Examination of the Spegazzini collections

Periconia laevispora Speg.

This fungus was collected by Spegazzini (1910) in the Buenos Aires Province. Unfortunately it was impossible to observe the upper section of the conidiophores and the conidiogenous cells. From Spegazzini's drawings (Figs 1, 2), and our observation of the conidiophores (Fig. 3) and the conidia (Figs 3, 6), it is possible to relate this species to *P. minutissima* Corda. However, due to the presence of a basal stromata, a character not found in *P. minutissima*, and the minute verruculose conidia we consider it to be a good species. Taking into account the poor condition of this unique specimen, an epitypification of the species is required.

Periconia spegazzinii Sacc., Syll. Fung. 22: 1350. 1913.

= *P. laevispora* Speg., An. Mus. Nac. Buenos Aires 20 (ser. 3, v. 13): 431, 1910. non Lindau, 1906.

Stroma 30-40 µm diam., formed by pseudoparenchymatic, small, dark brown, to brown, stromatic cells, each 5-9 µm wide. *Conidiophores* mononematous, macronematous, erect, straight, septate, smooth-walled, brown to dark brown, 500-2000 µm long × 8-10 µm wide; micronematous conidiophores not observed. Each conidiophore ends in a single spherical head of conidia (50-90 µm). *Conidiogenous cells* discrete, terminal, situated on pale brown, apical branches. *Conidia* in acropetal branched chains, dry, spherical, verruculose, aseptate, pale brown to brown, 4-6 µm diam.

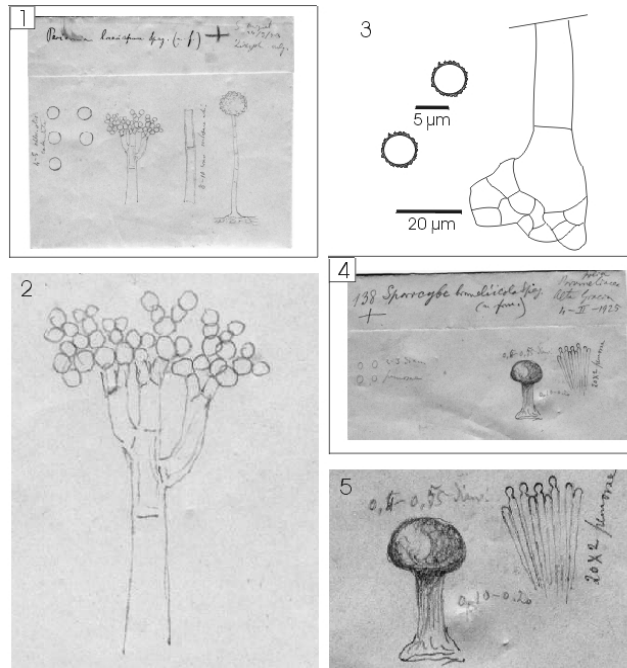
Material examined: ARGENTINA, Buenos Aires, San Miguel, on decaying petioles of *Zizyphus vulgaris*, March 1903, C. Spegazzini (LPS 2136 – **holotype** of *P. laevispora*).

Saccardo (1913) proposed *P. spegazzinii* Sacc. for *P. laevispora* Speg., because this name was a later homonym of *P. laevispora* Lindau.

Sporocybe antarctica Speg.

Spegazzini collected this organism in Tierra del Fuego. Following examination of type material we consider that this specimen is a lichen. For this reason, *Sporocybe antarctica* should be regarded as a *nomen dubium*.

Material examined: ARGENTINA, Tierra del Fuego, Cabo Negro, on *Fagus antarctica*, 1882, C. Spegazzini (LPS 33139 – **holotype** of *S. antarctica*).



Figs 1-2. Spegazzini's drawing of *Periconia sp.* Note the conidiophore ending in a spherical head, the conidiogenous cells arising in terminal branches and the spherical, pale and aseptate conidia. **Fig. 3.** Conidiophore, basal stromata and verruculose conidia of *Periconia sp.* **Figs 4-5.** Spegazzini's drawing of *Sporocybe bromeliicola*. Note the conidiophore, the conidiogenous cells and the elliptic-globose conidia.

Sporocybe bromeliicola Speg.

Unfortunately, the specimen on which this species was based consists of only few pieces of bark without any conidiophores. From Spegazzini's drawings (Figs 4, 5), it seems to be a synnemata. It is impossible to ascertain the morphology of this taxon and *Sporocybe bromeliicola* should be regarded as a *nomen dubium*.

Sporocybe bromeliicola Speg., Bol. Acad. Nac. Cienc. Córdoba 29 (2/3): 183. 1926.

Spegazzini description transcribed textually: "Maculae arescentes sordide fusco-cinereae, epiphyllae, determinatae; stipites errumpenti-superficiales, cylindrici coriacelli, breviusculi, sordide fusci, capitulo subgloboso duplo latiore terminati; hyphae dense constipatae tenues fumosae, apice rotundatae monosporae; conidia elliptico-globosa minuta laevia fumosa."

Material examined: ARGENTINA, Córdoba, Alta Gracia, on leaves of indet. Bromeliaceous host, 4 February 1925, C. Brunch (LPS 33140 – **holotype** of *S. bromeliicola*).

Sporocybe chlorocephala Speg.

Seifert (1987) reviewed the type material of *S. chlorocephala* and considered this species to be a synonym of *Stromatographium stromaticum* (Berk.) Höhn. This fungus is classified as:

Stromatographium stromaticum (Berk.) Höhn., Denk. Akad. Wien 83: 37. 1907.

≡ *Stilbum stromaticum* Berk., London J. Bot. 10: 642. 1843.

= *Botryonipha stromatica* (Berk.) O. Kuntze, Rev. Gen. Plant. 2: 845. 1891.

= *Sphaerostilbe wrightii* Berk. and Curt., J. Linn. Soc. Bot. 10: 377. 1869. (1868) (nomen anamorphosum).

= *Sporocybe chlorocephala* Speg., An. Soc. Cient. Argent. 13: 31. 1882. fide Seifert, 1987.

Material examined: ARGENTINA, Buenos Aires, Recoleta, on decaying trunk of *Salix humboldtiana* Willd., 8 May 1881, C. Spegazzini (LPS 33141 – **holotype** of *S. chlorocephala*).

Sporocybe penicillata Speg.

Unfortunately this specimen is in poor condition. Conidia are verruculose, straight, obovate or limoniform, 15-20 × 10-11 µm, brown to dark brown, with a germ slit (Fig. 7). Stromata are immersed, dark brown. Conidiophores are macronematous in loose to moderately dense, erect fascicles. It was impossible to observe the upper section of conidiophores and conidiogenous cells. Through these observations and the Spegazzini's drawings, we conclude that this taxa could belong to the genus *Melanographium*. This genus is represented in Argentina by *M. spinulosum* (Speg.) Hughes and *M. cokeii* Ellis (Romero and Carmaran, 1997). Both *M. spinulosum* and *Sporocybe penicillata* have the same conidia and conidiophore morphology. Taking into account the morphology and the fact that material of this fungi is from Paraguay, we consider that *S. penicillata* is a synonym of *M. spinulosum*.

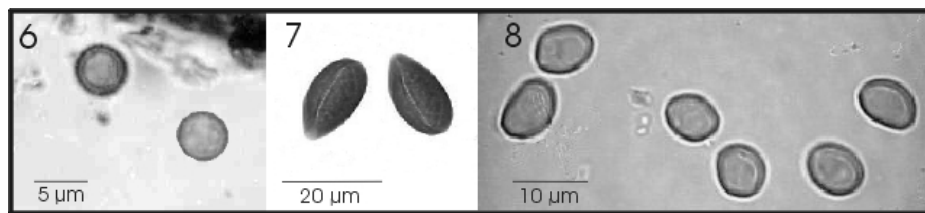


Fig. 6. Conidia of *Periconia spegazzinii*. **Fig. 7.** Conidia of *Melanographium spinulosum* (= *Sporocybe penicillata*), verruculose, dark brown with a germ slit. **Fig. 8.** Conidia of *Doratomyces purpureofuscus* (= *Sporocybe sacchari*), oblong, smooth and aseptate.

Melanographium spinulosum (Speg.) Hughes, *Canad. J. Bot.* 36: 783. 1958.

= *Sporocybe penicillata* Speg., *An. Mus. Nac. Hist. Nat. Buenos Aires* 31: 444; pl. 23, fig. 259. 1922.

For other synonyms see Hughes (1958).

Material examined: PARAGUAY, Asunción, on a branch of *Seguiera paraguayensis*, July 1919, C. Spegazzini (LPS 33124 – **holotype** of *S. penicillata*); *ibid.*, Guarapí, 1881, B. Balansa (no. 2796), (LPS 1001 – **holotype** of *Cordella spinulosa* Speg.); *ibid.*, Calle-poi y Yaguaron, on rot leaves of *Laurinea* fide packets (*Lauraceae?*), 20 September 1887, B. Balansa (no. 4002), (LPS 12926 – **holotype** of *Cordella tomentosa* Speg.).

Sporocybe sacchari Speg.

Conidiophores macronematous, synnematos, dark brown, mostly smooth, branched to the apex forming sphaerical heads, 70-80 µm diam. Conidia ovoid to oblong, smooth, aseptate, brown, 3.5-4.5 × 5.5-7.5 µm (Fig. 8). The material is very poor and unfortunately it was not possible to recognize percurrance in the conidiogenous cells.

We conclude that *S. sacchari* is not a *Periconia*, but is very similar to *Graphium pistillarioides* Speg. (1896). Seifet studied this material and considered that it was a synonym of *Doratomyces microsporus* (Sacc.) Morton & Smith, but he never formally published it. However, the conidia shape and size differ between these two taxa. In our opinion *S. sacchari* conidia are more similar to those of *Doratomyces purpureofuscus* (Fries) Morton & Smith. For this reason a new synonym is proposed.

Doratomyces purpureofuscus (Fr.) Morton & Smith, *Mycol. Pap.* 86: 74-77. 1963.

≡ *Sporocybe sacchari* Speg., *Rev. Fac. Agron. Vet. La Plata* 2 (18): 253. 1896.

Material examined: ARGENTINA, Buenos Aires, La Plata, on leaves, sheaths, and culms of *Saccharum officinarum*, 1894, C. Spegazzini (LPS 33143 – **holotype** of *S. sacchari*); *ibid.*, Tucumán, on leaves of *S. officinarum*, April 1894, C. Spegazzini (LPS 33137 – **holotype** of *Graphium sacchari*); *ibid.*, 23 Sept. 1894, C. Spegazzini (LPS 33136 – **holotype** of *G. pistillarioides*).

Periconia pycnospora Speg.

This taxon was reported by Spegazzini from Argentina (Spegazzini, 1898, 1913) and from Chile (Spegazzini, 1910b) on various substrates. *Periconia pycnospora* is a synonym of *P. byssoides* (Mason and Ellis, 1953). Recently it was reported on *Geoffroea decorticans* (Bianchinotti, 1998) and on *Tabebuia avellanadae* (López, pers. com.). This fungus is classified as:

Periconia byssoides Pers. ex Mérat

Description, synonyms and illustrations in Mason and Ellis (1953)

Material examined: ARGENTINA, Buenos Aires, Santa Catalina, on *Ailanthus glandulosa*, 11 March 1890, C. Spegazzini (LPS 12976); *ibid.*, Buenos Aires, La Plata, on *Bohemeriae candidissima*, August 1911, C. Spegazzini (LPS 12977); *ibid.*, on *Vitis vinifera*, 25 November 1906, C. Spegazzini (LPS 12978); CHILE, Valdivia, on *Digitalis?* sp., January 1909, C. Spegazzini (LPS 12979); *ibid.*, Victoria, on *Lauralia* sp. fide packets (*Laureceae?*), November 1922, C. Spegazzini (LPS 12975).

Other *Periconia* species reported from Argentina

Romero (1983, 1994) contributed to the genus *Periconia* in Argentina. During a study of xylophilous micromycetes on *Eucalyptus viminalis* Labill. she described and illustrated *Periconia tirupatiensis* Subram., *Periconia circinata* (Mangin) Sacc., *Periconia minutissima* Corda and *Periconia lateralis* Ellis and Everh., and also isolated *P. circinata* (Romero, 1983).

It is also worthwhile to mention the description of *Palaeopericonia fritzschii* Ibáñez & Zamuner. The studied material represents the first fossil record related to *Periconia* and the oldest record, up to that date, of the fossilized *Dematiaceae* (Ibáñez and Zamuner, 1996).

***Doratomyces* reported from Argentina**

In Argentina, *Doratomyces* is represented by four species. Three are reported from Argentina for the first time here.

Doratomyces purpureofuscus (Fr.) Morton & Smith, Mycol. Pap. 86: 74. 1963.

≡ *Sporocybe sacchari* Speg., Rev. Fac. Agron. Vet. La Plata 2 (18): 253. 1896.

Doratomyces microsporus (Sacc.) Morton & Smith, Mycol. Pap., 86: 77. 1963.

≡ *Graphium pistillarioides* Speg., Rev. Fac. Agron. Vet. La Plata, 2 (18): 254. 1896.

Doratomyces asperulus Wright & Marchand, Bol. Soc. Bot. Arg. 24: 307. (1972).

Described by Wright and Marchand from soil from Buenos Aires.

Doratomyces stemonitis (Pers. & Fr.) Morton & Smith, Mycol. Pap. 86: 70. 1963.

Identified by J.E. Wright on roots of *Vitis vinifera* but never published. It is interesting to mention that we have not found any previous report of these species neither on *Saccharum officinarum* nor *Vitis vinifera*.

Additional material examined: ARGENTINA, Mendoza, Capital, on roots of *Vitis vinifera*, 14 March 1939, Ruiz Leal, det. J.E. Wright (BAFC- 51.230).

Key to species of *Periconia* from Argentina

1. Conidiophores in large groups with the stipes closely adpressed, conidia 5-7.5 µm diam.
..... *P. tirupatiensis*
1. Conidiophores widely scattered 2
2. Conidia formed unilaterally below the sterile, setiform apex *P. lateralis*
2. Conidia in a well-defined, fairly compact head at the apex of the stipe..... 3
3. Conidiophores circinate at the apex *P. circinata*
3. Conidiophores not circinate at the apex 4
4. Conidia 10-15 µm diam. *P. byssoides*
4. Conidia 4-6 µm diam. 5
5. No stromata formed, conidiophores up to 550 µm long often swollen at the base, conidia straw-coloured to pale brown, verruculose *P. minutissima*
5. Stromata formed, conidiophores 500-2000 µm long, conidia pale brown to brown, verruculose..... *P. spegazzinii*

Key to species of *Doratomyces* from Argentina modified from Ellis (1971)

1. Conidia slightly rough..... *D. asperulus*
1. Conidia smooth 2
2. Conidia 3-5 × 2-3 µm..... *D. microsporus*
2. Conidia mostly larger than 5 × 3.5 µm 3
3. Heads ellipsoidal or cylindrical, conidia often pointed at apex; usually with an *Echinobotryum* state..... *D. stemonitis*
3. Heads spherical or sub spherical, conidia mostly rounded at apex; no *Echinobotryum* state
..... *D. purpureofuscus*

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