



## ***Phillipsia olivacea*: an uncommon Neotropical discomycete discovered in the Brazilian semiarid**

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### **Abstract**

*Phillipsia olivacea* is an uncommon discomycete record from Brazil. It was described originally from South Brazil and later recorded from Central America and northern South America. Now it is found for the first time from a montane forest in the Brazilian semiarid region. Description, discussion, photography of the ascomata and drawings are provided.

**Key words** – Ascomycota – Neotropic – Pezizomycetes – Sarcoscyphaceae – taxonomy

### **Introduction**

*Phillipsia* Berk. is a genus with at least 17 known species from Central and South America, Africa, Asia and Australia (Ekanayaka et al. 2017). In the protologue, it was described with thick and firm context, wide cupuliform-discoid cupule and hymenium always opened, and included six species previously included in *Peziza* (Berkeley 1881). The most comprehensive studies about the *Phillipsia* were performed by Denison (1969), Hansen et al. (1999) and more recently Ekanayaka et al. (2017), who defined to this genus all the discomycetes with bright colored apothecia that frequently grow in dead woods, the suboperculate asci and the thin and poorly differentiated outer exipulum from the medullary exipulum.

Some species are reported or described from Africa and Asia (e.g., Kalchbrenner & Cooke 1880, Moravek 1997, Zhuang 2003, Wang 2012, Ekanayaka et al. 2017). In Neotropic the following taxa are known: *P. carminea* (Pat.) Le Gal, *P. costaricensis* Denison, *P. crispata* (Berk. & M.A. Curtis) Le Gal, *P. domingensis* (Berk.) Berk., *P. lutea* Denison, *P. gigantea* Seaver, *P. guatemalensis* Paden and *P. olivacea* (Rick 1931, Seaver 1942, Denison 1969, Paden 1977, Hansen et al. 1999, Calonge et al. 2006, Angelini & Medardi 2012, Oliveira et al. 2013).

Continuing studies on macrofungi from the State of Paraíba, Brazil, an interesting discomycete was discovered in a montane forest ('brejo de altitude') from the Brazilian semi arid region that corresponds a new finding to Caatinga biome.

### **Materials & Methods**

*Phillipsia* ascomata were collected in a 'brejo de altitude' forest called Mata do Pau-Ferro. The characterization of the area was already summarized by Sá & Wartchow (2016). Microscopic observations were made from material mounted in 3% KOH, Congo red solution and Melzer's reagent. The material is deposited at JPB (Thiers, continuously updated).

## Results

*Phillipsia olivacea* Rick, Brotéria, Ser. Bot. 26: 357. 1931.

Figs 1–5

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Apothecia up to 25 mm in diam., 10 mm high when fresh, sub-stipitate with short stipe about 5 mm long and 2 mm wide, shallowly cup shape to disc-shaped, uniformly greenish-olivaceous then brownish in dried state, receptacle convex, lower side dirty white to creamy when fresh, coriaceous but more tougher in dried state.

*Ascospores* (26–) 26.5–32.5 (–33.2) × (8.2–) 9.2–12.8 (–13.3) µm ( $x = 28.8 \times 11.2$  µm,  $n = 30$ ), uniseriate, ellipsoidal to reniform, with rounded or slightly apiculate apices, guttulate, hyaline, thin walled, smooth in MO. Asci 215–275 × 11–16 (–21) µm ( $x = 232 \times 14$  µm,  $n = 20$ ), long stipitate, cylindrical, colorless, suboperculate, 8-spored. Paraphyses 2.4–4.6 µm ( $x = 3.4$  µm,  $n = 20$ ) wide, abundant among the asci, filiform, septate, sometimes with orange granules. Subhymenium composed of gelatinized cells of *textura intricata* with interwoven hyphae 4–6 µm wide. Ectal excipulum 90–150 µm thick at lower flanks, composed of loosely arranged cells of *textura prismatica* with hyphae 5–15 µm wide. Medullary excipulum 0.5–1 mm thick, composed of plentiful, intensely interwoven arranged thin-walled hyphae of *textura intricata* 4–7 µm wide.

Known distribution – Brazil (Rio Grande do Sul, Paraíba, Paraná and Santa Catarina), Costa Rica, Ecuador and Venezuela.

Habit – on rotten wood in a montane forest in the Brazilian semiarid.

Material examined – Brazil, Paraíba, Areia, Parque Estadual Mata do Pau-Ferro, Trilha do Cumbe, 17 July 2017, F. Wartchow 60/2013 (JPB 63853).



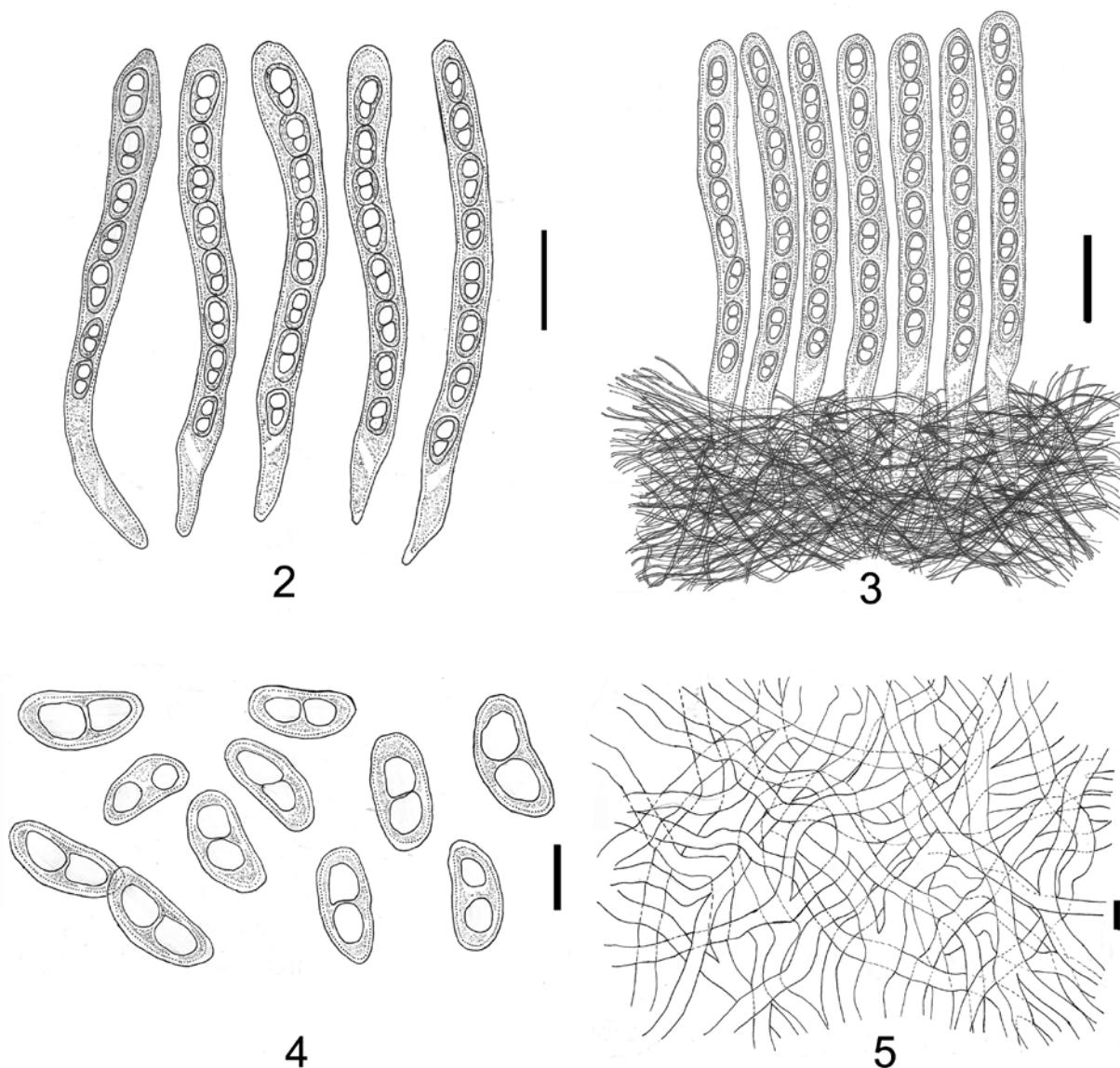
**Fig 1** – *Phillipsia olivacea*. 1 Apotecia. Scale Bar = 10 mm.

## Discussion

*Phillipsia olivacea* is characterized macroscopically by the small, cupulate to discoid apothecia, sometimes bearing small stipe, and the greenish olivaceous hymenium. Microscopically, the 8-spored asci and the elliptic reniform ascospores lacking striations and smooth under light microscope measuring (26–) 26.5–32.5 (–33.2) × (8.2–) 9.2–12.8 (–13.3) µm also help to characterize the species. Two microscopic features we need attention: the smaller asci and the ascospore surface. Regarding to smooth basidiospore wall observed here, it corroborates with

Hansen et al. (1999: 307) on which they are reported as smooth under light microscope. The most interesting surprise was regarded in the size of the asci. Hansen et al. (1999: 306) reported longer ones  $400\text{--}480 \times 14\text{--}16 \mu\text{m}$  in the lectotype of *P. olivacea* analysed by them. On the other hand our collection presented only  $215\text{--}275 \times 11\text{--}16\text{--}21 \mu\text{m}$ . During examination we found many asci which did not release their ascospores. We suspect that the shorter asci in our collection is due the material was not sufficiently mature. We need explain here that we measured the asci from the very base of the structure. Thus, although the shorter asci, all other features of our collection agree with *P. olivacea* described by Hansen et al. (1999) and Calonge et al. (2006).

Originally known from Rio Grande do Sul, South Brazil (Rick 1931), it was later reported from Paraná and Santa Catarina, and also Costa Rica, Ecuador and Venezuela (Denison 1969, Hansen et al. 1999, Calonge et al. 2006).



**Figs 2–5 –** *Phillipsia olivacea*. 2 Asci. 3 Asci and the subhymenial hyphae of the *textura intricata*. 4 Ascospores. 5 Hyphae of the *textura intrincata* of the *medullary excipulum*. Scale Bars = 10  $\mu\text{m}$ .

The discovery of *P. rugosospora* by Paden (1977) from Costa Rica was referred with yellow hymenium, but later synonymized with *P. olivacea* by Hansen et al. (1999) who extended the description of the species for the ones with yellow, dull orange and light brown hymenium.

Calonge et al. (2006) rediscovered the species from Costa Rica and cited the hymenium with variable color, from greenish yellow, grayish green, olive green then dark green.

Differently from *P. olivacea*, other species can be easily separated by the apotecial hymenium color. Ekanayaka et al. (2017) provided a complete table of 17 species of *Phillipsia* known to date. However, all other species have distant hymenium color as pink (e.g., *P. hartmannii*), coral red [e.g., *P. umbilicata* (Penz. & Sacc.) Boedjin], orange [e.g., *P. crenulata* (Sacc.) Le Gal], rosaceous tan (e.g., *P. guatemalensis* Paden), tan (e.g., *P. costaricensis* Denison) or even white (e.g., *P. ranomafanensis* J. Moravec). In addition, although other collections of *P. olivacea* varying from pale yellow to olive brown, the non-striate and smooth ascospores (smooth to wrinkled under SEM according to Hansen et al. 1999: 307) are distinguished (Hansen et al. 1999).

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