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Short Communication

Gymnopilus ianthinilophus (Agaricales, Basidiomycota), a new species from the Brazilian Amazon

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Abstract

Gymnopilus is an agaricoid genus of mostly wood-rotting mushrooms, with ca. 200 species worldwide distributed, of which 23 of them are currently known in Brazil. In the Amazon region, *Gymnopilus* taxa correspond mostly to very old names described under *Agaricus*, later recombined into *Gymnopilus*, such as *G. marasmioides*, *G. panurensis*, *G. psamminus*, and *G. trailii.* Based on the examination of a well-annotated exsiccate at the INPA Herbarium, *Gymnopilus ianthinilophus* is described as a new species. It is characterized by the densely cespitose habit, squarrose pileus with blackish brown squamules, adnate to subdeccurent lamellae with decurrent tooth, violaceous brown stipe, weakly dextrinoid basidiospores 7.6–9.2 × 5.1–6.1 µm, interwoven pileus trama, lageniform with capitate or subcapitate apex cheilocystidia measuring 15.3–25.5 × 5.6–8.2 µm, and absence of pleurocystidia and caulocystidia. Description, photographs, illustrations of the new species, and discussion and comparison with morphologically similar taxa are provided.

Key words: Agaricomycetes, Fungi, Hymenogastraceae, Neotropics, taxonomy.

Resumo

Gymnopilus é um gênero agaricoide comumente lignícolas que possui cerca de 200 espécies distribuídas pelo mundo, onde 23 são conhecidas no Brasil. Na região amazônica, *Gymnopilus* corresponde principalmente a antigos registros sob o gênero *Agaricus*, os quais foram recombinados em *Gymnopilus*, como *G. marasmioides*, *G. panurensis*, *G. psamminus* e *G. trailii.* Após análise de exsicatas, *G. ianthinilophus* é descrito como uma nova espécie. Caracterizada por seu hábito densamente cespitoso, píleo esquarroso de escamas marrom-escuras, lamela adnata a subdecurrente com dentes decurrente, estipe violeta-acastanhado, esporos fracamente dextrinoides 7,6–9,2 × 5,1–6,1 µm, trama do píleo com hifas entrelaçadas queilocistídios lageniformes com ápice capitado ou subcapitado medindo 15,3–25,5 × 5,6–8,2 µm e ausência de pleurocistídios e caulocistídios. São apresentadas descrição, fotografias e ilustrações da nova espécie, discutidas e comparadas com espécies morfologicamente similares.

Palavras-chave: Agaricomycetes, Fungi, Hymenogastraceae, Neotrópicos, taxonomia.

Gymnopilus P. Karst. is a genus of mostly lignicolous agaricoid mushrooms with about 200 mainly lignicolous species (He *et al.* 2019; Wijayawardene *et al.* 2020), of which 23 are known in Brazil (Fabrini & Wartchow 2020; Fabrini *et al.* 2022). From the Amazon region, the following *Gymnopilus* taxa were reported: *G. marasmioides* (Berk.) Singer, *G. panurensis* (Berk.) Pegler, *G. psamminus* (Berk.) Pegler, and *G. trailii* (Berk. & Cooke) Singer (Berkeley 1856; Berkeley & Cooke 1877; Singer 1965; Pegler 1988).

Following our investigations of *Gymnopilus* in Brazil (*e.g.*, Silva-Junior & Wartchow 2015; Fabrini & Wartchow 2020; Fabrini *et al.* 2022), we begun to analyze exsiccates of *Gymnopilus* included in the unpublished thesis made by Aguiar

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(1984) and deposited in the INPA Herbarium (Thiers, continuously updated). One of them corresponds to an interesting material provisionally named as "*Gymnopilus violaceus* I.J. Araújo ined." (Aguiar 1984) growing caespitose on a decayed trunk in the Amazon forest, and is formally described here as *Gymnopilus ianthinilophus*.

Thus, this report emphasizes in the importance of inventories in biological collections, as such herbaria, that are important source of knowledge of the biological diversity (Peixoto & Morim 2003).

Macroscopic description was taken from the unpublished thesis made by Aguiar (1984) and some few direct observations on the exsiccate. Microscopic observations were made from material mounted in 3% KOH, Melzer's reagent, and Congo red; and observation on pileus trama were made after transversal sections (Hesler 1969). Description of the basidiospores follows the methodology proposed by Tulloss *et al.* (1992), slightly modified here. Statistics are based on 25 measured basidiospores. Abbreviations include L(W) = average basidiospores length (width), Q = length / width ratio range as determined from all measured basidiospores, and Qm = Q value averaged from all basidiospores measured. The holotype is deposited at INPA herbarium (Thiers, continuously updated).

Gymnopilus iantinilophus Fabrini & Wartchow, sp. nov. Type: Brazil, Amazonas, Estrada Manaus-Caracaraí, km 41, 25.IV.1980, A. Webber s/n (INPA 122241 as '*Gymnopilus violaceus*', holotypus hic designatus).

MycoBank no.: MB 843222. Figs. 1-4

The species is characterized by the densely cespitose basidiomata, squarrose pileus with blackish brown squamules, adnate to subdeccurent lamellae with decurrent tooth, violaceous brown stipe, weakly dextrinoid basidiospores measuring 7.6–9.2 × 5.1–6.1 µm, interwoven pileus trama, cheilocystidia 15.3–25.5 × 5.6–8.2 µm, lageniform with capitate or subcapitate apex, and pleurocystidia and caulocystidia absent.

Basidiomata small sized, densely cespitose in a tuft with 10 basidiomata. Pileus 13–34 mm in diam., convex; surface squarrose, glabrous toward margin; ferruginous then centrally darker due the blackish brown squamules, with glossy spaces between the squamules; margin entire, non-sulcate nor striate (seen in dried specimens); context thin, up to 1.5 mm thick at centre (measured in the exsiccate). Lamellae adnate to subdecurrent with decurrent tooth, very wide, close, ferruginous; lamellulae frequent, with diverse lengths (observed in the exsicatum). Stipe 15–25 × 2–6 mm, subequal to slightly wider toward base, violaceous brown,

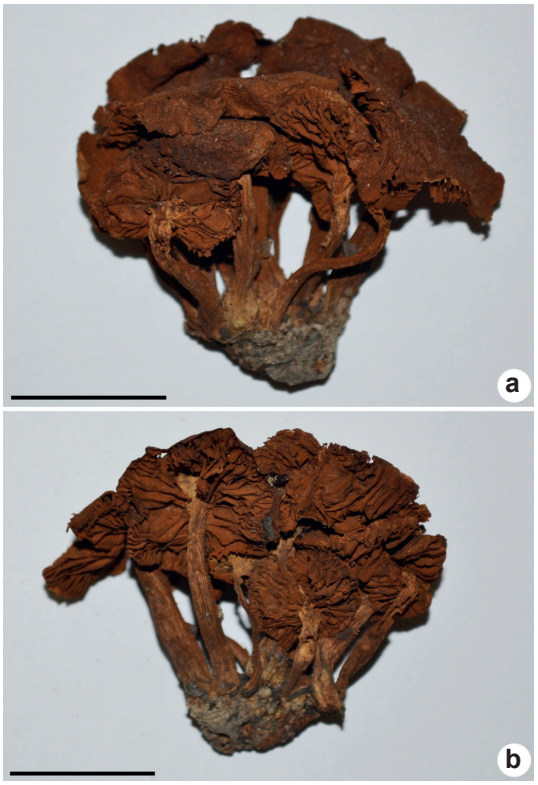

Figure 1 – a-b. *Gymnopilus ianthinilophus* (holotype) – basidiomes (scale bar = 10 mm).

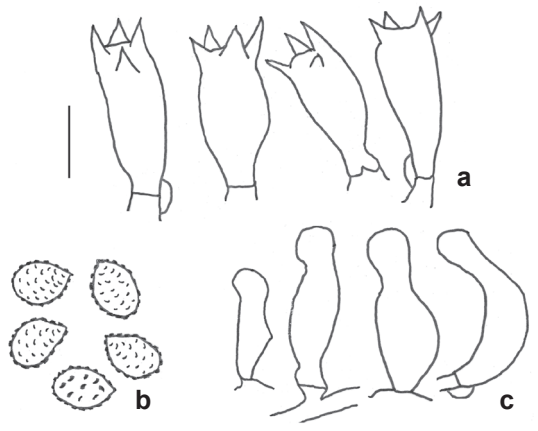

Figure 2 – a-c. *Gymnopilus ianthinilophus* (holotype) – a. basidia; b. basidiospores; c. cheilocystidia (scale bar = 10 µm).

glabrescent; veil absent.

Basidiospores 7.6–9.2 × 5.1–6.1 µm (L = 8.4 µm, W = 5.7 µm, Q = 1.33–1.54 (–1.70), Qm = 1.48), ellipsoid, few widely ellipsoid or elongate, yellowish brown in KOH, weakly dextrinoid, adaxial surface slightly convex, wall verrucose; moderately thick-walled (0.4 µm thick), without germ-pore; hilar appendix small. Basidia 17.3–21 × 6.1–9.2 µm, clavate, hyaline. Pleurocystidia absent. Lamellae edge sterile, with crowded cheilocystidia. Cheilocystidia 15.3–25.5 × 5.6–8.2 µm, lageniform with capitate or subcapitate apex, hyaline, thin walled. Lamellae trama regular, composed by hyaline or pale yellowish hyphae 2–5.5 µm wide. Pileus trama unsatisfactorily rehydrated but distinctly interwoven, with hyaline

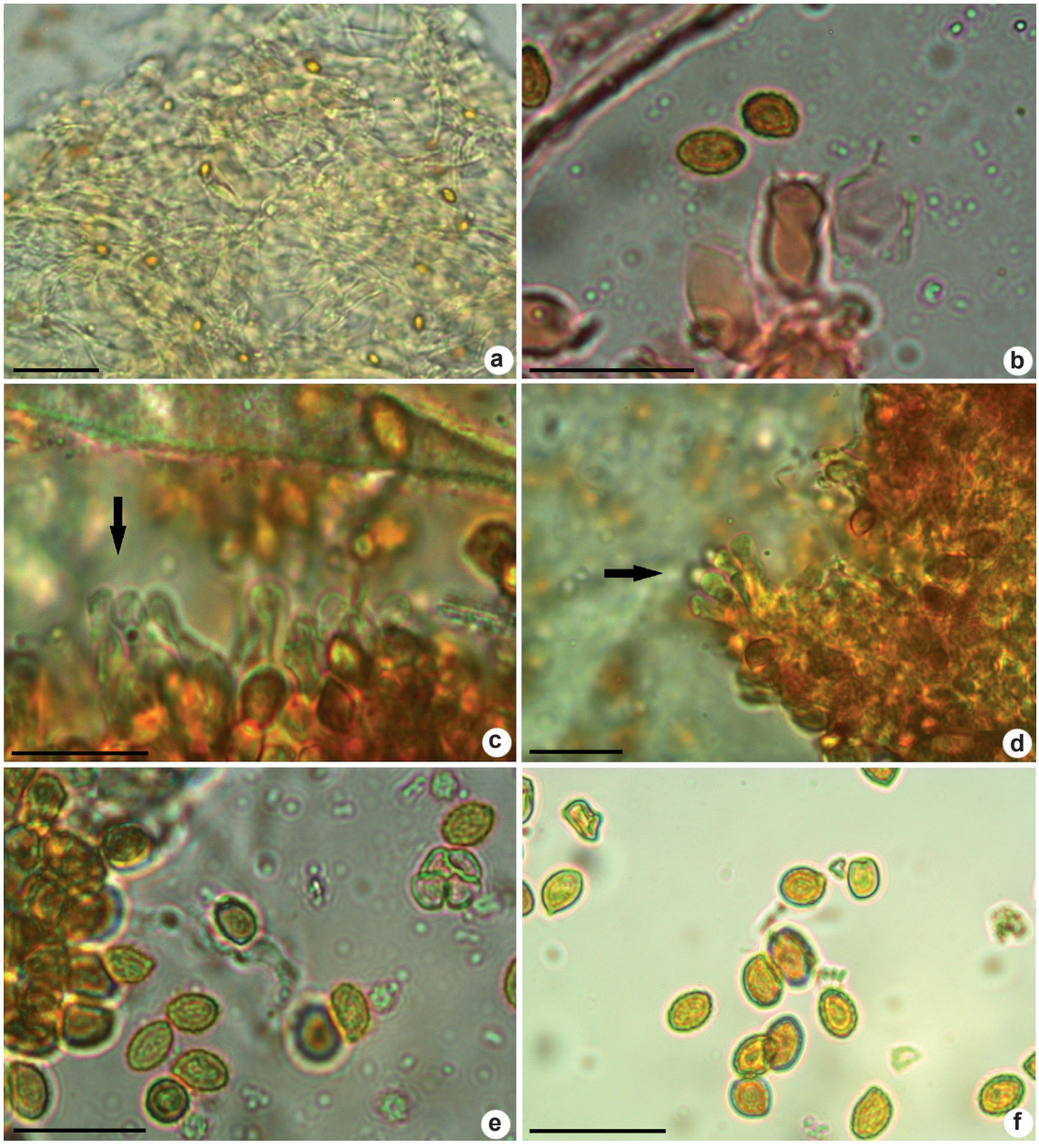

Figure 3 – a-f. *Gymnopilus ianthinilophus* (holotype) – a. pileus trama showing the interwoven construction in KOH 3% solution; b. basidium and basidiospores in KOH 3% and Congo red solution; c-d. cheilocystidia in KOH 3% solution (black arrows); e. basidiospores in KOH 3% solution; f. basidiospores with weak dextrinoid reaction.

to pale yellowish thin-walled hyphae. Pileipellis a differentiated cutis, composed up by yellowish, parallel to subparallel hyphae, with terminal cells 6–11 µm wide, thin-walled; pileocystidia absent. Caulocystidia absent. Clamp connections present in hymenium, but difficult to observe.

The species is densely cespitose on a dicotyledon trunk. And is know only from the type locality. The etymology is from Gr. 'ianthinus' (= violet) and 'lophus' (= tuft). Due the new species is disposed as a dense tuft of many basidiomata with violet stipe.

This species was originally described as "*G. violaceus* Araújo ined." in the unpublished thesis of Aguiar (1984), due the violet stipe. In addition, the epithet chosen by us also emphasizes the cespitose habit of the basidiomata. In the original description, Aguiar (1984) reported dextrinoid basidiospores, but in our analysis, the weak Melzer's reaction was observed after approximately 24 hours.

According to Hesler (1969), the new species can be assigned to sect. *Gymnopilus* s.auct. in the account of the ringless stipe, and basidiospores mostly ranging (6–)7–9 µm long. Following Hesler's (1969: 51–53) key, the dextrinoid basidiospores, fibrillose ranging to scaly pileus, lignicolous basidiomes not larger than 50 mm in diam., and absence of veil put our species keyed with *G. picreus sensu* Hesler, *G. aurantiacus* Hesler, and *G. fuscosquamulosus* Hesler. However, *G. aurantiacus* and *G. fuscosquamulosus*, although sharing the interwoven pileus trama, readily differ in the non-violaceous stipe, and the presence of pleurocystidia (Hesler 1969).

Species with dark colored stipe are not common in *Gymnopilus*. *Gymnopilus picreus* (Pers.) P. Karst., *G. picreus sensu* Hesler, *G. marasmioides*, and *G. russipes* Pegler are the only few known species, so far:

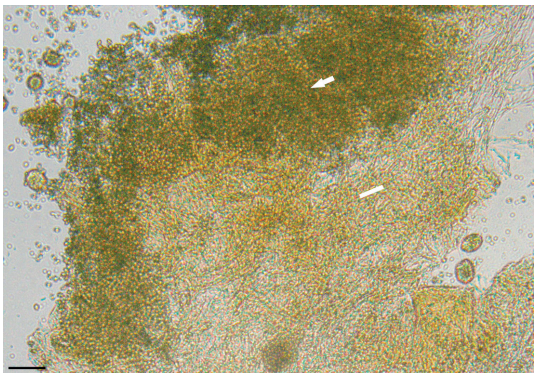

Figure 4 – *Gymnopilus ianthinilophus* (holotype) – pileipellis (white arrow), and interwoven pileus trama (white line).

The North American specimens of *G. picreus sensu* Hesler somewhat agree in the ornamented pileus centre, and also share in the subdecurrent lamellae and the pigmented stipe. However, *G. picreus sensu* Hesler differs in the 'subsquamulose' pileus with moist and hygrophanous surface, umber to fulvous stipe, radial pileus trama, and the presence of ventricose pleurocystidia and clavate pileocystidia (Hesler 1969).

Actually, *G. picreus sensu stricto* was originally described from Northern Europe protologued as having "umbrino" (*i.e.*, umber, brown according to Stern 1985) stipe, glabrous cinnamon pileus, and emarginate-adnexed lamellae (Persoon 1798, as *Agaricus picreus* Pers.). Bon & Roux (2002: 40), on the other hand, described the pileus surface as "matt and entirely pruinose". Later, Holec (2005) included more accurate data about this European entity as the orange-brown, red-brown to reddish rusty brown and glabrous (but finely ornamented under lens) pileus, emarginate lamellae, dark rusty brown to umber brown with red or violet tinge stipe, only slightly dextrinoid basidiospores (8–)8.5–10.5(–10.8) × (5.2–)5.5–6.5 µm, and absence of pleurocystidia, although Bon & Roux (2002) reported non-capitate pleurocystidia in French specimens.

In the Brazilian Amazon, *G. marasmioides* might be a somewhat similar species. It was originally described with tawny pulverulent subconic pileus, emarginate to adnate lamellae, and deep brown stipe (Berkeley 1856, as *Agaricus marasmioides* Berk.). Later, it was redescribed in detail by Singer (1965), who reported as growing in fasciculate tuft, but with tawny subglabrous and minutely sulcate pileus in dried state with a distinct papila, adnate to emarginate lamellae, and exannulate rusty stipe with deep brown base when dry. Microscopically, the basidiospores are similar to *G. ianthinolophus* in size measuring 6–9 × 4.8–6.5 µm, but the species presents pleurocystidia. Subsequent type study by Pegler (1988) also reported basidiospores 7–9 × 4–5.6 (7.5 ± 0.4 × 5.2 ± 0.3) µm, and numerous subcylindric to lageniform pleurocystidia. Thus, the presence of pleurocystidia in *G. marasmioides* can be readily used for segregating this taxon from *G. ianthinilophus*.

Finally, *G. russipes* was reported as very common growing in large numbers on rotten

wood in the islands of Martinique and Guadeloupe (Pegler 1983). This species was described with a reddish brown stipe, a feature that can be somewhat similar to the violaceus brown stipe of *G. ianthinilophus*, as well as the absence of veil and of pleurocystidia. However, *G. russipes* differs at least in the larger, up to 60 mm in diam., pileus, with minute apressed fibrillose surface, and wider basidiospores 8–10 × 6–7.5 µm, L = 9 µm; W = 6.5 µm; Qm = 1.34 (Pegler 1983).

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