



Annotated checklist of *Gymnopilus* from Brazil

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Abstract

A checklist of species belonging to the genus *Gymnopilus* in Brazil is provided. The list, which includes all species recorded in Brazil prior to 2017, cites 22 species. Brief descriptions, distribution notes, and references are provided.

Key words – Agaricales – Agaricomycetes – Neotropic – taxonomy

Introduction

Historically *Gymnopilus* P. Karst. has been treated as member of *Cortinariaceae* by Singer (1986) or *Strophariaceae* by Kühner (1984) and Guzmán-Dávalos et al. (2003). Recent molecular studies included the genus in Hymenogastrales, but with low support (Matheny et al. 2015). In Brazil, the earliest records of this genus were performed during 19th century with Montagne (1856) and Berkeley & Cooke (1877). The genus was already treated in previous checklists, on which Putzke (1994) reported 15 and more recently Capelari et al. (2015) 11 species.

In this paper, we present an annotated checklist of *Gymnopilus* reported from Brazil, providing respective references and data on basidiospores and habitat.

Materials & Methods

The checklist was based on a survey of scientific papers and books that cite taxa of *Gymnopilus* from Brazil. The information retrieved from the literature includes: distribution records per Brazilian state, notes about general habitat and substrates, basidiospore measurements and shapes. For the distribution data, the Brazilian state is listed first followed by the city or other locality information.

Genera and species are listed alphabetically and the authorities for the binomials, as well as the author names spellings, are in according to Robert et al. (2005) and Anonymous (2019) databases.

Results

***Gymnopilus arenicola* Hesler**

Distribution – São Paulo (Pegler 1997), Mato Grosso do Sul (Bononi et al. 2017).

Habitat – Growing on sandy soil (Pegler 1997).

Note – According to Hesler (1969), it presents pileus 15–30 mm in diam., smooth or finely fibrillose, orange to near brownish yellow surface; lamellae adnate to slightly adnexed; veil absent; basidiospores $7\text{--}8 \times 3.5\text{--}4.5 \mu\text{m}$, ellipsoid to slightly pip-shaped; pleurocystidia $20\text{--}27 \times 4\text{--}5 \mu\text{m}$, ventricose; cheilocystidia $15\text{--}28 \times 3\text{--}7 \mu\text{m}$, ventricose to flask-shaped, apex subcapitate or capitate.

***Gymnopilus cf. bakeri* Dennis**

Distribution – Paraná (De Meijer 2006).

Habitat – On bark of fallen trunk (Dennis 1970).

Note – According Dennis (1970), *Gymnopilus bakeri* presents pileus 10–20 mm in diam., conic-convex; lamellae adnexed, subdistant, brown; veil none; basidiospores $6\text{--}7 \times 4\text{--}5 \mu\text{m}$, ellipsoid, pleurocystidia not mentioned (probably absent); cheilocystidia $25\text{--}30 \times 6 \mu\text{m}$, apex capitate; clamps not mentioned.

***Gymnopilus chrysopellus* (Berk. & M.A. Curtis) Murrill**

Distribution – Rio Grande do Sul (Singer 1953), Santa Catarina (Karstedt & Stürmer 2008).

Habitat – On dead wood (Hesler 1969).

Note – According Hesler (1969), this species has pileus 25–40 mm, golden yellow, convex then frequently depressed to umbilicate; lamellae adnexed to subdecurrent; veil none; basidiospores $5\text{--}7.5 \times 3.8\text{--}4.7$, ellipsoid; pleurocystidia and caulocystidia absent; cheilocystidia $18\text{--}27 \times 3\text{--}6 \mu\text{m}$, flask-shaped, apex non-capitate; clamp connections present.

***Gymnopilus earlei* Murrill**

Distribution – São Paulo (Pegler 1997), Rio Grande do Sul (Cortez & Coelho 2005), Paraná (De Meijer 2006, 2008 both as '*G. cf. earlei*'), Mato Grosso do Sul (Bononi et al. 2008, as '*G. cf. earlei*', Bononi et al. 2017).

Habitat – Growing in the roots of a fallen angiosperm trunk (e.g. Cortez & Coelho 2005).

Note – According to Hesler (1969), this species is characterized by a large pileus up to 100 mm in diam., convex to plane, pale yellow to pale ferruginous, fibrillose to floccose-squamose; lamellae adnate to subdecurrent; veil arachnoid, yellow, fugacious; basidiospores $6\text{--}8.5 \times 4\text{--}4.5$ (–5) μm , ellipsoid in face-view and inequilateral in profile; pleurocystidia $23\text{--}28 \times 5\text{--}8 \mu\text{m}$, ventricose; cheilocystidia $18\text{--}25 \times 3\text{--}7 \mu\text{m}$, ventricose or conocycloid, apex subcapitate or non-capitate.

***Gymnopilus cf. flavidellus* Murrill**

Distribution – Paraná (De Meijer 2006).

Habitat – On a chestnut stump in woods (Murrill 1917).

Note – According to Murrill (1917), *G. flavidellus* presents pileus 30–50 mm in diam., smooth, melleous to ochraceous; lamellae adnate or sinuate with decurrent tooth; veil arachnoid; basidiospores $8\text{--}9 \times 5\text{--}6 \mu\text{m}$, 'ovoid'; cystidia not mentioned.

***Gymnopilus flavipunctatus* (Speg.) Singer**

Distribution – São Paulo (Pegler 1997), Rio de Janeiro (Albuquerque et al. 2012).

Habitat – Growing on dead wood (Pegler 1997, Albuquerque et al. 2012).

Note – According to Albuquerque et al. (2012), the Brazilian record of this species presents pileus 22 mm in diam., fibrillose; lamellae decurrent; stipe squamulose, exannulate; basidiospores $7.7\text{--}9.5 \times 4.8\text{--}5.3 \mu\text{m}$, ellipsoid; pleurocystidia and cheilocystidia not observed; clamp connections not informed.

***Gymnopilus hispidus* (Masse) Murrill**

Distribution – São Paulo (Bononi et al. 1984).

Habitat – On rotten wood (Hesler 1969).

Note – According to Hesler (1969), this species presents pileus up to 25 mm in diam., umbilicate to infundibuliform, ochraceous fulvous, squamulose, with erect squamules; lamellae subdecurrent; stipe fibrillose, veil or annulus not informed; basidiospores $6-8 \times 4-4.5 \mu\text{m}$, ellipsoid in side view and slightly inequilateral in profile; pleurocystidia and cheilocystidia not seen; clamp connections present.

***Gymnopilus imperialis* (Speg.) Singer**

Distribution – São Paulo (Pegler 1997), Paraná (De Meijer 2006).

Habitat – Growing on frondose trees (Pegler 1997).

Note – According to Hesler (1969), this species is characterized by the pileus up to 100 mm in diam., rufescent saffron to cinnamon saffron, golden ferruginous, golden fulvous, orange fulvous or fulvous, smooth when young then very densely and minutely fibrillose-squamulose with short and appressed fibrils; lamellae adnate or sinuate, with long decurrent tooth; annulus membranous; basidiospores $8-10 \times 7-8.5 \mu\text{m}$, subglobose to broadly ellipsoid; pleurocystidia absent; cheilocystidia $30-40 \times 7-10 \mu\text{m}$, fusoid-ventricose, apex capitate or sub-capitate; clamp connections present.

***Gymnopilus marasmioides* (Berk.) Singer**

Distribution – Amazonas (Berkeley & Cooke 1877, as *Agaricus marasmioides* Berk., Pegler 1988, Singer 1965), São Paulo (Pegler 1997), Paraná (De Meijer 2006).

Habitat – Growing on dead wood (Pegler 1997).

Note – According to Singer (1965), this species presents pileus 5–30 mm in diam., subglabrous and minutely sulcate-striate all over when dry, fulvous, furfuraceous but glabrescent; lamellae adnate, perhaps sometimes emarginated or separate from the stipe; veil absent; basidiospores $6-9 \times 4.8-6.5 \mu\text{m}$ ($7-9 \times 5.5-6 \mu\text{m}$ according to Pegler 1988); pleurocystidia to $33 \mu\text{m}$ long and $7 \mu\text{m}$ wide, clavate and ventricose at upper and lower portion and constricted in the middle; cheilocystidia $21-23 \times 5.5-6 \mu\text{m}$, mostly clavate, constricted below the subcapitate apex; clamp connections present.

***Gymnopilus pampeanus* (Speg.) Singer**

Distribution – São Paulo (Pegler 1997); Rio Grande do Sul (Drechsler-Santos et al. 2007).

Habitat – Growing on *Eucalyptus* trunk (Pegler 1997).

Note – According to Pegler (1983), this species presents pileus 50–120 (–190) mm in diam., zinc orange to lemon chrome, surface minutely appressed fibrillose-squamulose; lamellae adnexed to sinuate adnate; annulus membranous, persistent; basidiospores $6.5-9.5 \times 5-6.5 \mu\text{m}$, subglobose to broadly ovoid; pleurocystidia absent or scattered and similar to cheilocystidia; cheilocystidia $23-32 \times 5-8 \mu\text{m}$, fusoid to subventricose, apex sometimes subcapitate; clamp connections present.

***Gymnopilus panurensis* (Berk.) Pegler**

Distribution – Amazonas (Berkeley 1856, Berkeley & Cooke 1877, as *Agaricus panurensis* Berk., Pegler 1988).

Habitat – On the ground (Pegler 1988).

Note – According to Berkeley (1856) and Pegler (1988), this species has pileus 20–60 mm in diam., with triangular fulvous squamules; lamellae adnate; veil absent; basidiospores $8-10 \times 5.5-7 \mu\text{m}$ (L = $9.5 \mu\text{m}$; W = $6.3 \mu\text{m}$; Qm = 1.52), broadly ovoid; pleurocystidia and cheilocystidia unknown.

***Gymnopilus peliolepis* (Speg.) Singer**

Distribution – São Paulo (Spegazzini 1919, as *Pholiota peliolepis*, Singer & Digilio 1952, Pegler 1997), Rio Grande do Sul (Singer 1953), Paraná (De Meijer 2006).

Habitat – On deciduous tree trunks (Hesler 1969).

Note – According to Singer (1952), Hesler (1969), and Guzmán-Dávalos et al. (2008), this species presents pileus 20–70 mm in diam., red to deep purple squamules on pileus; lamellae sinuate-adnate to adnate-decurrent; veil cortinoid; basidiospores $6.8\text{--}9 \times 4.3\text{--}5.8 \mu\text{m}$ (Singer & Digilio 1952), $6\text{--}8$ (–9) $\times 4\text{--}4.5 \mu\text{m}$ (Hesler 1969), $6\text{--}8 \times 4.4\text{--}5.2 \mu\text{m}$ from the spore print and $6.4\text{--}7.2 \times 4\text{--}4.8 \mu\text{m}$ from the basidiomata (Guzmán-Dávalos et al. 2008), ellipsoid to oblong; pleurocystidia $22\text{--}27 \times 5\text{--}6 \mu\text{m}$, ventricose (Hesler 1969); cheilocystidia $23\text{--}36 \times 6.8\text{--}10.3 \mu\text{m}$ ampullaceous (Singer 1952) or $12\text{--}32 \times 4\text{--}6 \mu\text{m}$, flask-shaped, ventricose to subfusoid, apex non-capitate or sometimes capitate (Hesler 1969); caulocystidia $33\text{--}73 \times 5\text{--}12 \mu\text{m}$, filamentous to subclavate (Hesler 1969); clamp connections present. Guzmán-Dávalos et al. (2008) pointed out that is difficult to have an adequate interpretation of *G. peliolepis* due to differences among several authors as observed above, as well as the presence of two classes of basidiospores, with different ornamentation, in the type specimen.

***Gymnopilus picreus* (Pers.) P. Karst.**

Distribution – Rio Grande do Sul (Rick 1961)

Habitat – On conifer wood and sometimes on hardwood (Hesler 1969).

Note – According to Hesler (1969), this species presents pileus 10–20 (–50) mm in diam., subsquamulose, hygrophanous, rufous to bay brown cinnamon; lamellae adnate to decurrent; stipe exanulate; basidiospores $7\text{--}9$ (–9.5) $\times 4.5\text{--}5.5$ (–6) μm , ellipsoid or subovoid in face view, slightly inequilateral in profile; pleurocystidia $27\text{--}35 \times 6\text{--}8 \mu\text{m}$, ventricose; cheilocystidia $23\text{--}33 \times 4\text{--}7 \mu\text{m}$, ventricose, apex capitate to non-capitate; caulocystidia $30\text{--}62 \times 5\text{--}17 \mu\text{m}$, flask-shaped, apex capitate; clamp connections present.

***Gymnopilus pratensis* Singer**

Distribution – São Paulo (Bononi et al. 1981).

Habitat – Growing on grass Singer & Digilio (1952).

Note – According to Singer & Digilio (1952), this species presents pileus 15 mm in diam., ferruginous ochraceous brown at centre then brown yellow at margin, minutely appressed fibrillose; lamellae adnate; stipe exannulate; basidiospores $6.8\text{--}7.5 \times 5.5 \mu\text{m}$; pleurocystidia absent; cheilocystidia $23\text{--}28 \times 4.7\text{--}7 \mu\text{m}$, cylindrical at base to ventricose and with sharp and subcapitate apex with brownish resinous incrustations; clamp connections present.

***Gymnopilus psamminus* (Berk.) Singer**

Distribution – Amazonas (Berkeley 1856, as *Agaricus psamminus*, Pegler 1988).

Habitat – On the ground (Pegler 1988).

Note – According to Pegler (1988), this species presents pileus 10 mm in diam., smooth, whitish; lamellae “attenuate behind and attached at top of stipe”; stipe exannulate; basidiospores $9.5\text{--}13 \times 5\text{--}7 \mu\text{m}$ (L = 11 μm , W = 6 μm , Qm = 1.80) elongate to subamigdaliform; pleurocystidia and cheilocystidia not mentioned; clamp connections not mentioned.

***Gymnopilus purpureosquamulosus* Høil.**

Distribution – Paraíba (Magnago et al. 2013, as ‘*G. purpureosquamulosus* (Peck) Singer’).

Habitat – On decaying hardwood in mixed riparian forest, on living trunks of *Phoenix canariensis* near the sea, on a log in tropical forest, or on a wooden wall next to a palm (Guzmán-Dávalos et al. 2008).

Note – According to Guzmán-Dávalos et al. (2008), this species presents pileus (10–) 23–95 mm in diam., squamules lilac-pink, red fuchsia, reddish, rusty red, or pale brown when rain-soaked and purple when dry; lamella adnate, uncinately-adnate or shortly decurrent; with fugacious annulus in older stages; basidiospores $(6.4\text{--})7.2\text{--}9.6$ (–10.4) $\times (4\text{--})4.7\text{--}6$ (–6.4) μm [Q = 1.33–1.80 (–1.90)], ellipsoid to oblong then amygdaliform with obtuse to very few truncate apex; subhymenium cellular with some elongated elements; pleurocystidia absent or scarce; cheilocystidia $16\text{--}29$ (–40) $\times 3.2\text{--}8$ (–10) μm , lageniform or cylindrical with capitate to subcapitate apex; caulocystidia $22.4\text{--}73$ (–

88) \times 3.2–17 μm , cylindrical or clavate, few utriform or lageniform, apex obtuse, subcapitate or capitate; clamp connections present.

Gymnopilus purpureogrammicola Silva-Junior & Wartchow

Distribution – Paraíba (Silva-Junior & Wartchow 2015).

Habitat – Growing on grass (Silva-Junior & Wartchow 2015).

Note – According to Silva-Junior & Wartchow (2015), this species presents pileus 10–32 mm in diam., with purple, reddish brown or vinaceous squamules; lamellae short-decurrent; annulus fibrillose; basidiospores (6.1–)6.4–9.7(–10.2) \times (4.1–)4.6–6.7 μm [L = 7.8 μm ; W = 5.3 μm ; Q = (1.21–)1.23–1.74(–1.90), Qm = 1.45], ellipsoid to few widely ellipsoid and elongate; subhymenium cellular; pleurocystidia and cheilocystidia not found; caulocystidia 25–32 \times 5.5–6.5 μm , slender clavate to lageniform; clamp connections present.

Gymnopilus pyrrhus (Berk. & M.A. Curtis) B.J. Rees

Distribution – Paraná (De Meijer 2006).

Habitat – Growing on trunks (Dennis 1970).

Note – According to Dennis [1970, as *Pyroglossum pyrrhus* (Berk. & M.A. Curtis) Singer], the species has pileus to 25 mm in diam., light brown, smooth or tomentose; lamellae subdecurrent; stipe laterally attached, exannulate; basidiospores 5–6 \times 3.5 μm , shape not mentioned; pleurocystidia and cheilocystidia not mentioned.

Gymnopilus russipes Hesler & A.H. Sm.

Distribution – Paraná (De Meijer 2008).

Habitat – On rotten fallen branch (Pegler 1983).

Note – According De Meijer (2008), it is characterized by the pileus 10–45 mm in diam., brown to brownish orange at centre then paler toward margin, smooth, dry, glabrous; lamellae adnexed to narrowly adnate; exannulate; basidiospores 8–9 \times 6.5–7.5 μm ; pleurocystidia absent; cheilocystidia 18–23 \times 4–7 μm , lageniform-subtibiiform to tibiiform, apex slightly capitate.

Gymnopilus spectabilis (Weinm.) A.H. Sm.

Distribution – Rio Grande do Sul (Rick 1961)

Habitat – On conifer and deciduous logs, stumps, living and dead trunks or buried wood (Hesler 1969).

Note – According to Hesler (1969), this species possesses pileus (50–)80–180 mm in diam., buff-yellow or more rarely at first whitish, or “deep chrome”, “xanthine orange”, “antimony yellow”, to “sudan brown” or “raw sienna”, nearly glabrous, sometimes appressed-fibrillose and minutely squamulose at centre; lamellae adnate to decurrent; membranous veil; basidiospores (7–)8–10 \times 4.5–5.5(–6) μm , ellipsoid to ovoid in side-view to slightly inequilateral in profile; pleurocystidia 21–33 \times 6–7 μm , ventricose, scattered; cheilocystidia 24–43 \times 4–8 μm , ventricose, apex capitate or not capitate; caulocystidia (20–)36–65(–107) \times (2.5–)5–10 μm , somewhat similar to cheilocystidia; clamp connections present.

Gymnopilus subtropicus Hesler

Distribution – Paraná (De Meijer 2006), Paraíba (Magnago et al. 2015).

Habitat – On gum log (Hesler 1969).

Note – According to Hesler (1969) this species has pileus 10–45 mm in diam., yellowish, fibrillose; lamellae adnate-decurrent; stipe with arachnoid fugacious annulus; basidiospores (5–)5.5–7 \times 4–4.5 μm , ellipsoid in side-view and slightly inequilateral in profile; pleurocystidia 23–30 \times 5–8 μm , ventricose; cheilocystidia 12–30 \times 3–6 μm , flask-shape to ventricose, apex non-capitate, more rarely capitate; caulocystidia 22–26 \times 4–9 μm , ventricose, cylindrical or clavate at times capitate.

Gymnopilus trailii (Berk. & Cooke) Singer

Distribution – Amazonas (Berkeley & Cooke 1877, as *Agaricus trailii* Berk. & Cooke, Pegler 1988).

Habitat – On decayed wood (Pegler 1988).

Note – According to Berkeley & Cooke (1877) and Pegler (1988), this species has pileus ‘½ inch’ (about 12 mm) in diam., fulvous with erect squamules at surface; lamellae attachment not mentioned; membranous annulus; basidiospores $5.5\text{--}6 \times 3.7\text{--}4.5 \mu\text{m}$ ($L = 5.6 \mu\text{m}$, $W = 4.2 \mu\text{m}$, $Q_m = 1.30$), ovoid to short amygdaliform; pleurocystidia $18\text{--}25 \times 5\text{--}7 \mu\text{m}$, utriform, apex often subcapitate, numerous; cheilocystidia $24\text{--}30 \times 5\text{--}7 \mu\text{m}$, sinuous-lageniform.

Species with doubtful record

Gymnopilus aureobrunneus (Berk. & M.A. Curtis) Murrill

Distribution – Unknown place (Montagne 1856, as *Cortinarius weddellianus* Mont., Pegler 1990)

Habitat – On logs and stumps (Hesler 1969).

Note – According to Hesler (1969) this species has pileus 20–50 mm in diam., golden yellow, appressed-fibrillose, dry; lamellae adnate or adnexed; veil not reported; basidiospores $5.5\text{--}7.5 \times 4\text{--}4.5 \mu\text{m}$, ellipsoid in side-view and slightly inequilateral in profile; pleurocystidia absent; cheilocystidia $20\text{--}24 \times 3\text{--}4 \mu\text{m}$, flask-shape, apex non-capitate. On the other hand, Pegler (1990) mentioned *Cortinarius weddellianus* with pileus 130–150 mm in diam., reddish yellow, slightly squamulose, and growing on soil. He suspected that this species could correspond to *G. aureobrunneus*.

Final remarks

From Brazil, 22 species of *Gymnopilus* are reported, occurring in the states of Amazonas, Mato Grosso do Sul, Paraíba, Paraná, Rio Grande do Sul, Santa Catarina, and São Paulo. However, some names cited here need to be reviewed to confirm their identity.

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