

**GYMNOPUS BELTRANIAE, A NEW SPECIES OF  
SECTION VESTIPEDES (AGARICALES) FROM THE  
CANARY ISLANDS (SPAIN)**

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*Gymnopus beltraniae*, collected on the Canary Islands in 'monteverde' forest as well as mixed monteverde/Canary pine forest, is proposed as a new species belonging to sect. *Vestipedes* subsect. *Vestipedes*. It is compared with species from North and South America considered to represent the closest taxa in its section.

Collecting fungi for an exhibition at the 5th and 16th 'Jornadas Micológicas' of Gran Canaria and Tenerife, respectively, we discovered an interesting *Gymnopus* species in mixed monteverde/Canary pine forest as well as in plantations of *Pinus radiata* D. Don. Further rich collections were subsequently found in genuine monteverde forest during collecting trips to Garajonay National Park on the island of La Gomera. 'Monteverde forest' is a form of Mediterranean hard-leaved forest that survives as a relict on the Canary Islands, following its disappearance from Mediterranean riversides in the course of glaciations at the end of the Tertiary period.

Based on its morphological features, the new *Gymnopus* species belongs to sect. *Vestipedes* (Fr.) Antonín, Halling & Noordel., close to the *G. subnudus/biformis/subfumosa* group from North and South America. Following comparison of the Canary material with types and other collections of American and other species in its section, we decided to describe *Gymnopus beltraniae* as a new species.

Microscopic features are described from material mounted in Melzer's reagent and in Cotton blue. For the basidiospores the following factors are used: E (quotient of length and width in any one spore) and Q (mean of E-values). Colour abbreviations follow Kornerup & Wanscher (1983), and herbarium abbreviations follow Holmgren (2003).

***Gymnopus beltraniae* Bañares, Antonín & G. Moreno, spec. nov. — Figs. 1, 2**

Pileo 10–25 mm lato, convexo vel plano-convexo, rubro-brunneo, centro obscuriore. Lamellis medio confertis. Stipite 50–80 × 3–5 mm, cylindraco, dense tomentosio, rubro-brunneo, ad basim obscuriore. Basidiosporis (7.0–)8.0–9.5 × 3.5–4.5(–5.0) μm, (late) ellipsoideis, elipsoid-fusiformibus, hyalinis, inamyloideis. Cheilocystidiis 28–45 × 7.0–11 μm, clavatis, cylindracois, sublageniformibus, subutiformibus, irregularibus. Pileipellis ex hyphis cylindracois, usque 12 μm latis, projectionibus irregularibus, tenuiparietalis. Caulocystidiis 18–35 × 4.5–8.0 μm, cylindracois vel clavatis, nunquam irregularibus, tenuiparietalis vel leviter crassiparietalis. Hyphis fibulatis, in stipite et medulla indextrinoideis.

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Holotypus (hic designatus): Hispania, Insula Canaria, Tenerife (Aguamansa), 25.XI.1997, leg. E. Beltrán, in herbario TFC Mic. 8277 asservatur (isotypus in herbario BRNM 691175 asservatur).  
Etymology: beltraniae, Dra. Esperanza Beltrán-Tejera dedicatum est.

Carpophores caespitose. Pileus 10–25 mm broad, convex when young, then expanding to plano-convex, sometimes umbilicate, with involute and striate margin, not or slightly hygrophanous, reddish brown to flesh coloured, usually with darker centre. Lamellae rather distant,  $L = 24\text{--}30$ ,  $l = 11\text{--}23$ , free, furcate, white to cream, with concolorous, flocculose edge. Stipe 50–80 × 3–5 mm, cylindrical, sometimes longitudinally compressed and grooved, densely hairy or velvety, same colour as pileus but with darker base. Smell fruity.

Basidiospores (3 collections)  $(7.0\text{--})8.0\text{--}9.5 \times 3.5\text{--}4.5\text{--}5.0 \mu\text{m}$ ,  $av = 8.4 \times 4.1 \mu\text{m}$ ,  $E = 1.8\text{--}2.4$ ,  $Q = 2.0\text{--}2.1$  (in one carpophore of coll. 8277:  $8.0\text{--}10\text{--}11 \times 4.0\text{--}5.5\text{--}6.0 \mu\text{m}$ ,  $av = 9.2 \times 5.1 \mu\text{m}$ ,  $E = 1.5\text{--}2.0$ ,  $Q = 1.8$ ), (broadly) ellipsoid, fusoid-ellipsoid, thin-walled, smooth, non-dextrinoid. Basidia  $25\text{--}27 \times 8.0 \mu\text{m}$ , 4-spored, clavate. Basidioles  $15\text{--}30\text{--}35 \times 3.0\text{--}8.0 \mu\text{m}$ , cylindrical, clavate or subfusoid. Cheilocystidia  $28\text{--}45 \times 7.0\text{--}11 \mu\text{m}$ , clavate, cylindrical, sublageniform or subutriform, often irregular or subcoralloid, sometimes branched, thin- to slightly thick-walled. Pleurocystidia absent. Trama hyphae cylindrical, thin-walled, subhyaline, non-dextrinoid, up to  $10.0 \mu\text{m}$  wide. Pileipellis a cutis composed of radially arranged, cylindrical to subinflated, mostly distinctly incrustated, thin- to slightly thick-walled hyphae up to  $12 \mu\text{m}$  wide, with branched, narrow (up to  $5.0 \mu\text{m}$ ), thin-walled projections; incrustation dark brown

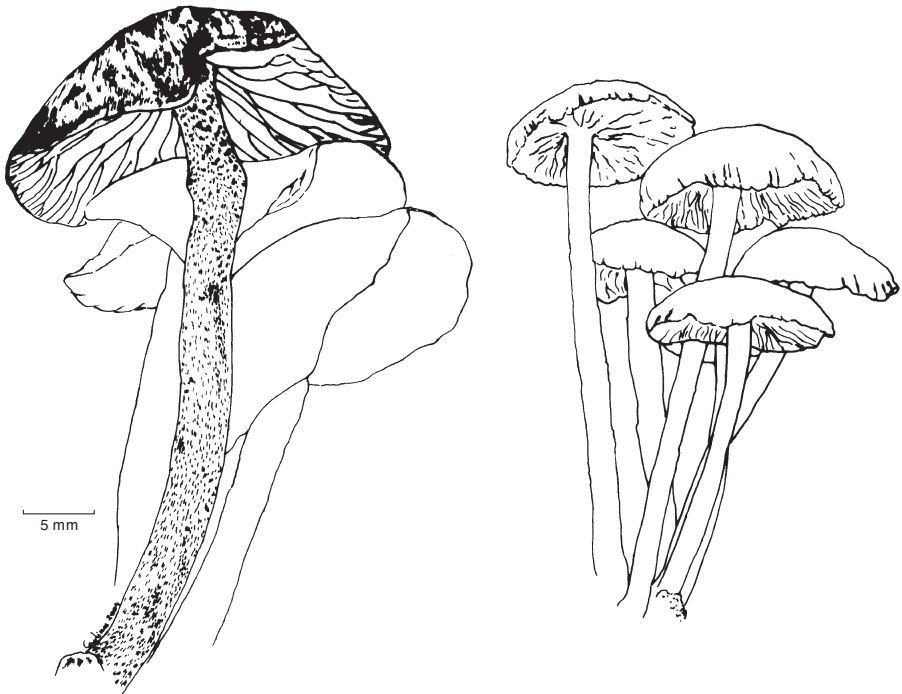


Fig. 1. *Gymnopus beltraniae*. Habit sketch. Del. Carlos Rodríguez.

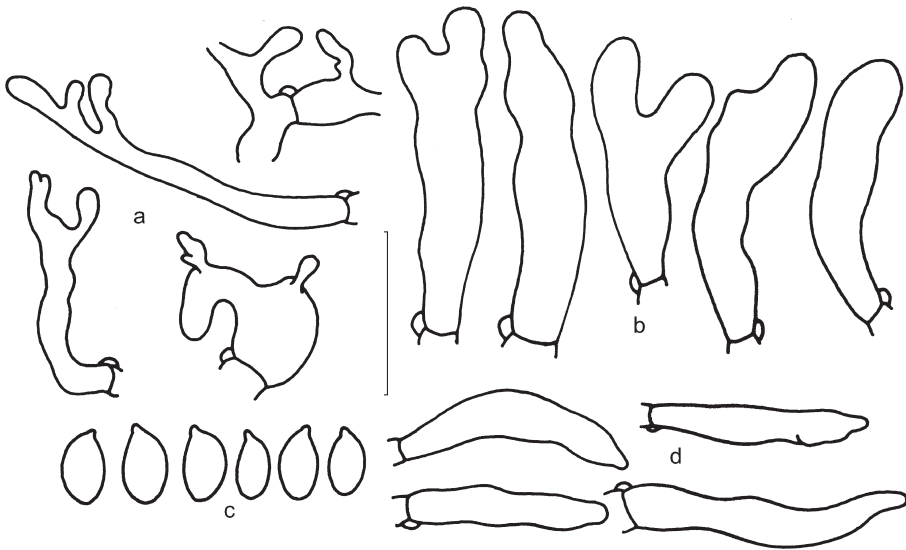


Fig. 2. *Gymnopus beltraniae* (holotype). a. Pileipellis hyphae; b. cheilocystidia; c. basidiospores; d. caulocystidia. Scale bar = 20  $\mu\text{m}$ . Del. Vladimír Antonín.

in KOH. Stipitipellis a cutis consisting of cylindrical, parallel, slightly thick-walled, non-dextrinoid hyphae up to 5.0  $\mu\text{m}$  wide, with pale yellowish greyish walls in KOH. Caulocystidia numerous, 18–35  $\times$  4.5–8.0  $\mu\text{m}$ , cylindrical to clavate, sometimes irregular, sometimes with a small rostrum, thin- to thick-walled, non-dextrinoid. Clamp-connections present.

Ecology — Saprotrophic, common in a mixed monteverde/Canary pine forest, among needles of *Pinus canariensis* and in a stand with introduced *Pinus radiata*. Also in a genuine monteverde forest, among leaves of *Laurus azorica* (Seub.) Franco and *Myrica faya* Aiton, on wood of dead trees and rhizomes of *Davallia canariensis* (L.) Sm.

*Revised specimens*: SPAIN: Canary Islands, Gran Canaria, Fontanales, pinar de Galeote, 18.XII.1992, leg. Á. Bañares & G. Moreno (TFC Mic. 8294). – Tenerife, pinar cerca de Aguamansa, 25.XI.1997, leg. E. Beltrán (holotype TFC 8277; isotype BRNM 691175). – La Gomera, Garajonay National Park (Meriga), 11.XI.2000, leg. Á. Bañares (TFC Mic. 9773, BRNM 691177); Garajonay National Park (Chorros de Epina), 11.XI.2000, leg. E. Beltrán (TFC Mic. 9768); Garajonay National Park (near Agando), 12.XI.2000, leg. E. Beltrán (TFC Mic. 9703, BRNM 691176); Garajonay National Park (Llanos de Crispín), 29.XI.2000, leg. Á. Bañares (TFC Mic. 10842); Garajonay National Park (near El Quemado), 20.I.2001, leg. E. Beltrán (TFC Mic. 10844); Garajonay National Park (Jardín de las Creces), 21.I.2001, leg. E. Beltrán (TFC Mic. 10843).

*Gymnopus beltraniae* is characterised macroscopically by its caespitose carpophores, a convex then plano-convex pileus which is reddish brown to flesh coloured, darker at the centre, and not or only slightly hygrophanous, rather distant lamellae, and densely hairy or velvety stipe which is sometimes longitudinally compressed and grooved and which is concolorous with the pileus but with a darker base. Microscopically *G. beltraniae* is characterised by its moderately large basidiospores, clavate, cylindrical,

sublageniform or subutriform cheilocystidia which are often irregular and branched, a pileipellis composed of radially arranged, cylindrical to subinflated, mostly incrustated hyphae with branches and projections, and numerous, cylindrical to clavate, sometimes irregular caulocystidia. Based on these characters, it belongs to sect. *Vestipedes* subsect. *Vestipedes* (Antonín & Noordeloos, 1997). A photograph has been published by Dähncke (1998) as *Collybia tergina* (Fr.) Lundell.

The closest species are those of the *G. subnudus/biformis/subfumosus* group from North and South America.

*Gymnopus biformis* (Peck) Halling (holotype NYS 0354) has less distant lamellae, a stipe white above and tawny to vinaceous brown toward the base (Halling, 1983, 1997), smaller basidiospores ( $7.0\text{--}8.5 \times 3.0\text{--}3.5\text{--}(4.0) \mu\text{m}$ ), and distinctly coralloid cheilocystidia. This species has recently also been found in Japan (Miyamoto et al., 1998).

*Gymnopus subpruinus* (Murrill) Desjardin, Halling & Hemmes (holotype NY) differs in its non-caespitose carpophores, a broader, striate-rugulose, innately fibrillose pileus (15–40 mm broad, 20–60 mm according to Dennis, 1951), a pileus colour which is chestnut-brown to reddish brown at centre, elsewhere medium brown and occasionally tinged purplish brownish, and a smaller stipe measuring 20–50  $\times$  1.0–3.0 mm (Halling, 1983, 1997). Cheilocystidia are partly similar to *G. beltraniae*, partly with distinctly coralloid-diverticulate apex.

*Gymnopus subnudus* (Ellis ex Peck) Halling (holotype NY) has a rapidly rugulose-sulcate pileus, which may be rugulose-undulate at margin, and is cinnamon brown when fresh, usually fading to cinnamon with age or when dried; it also has a stipe which is subglabrous above, whitish to greyish pubescent below, appearing glabrous when wet or water soaked (Halling, 1983, 1997). Microscopically, *G. subnudus* has larger basidiospores ( $9.5\text{--}12 \times 4.0\text{--}5.0 \mu\text{m}$ ) and cheilocystidia which are larger ( $28\text{--}63 \times 5.0\text{--}8.5 \mu\text{m}$ ) and differently shaped (subulate, cylindrical or fusoid, sometimes apically coralloid). Not having the type specimen available, we studied three recent collections from the USA preserved in the NYS herbarium (see list below).

*Collybia subfumosa* Speg. (holotype LPS 16121) has a 10–60 mm broad, light brown to brown then brownish orange pileus, crowded lamellae, and a slightly larger (25–90  $\times$  2–7 mm), white then light brown stipe which is apically  $\pm$  glabrous and subpubescent towards the base (Halling, in litt.; Spegazzini, 1887). Basidiospores are larger ( $8.5\text{--}11 \times 5.3\text{--}6.0 \mu\text{m}$ ) and cheilocystidia smaller ( $18\text{--}31 \times 7.0\text{--}12 \mu\text{m}$ ), (broadly) clavate, sometimes irregular (the type specimens are covered by mould). Dennis (1951), however, mentioned an orange-cinnamon streaked pileus with brown fibrils, a finely velvety stipe, basidiospores measuring  $7\text{--}9 \times 4\text{--}5 \mu\text{m}$ , and no cheilocystidia. This probably represents a different species. An interpretation of the species by Pegler (1983) differs in having a white pruinose stipe (with hairs), basidiospores measuring  $7.5\text{--}10 \times 4\text{--}5.2 \mu\text{m}$ , and short ( $20\text{--}32 \times 6\text{--}8 \mu\text{m}$ ) cheilocystidia.

*Gymnopus contrarius* (Peck) Halling (= *Collybia pinastris* (Kauffman) Mitchel & A.H. Sm.) has a snuff to buffy brown pileus when fresh, fading with age to clay or ochraceous buff on the disc and yellowish buff towards the margin. It also has a smaller stipe (20–40  $\times$  (0.5–)1–1.5(–2.5) mm), a slightly alliaceous, garlic or rotten cabbage odour, a taste of garlic, subastringent or not, slightly narrower basidiospores (( $7.4\text{--}$ ) $8.6\text{--}9.8\text{--}(10.8) \times 3.2\text{--}4.4 \mu\text{m}$ ), and lacks cheilo- and pleurocystidia (Halling,

1983, 1997). According to Miyamoto et al. (1998), its pileus is even smaller (4–16 mm broad), brown to reddish brown at centre and paler to pinkish white towards margin or entirely pale brown and fading to very pale brown when old, and more distant lamellae ( $L = 13-23$ ).

*Gymnopus subcyathiformis* (Murrill) Desjardin, Halling & Hemmes has a smaller pileus, 10–15(–30) mm across, which finally becomes centrally depressed, a longer (20–125 × 1–5 mm), pruinose stipe, smaller basidiospores (4.5–7.8 × 2.3–3 μm), and smaller (7–30 × 1.5–3 μm), filiform cheilocystidia (Pegler, 1977).

*Gymnopus allegetii* (De Seynes) A.W. Wilson, Desjardin & E. Horak has a larger (20–50 mm across), yellowish grey, then light pinkish cinnamon or cartridge buff pileus, a larger stipe (30–100 × 3–8 mm), smaller basidiospores (5.5–8 × 3–3.7 μm), and smaller (14–35 × 2–6 μm) nodulose cheilocystidia (Pegler, 1977).

*Revised specimens of other species: Collybia subfumosa*: Brazil, Apiahy, Serra Paranapiacaba, V.1888, leg. J. Puiggari 2914 (holotype LPS 16121). *Gymnopus bififormis*: USA: New York, Sand Lake, VIII.1902, leg. C.H. Peck (holotype of *Marasmius bififormis* NYS 0354). *Gymnopus subnudus*: USA: Massachusetts, Sunderland, Mt Toby, 10.VIII.1953, leg. H.E. & M.E. Bigelow 8376, det. M. Gilliam (NYS). – Massachusetts, Franklin Co., route 202 north of New Salem, 14.VII.1977, leg. et det. R.E. Halling 2094 (NYS). – Maine, Penobscot Co., Old Town Orono, College Ave., 5.VIII.1979, leg. et det. R.E. Halling 2948 (NYS). *Gymnopus subpruinus*: Jamaica, Cockpit Co., Troy and Tyre, 12–14.I.1909, leg. W.A. Murrill & W. Harris 947 (holotype of *Marasmius subpruinus* NY).

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#### REFERENCES

- Antonín, V. & M.E. Noordeloos. 1997. A monograph of *Marasmius*, *Collybia* and related genera in Europe. Part 2: *Collybia*, *Gymnopus*, *Rhodocollybia*, *Crinipellis*, *Chaetocalathus*, and additions to *Marasmiellus*. *Libri Botanici* 17: 1–256.
- Dähncke, R.M. 1998. *Las setas/Die Pilze in La Palma*. La Palma.
- Dennis, R.W.G. 1951. Some agaricaceae of Trinidad and Venezuela. *Leucosporae*. Part 1. *Trans. Brit. Mycol. Soc.* 34: 411–482.
- Halling, R.E. 1983. The genus *Collybia* (Agaricales) in the north-eastern United States and adjacent Canada. *Mycol. Memoir* 8: 1–148.
- Halling, R.E. 1997. A revision of *Collybia* s.l. in the north-eastern United States and adjacent Canada. Internet page <http://www.nybg.org/bsci/res/col>.
- Holmgren, P.K. 2003. Index herbariorum. Internet page <http://sciweb.nybg.org/science2/IndexHerbariorum.asp>.
- Kornerup, A. & J.H. Wanscher. 1983. *Methuen handbook of colour*. Ed. 3. London.
- Miyamoto, T., T. Igarashi & K. Takahashi. 1998. *Collybia bififormis* and *C. pinastri* new to Japan. *Mycoscience* 39: 205–209.
- Pegler, D.N. 1977. A preliminary agaric flora of East Africa. *Kew Bull., Addit. Ser.* 6: 1–615.
- Pegler, D.N. 1983. Agaric flora of the Lesser Antilles. *Kew Bull., Addit. Ser.* 9: 1–668.
- Spazzolini, C.L. 1887. *Fungi Puiggariani*. *Bol. Acad. Nac. Ci.* 11: 381–622.