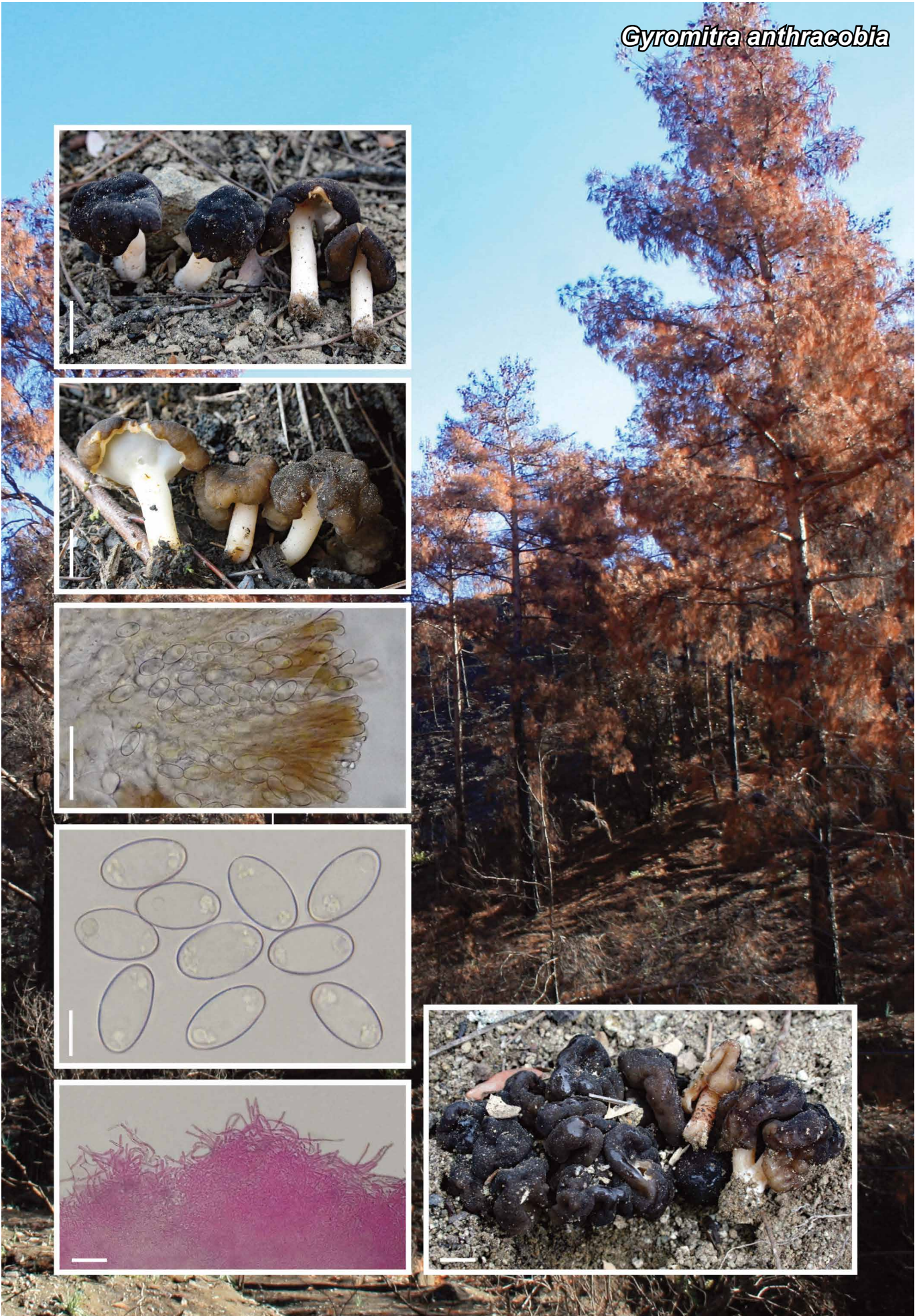
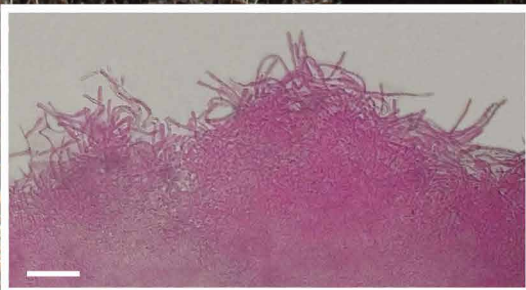


Gyromitra anthracobia



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Gyromitra* subg. *Pseudoverpa* P.-A. Moreau, Bellanger & Loizides, subg. nov.Etymology.* Due to the resemblance of species in the genus *Verpa*.Classification — *Discinaceae*, *Pezizales*, *Pezizomycetes*.

Ascomata carbonicolous, gyromitroid or verpoid in aspect, stipitate, occasionally rufescent, comprised of a grey-brown, purple-

brown or black cerebriform pileus and a smooth, white hollow stipe attached to the pileus only at the apex; spores smooth, cyanophilic, mostly biguttulate; paraphyses brown-pigmented.

Type species. *Gyromitra anthracobia* Loizides, P.-A. Moreau & Bellanger. MycoBank MB824545.***Gyromitra anthracobia* Loizides, P.-A. Moreau & Bellanger, sp. nov.***Etymology.* *Anthracobia* = ανθρακόβια (carbon-dwelling); from the Greek ανθραξ = carbon, and βίος = life.

Pileus cerebriform, moderately to strongly lobate, 1–4(–6) cm diam, 1–2.5(–3) cm in height, finely tomentose and irregularly variegated, ranging from pale red-brown, olive-brown, purple-brown, purple-grey, or charcoal-grey, becoming black when fully mature or dry; margin deeply involuted but completely detached from the stipe, thick, white, gradually expanding outwards at maturity. *Excipulum* decurrently attached to the stipe, blue-grey under pileus, chalk-white elsewhere, smooth to subtomentose, sometimes with a faintly ochraceous tomentum towards the margin. *Stipe* 1.5–4(–5) cm long by 0.5–1 cm across, cylindrical, attached to the pileus only at the apex, stuffed with a cottony substance when young but soon hollow, pure white and finely tomentose, tomentum sometimes becoming ochraceous-pink to ochraceous-orange. *Context* white, unchanging when bruised, but ascomata occasionally developing prominent red or orange stains. *Odour* somewhat herbaceous. *Ascospores* (16–)18–21(–22.5) × (9–)10–11.5(–12) μm (Me = 19.7 × 11; Q = 1.5–2.2; Qm = 1.79), cyanophilic, ellipsoid, mostly biguttulate in water, sometimes also microguttulate at the poles, thick-walled, hyaline and smooth. *Asci* 150–270 × 13–16 μm, inamyloid, monoseriate, aporhynchus, often flexuous. *Paraphyses* 45–125 μm long, fasciculate, mostly bifurcate and 2–3-septate, with a slightly thickened wall and brown intraparietal pigment all along, often minutely incrustated at the lower part; apices slightly enlarged, cylindrical to clavate, 5–9.5 μm wide. *Subhymenium* 250–300 μm thick, a *textura epidermoidea* composed of small, intricate, jigsaw-like elements with yellowish thickened wall (< 1 μm). *Context* 400–700 μm thick, a mixture of subglobose, ellipsoid, polygonal or filamentous elements, all pale and slightly thick-walled. *Excipulum* 2-layered: inner layer slightly gelatinised, 40–50 μm thick, composed of thick-walled (< 1 μm), pale yellow hyphae, partly slender, 4–5 μm thick, partly globose or ellipsoidal 16–25 μm wide; outer layer hymenidermoid, made of clusters of erect or adpressed, 1(–2)-septate clavate hyphae 35–60 × 8–15 μm, with weakly thickened but bright yellow wall, embedded in pale yellow resinaceous matrix. *Stipitipellis* a cutis of slender, smooth, or rarely incrustated hyphae, 3–6 μm wide, with locally protruding, fasciculate cylindrical terminal elements. *Medulla* predominantly of broad, hyaline ellipsoid elements 12–30 μm wide.

Colour illustrations. Holotype collection area at Kourдали, Cyprus; ascomata *in situ*, holotype coll. LIP 0001407 (scale bar = 10 mm); coll. ML71382VE *in situ* (scale bar = 10 mm); paraphyses and asci in water (scale bar = 50 μm); naturally discharged spores in water (scale bar = 10 μm); stipitipellis hyphae in *Floxina aquosa* + KOH (scale bar = 100 μm); coll. ML71322V5 *in situ* (scale bar = 10 mm).

Habit, Habitat & Distribution — Carbonicolous, fruiting in small or large groups between mid-March and mid-April, typically the first and second springs following a forest fire.

Typus. CYPRUS, Kourдали, in 6-mo-old burned forest, 18 Mar. 2017, *M. Loizides* (holotype in Herbarium of the Faculty of Pharmacy of Lille: LIP 0001407, ITS and LSU sequences GenBank MH014751 and MH014750, MycoBank MB824544).

Additional material examined. CYPRUS, Platania, on burned patch, 18 Apr. 2012, *M. Loizides*, ML21481VE, LSU and ITS sequences GenBank H014748 and MH014755; Kourдали, in 6-mo-old burned forest, 22 Mar. 2017, *M. Loizides* & P.-A. Moreau, ML71322V5, LSU and ITS sequences GenBank MH014746 and MH014753; Argaka, in 7-mo-old burned forest, 28 Mar. 2017, *M. Loizides*, ML71382VE, LSU and ITS sequences GenBank MH014747 and MH014754; Kourдали, in 7-mo-old burned forest, 22 Apr. 2017, *M. Loizides*, ML71422V2, LSU and ITS sequences GenBank MH014749 and MH014752.

Notes — Based on current phylogenetic inferences, the ITS locus is very divergent within *Gyromitra*, making analyses strongly biased towards the evolution of the 5.8S rDNA. Contrastingly, the LSU locus allows for the recognition of a monophyletic genus, conveniently divided into five subgenera: *Gyromitra*, *Discina*, *Pseudorhizina*, *Melaleucoides* and *Caroliniana* (Methven et al. 2013). Our rDNA (ITS and LSU) phylogenetic analyses place collections from Cyprus in a well-supported clade within *Gyromitra*, distant from its closest neighbour (*G. esculenta*) by 26 positions (3 % of sequence length) at the LSU locus. Considering the phylogenetic distances between presently accepted subgenera and unique morphoecological profile of the Cypriot collections, a new species and subgenus are here proposed.

Because of the cylindrical, elongated hollow stipe attached to the pileus only at the apex, *G. anthracobia* can strongly resemble a *Verpa* species in the field. However, the cerebriform pileus, brown-pigmented paraphyses and biguttulate cyanophilic spores, are all typical gyromitroid features. Although *G. esculenta* has similarly shaped and sized spores, it can be readily distinguished by its glabrous, chestnut-red pileus, its stout, lacunose stipe, attached to the pileus at several points forming chambers, and larger asci reaching 330–350 μm (Boudier 1909, Harmaja 1979, Breitenbach & Kränzlin 1984). *Gyromitra infula* has occasionally been reported from post-fire environments (Egger & Paden 1986), but has a saddle- or mitre-shaped pileus and narrowly ellipsoidal spores (measuring 19–23 × 7–8 μm acc to Dennis 1978, 19–26 × 7–10 μm acc to Van Vooren & Moreau 2009, or 20–30 × 7–9 μm acc to Medardi 2006). The rare *G. fastigiata* is typically associated with deciduous trees and has an intricately corrugated saddle-shaped pileus and ornamented triguttulate spores with polar appendages, measuring 24–32 × 11–15 μm (Svrček & Moravec 1972, Kotlaba & Pouzar 1974).

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