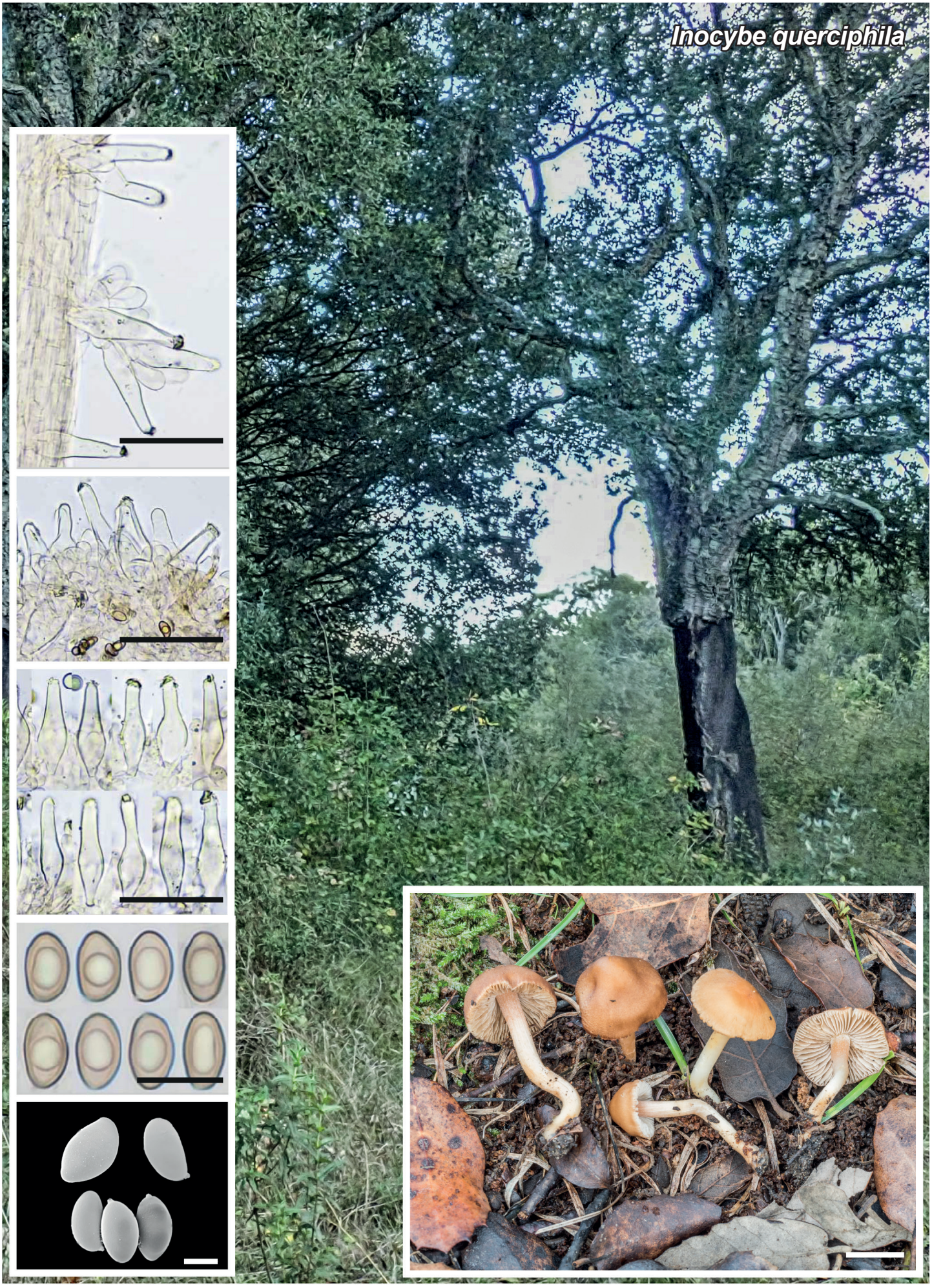


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Fungal Planet 1640 MycoBank MB 851886

Inocybe querciphila Esteve-Rav., Pancorbo & E. Larss., *sp. nov.*

Etymology: The name is derived from the Latin plant name "*Quercus*" and "*-philus*", referring to its ectomycorrhizal relationship with this plant.

Classification: *Inocybaceae*, *Agaricales*, *Agaricomycetes.*

Basidiomata agaricoid and stipitate. *Pileus* 10–20(–25) mm, at first campanulate to hemispherical, later campanulate-convex, to broadly convex, distinctly umbonate, umbo prominent, broad and obtuse with age; margin straight to deflexed, sometimes wavy, entire to crenulate; colour variable depending on hydration, from orange-ochraceous to fulvous orange, cinnamon, sienna to fulvous brown, sometimes chocolate brown (Mu 7.5YR 6/6-8, 5/3-8, 4/4-6); surface dry, often slightly glossy, smooth and radially fibrillose in young stages, often very finely squamulose towards the centre with age, sometimes broken in a delicate tessellate appearance, in old specimens radially fibrose only at margin, hygrophanous to subhygrophanous depending on soil moisture and ambient humidity, not striate. Velipellis not visible at any stage of development. *Lamellae* moderately crowded (L = 42–48); l = 1(–2), 2–4 mm wide, adnexed to narrowly adnate, ventricose, initially whitish, becoming cream to pale ochraceous, ochraceous brown to light tobacco-brown when mature, edge whitish to paler than the sides, finely crenulate. *Stipe* 25–40(–45) × (2.5–)3–4 mm, slender, straight or often curved to sinuate towards the base, cylindrical to hardly enlarged at the base; colour initially dirty white to light ochraceous or buff with slight pink reflection, clearly pinkish to pink reddish at the apex; surface smooth to finely fibrillose at the lower part, sometimes longitudinally striated, clearly floccose towards the apex (upper third), sparsely to indistinctly floccose at the middle. *Cortina* not seen, even in young specimens. *Context* fibrous, concolourous with the surface, slightly pinkish at the stipe apex. *Smell* subspermatic to lightly herbaceous. *Spores* (6.6–)7.2–*7.9*–8.6(–9.3) × (4.1–)4.4–*4.8*–5.2(–5.7) µm, Q: (1.38–)1.47–*1.60*–1.80(–1.95) (n = 249 / N = 2), ellipsoid to ovoid, smooth; with rounded apex. *Basidia* (21.9–)23.7–*26.9*–30.3(–31.3) × (6.4–)6.9–*8.1*–9.2(–9.7) µm; Q: (2.29–)2.75–*3.30*–3.78(–3.95) (n = 63 / N = 2), 4-spored, rarely 2-spored, cylindrical to clavate, sterigmata 3–4 µm long. *Lamellar edge* sterile, composed of numerous protruding cheilocystidia surrounded at the base by ellipsoid to isodiametric subhymenial cells, mixed with hyaline, claviform paracystidia. *Pleurocystidia* (31.5–)35.3–*45.3*–55.1(–58.5) × (10.2–)10.5–*13.7*–17.1(–23.5) µm, Q: (1.75–)2.25–*3.30*–4.62(–4.97), (n = 135 / N = 2), fusiform to sublageniform, most frequently provided with a short pedicel, bearing crystals at apex, sometimes also microcrystals; walls (0.95–)1.09–*1.30*–1.51(–1.57) µm thick, reaching up to 2 µm at the apex, pale yellowish in aqueous ammonia solutions. *Cheilocystidia* (36.6–)39.2–*45.1*–53.7(–59.5) × (10.8–)11.1–*14.6*–18.8(–19.9) µm, Q: (1.94–)2.28–*3.10*–4.05(–4.77) (n = 64 / N = 2), variable in shape, mostly (sub)lageniform to subfusiform. *Stipitipellis* a cutis of parallel hyphae 3.4–6.8 µm wide, with parietal to encrusting yellowish pigment. *Caulocystidia* present in the upper part of the stipe, (36.5–)40.4–*55.1*–68(–73.9) × (10.1–)10.8–*13.6*–17.5(–18.1) µm, Q: (2.56–)3.08–*4.10*–5.52(–6.43) (n = 42 / N = 2), reaching up to the middle of the stipe, although scattered, similar to hymenial cystidia but more slender, often in clusters with cauloparacystidia. *Clamp connections* abundant.

Habitat & distribution: The holotype and one paratype come from the same locality in Corsica, near Corte, in the mesomediterranean bioclimatic floor with a subhumid to humid ombroclimate (Delbosc *et al.* 2021), in a mixed *Quercus* forest (*Q. suber*, *Q. ilex*, *Q. pubescens*) with macchia scrub. The Swedish collection belongs to the Fennoscandian nemoral zone (Moen 1999) and was collected in a moist temperate deciduous forest under *Quercus* and *Fagus*. Judging by the geographical distance at which the collections were found, we assume that it is probably widespread in both continental and Atlantic nemoral areas of Europe but has probably been overlooked because of its banal appearance. BLAST search of NCBI's GenBank nucleotide database and the UNITE database gave no additional data and information.

Typus: **France**, Corsica, Corte, Saint-Jean, Maison San Giovanni, 42°17'38.22"N, 9°10'11.38"E, 419 m a.s.l., in humus of mixed forest of *Quercus suber, Q. ilex* and *Q. pubescens,* with *Arbutus unedo* and some sparse *Pinus pinaster*, with undergrowth of *Cistus monspeliensis,* in acidic soil, 8 Nov. 2019, *A. Altés, F. Pancorbo, F. Esteve-Raventós & G. Moreno* (**holotype** AH 51897; ITS and LSU sequences GenBank PP262644 and PP262643).

Additional materials examined. **France**, Corsica, Corte, Saint-Jean, Maison San Giovanni, 42°17'39.54"N, 9°10'10.40"E, 419 m a.s.l., in humus of mixed forest of *Quercus suber, Q. ilex* and *Q. pubescens, with Arbutus unedo* and some sparse *Pinus pinaster*, with undergrowth of *Cistus monspeliensis,* in acidic soil, 8 Nov. 2019, *A. Altés, F. Pancorbo, F. Esteve-Raventós & G. Moreno* (AH 51894; ITS-LSU sequence GenBank PP262645). **Sweden**, Skåne, Dalby, Dalby Norreskog Nature Reserve, 55°40'45.08"N, 13°20'38.76"E, 85 m a.s.l., in deciduous graced forest and meadows with *Quercus robur*, *Fagus sylvatica* and *Corylus avellana*, on acidic soil, 15 Sep. 1988, *S. Jacobsson*, SJ88053 (GB-0125491; ITS-LSU sequence GenBank AM882899, as *Inocybe cf. tenebrosa*).

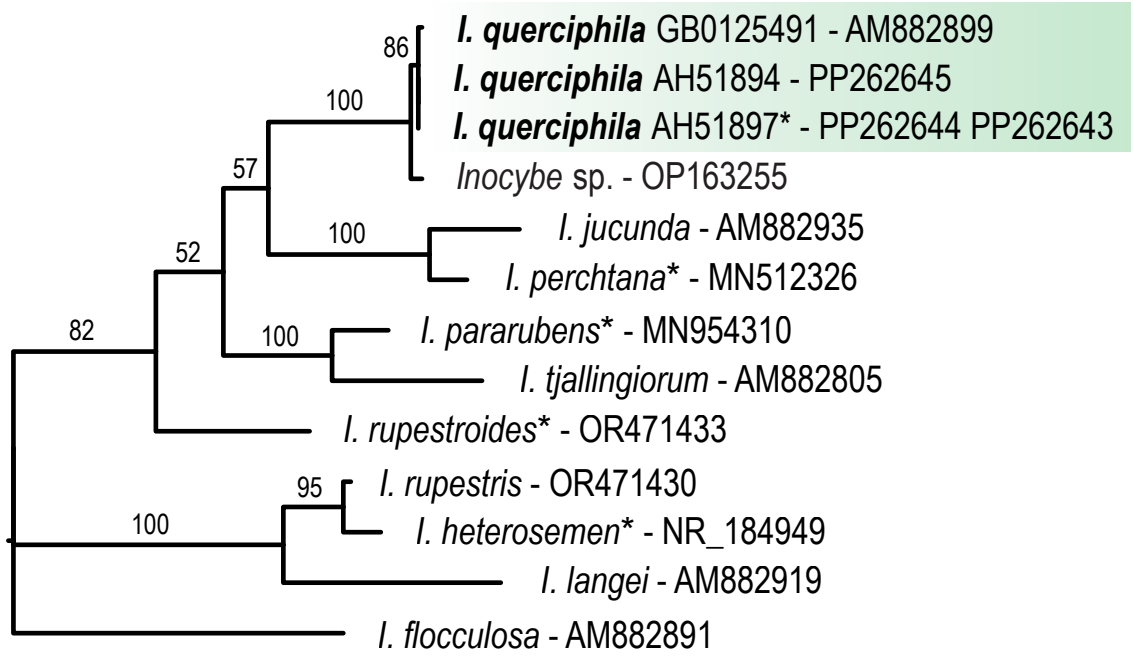
Notes: Colour codes are taken from Munsell (1994), the terminology follows Vellinga (1988) and Kuyper (1986). In phylogenetic and morphological characters *I. querciphila* is a very distinctive species because of the distribution of its caulocystidia, the pinkish tones of the stipe and the small ovoid-ellipsoid spores. According to the practical taxonomic treatment of Bon (1997), the presence of caulocystidia in the basal part of the stipe, which is not bulbous and shows pinkish tones, would place *I. querciphila* in section *Splendentes* Sing. subsection *Subbrunneinae*. However, like *I. querciphila*, some species in this section have very scattered or apparently absent

Colour illustrations: Inocybe querciphila habitat in Saint Jean, Corte, Corsica. *In situ* basidiomata of the holotype (AH 51897); photos of basidiospores SEM, MO; pleurocystidia; cheilocystidia; caulocystidia on upper third of the stipe. Scale bars: basidiomata = 1 cm; cystidia = 50 µm; spores (MO) = 10 µm; spores (SEM) = 2 µm.

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caulocystidia on the lower half of the stipe and could therefore be placed in section *Tardae*. A representative example of this case is *I. furfurea*, which sometimes shows caulocystidia only in the upper zone, and whose cystidia of cylindrical morphology make it clearly recognisable (Kühner 1955, Bandini *et al.* 2020).

Recently, some species have been described in which the caulocystidia are scattered or widely dispersed towards the base or apparently absent. This is the case of *Inocybe rivierana* and *I. beatifica*, which differ in the morphology of their cystidia and spores, and in the absence of distinct pink stipe colours; both are also phylogenetically very distant (Bandini *et al.* 2021). A similar case is that of *I. agroterae*, recently described from central Europe in *Picea* and *Salix* forests, with very elongate cystidia (Bandini *et al.* 2022b). *Inocybe querciphila* could also be reminiscent of *I. tjallingiorum* (= *I. subporospora*), whose stipe develops characteristic orange-brown tones, the caulocystidia are numerous along the entire stipe and the morphology of the cystidia is different (Kuyper 1986, Larsson *et al.* 2014, Bandini *et al.* 2021). Finally, the macroscopic appearance of *I. suecica* is somewhat reminiscent of that of *I. querciphila*, although it differs in having a stipe without pinkish tones, completely covered with caulocystidia, spores with a more amygdaloid morphology and a preference for calcareous soils (Vauras & Larsson 2016). In BLAST, all the species mentioned above show very clear phylogenetic differences.



Phylogram obtained using PAUP v. 4.0a (Swofford 2003) based on ITS and LSU data showing the position of *I. querciphila* among its closest relatives. Heuristic searches with 1 000 random-addition sequence replicates and tree bisection-reconnection (TBR) branch swapping were performed. Relative robustness of clades was assessed by the bootstrap method using 1 000 heuristic search replicates with 100 random taxon addition sequence replicates and TBR branch swapping. Bootstrap support values are indicated on branches. *Inocybe querciphila* is marked with a green box and the holotype indicated with an asterisk (*).

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