
Inocybe ionolepis

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Inocybe ionolepis Cullington & E. Larss., *sp. nov.*

Etymology. Refers to the purple scales on the pileus.

Classification — *Inocybaceae*, *Agaricales*, *Agaricomycetes*.

Pileus 15–35 mm diam, campanulate to obtusely conical with an obtuse to broad umbo, slightly incurved margin, expanding with age, surface silky fibrillose with large flat depressed scales as young, dark purple and brown around the umbo and purple-lilac towards the margin, contrasting to the pale whitish subpellis trama. Fading with age to become pale greyish lilac at margin. *Cortina* pale greyish white with a violet tinge. *Lamellae* moderately crowded, interspersed with lamellulae, sinuate to emarginate, first pale grey with a lilac tint, later greyish brown. *Stipe* 35–45 × 3–5 mm, equal, equal to slightly bulbous, pale with greyish lilac tint, yellowish tint at the base, pruinose at apex to 1/3 of the stipe, in lower part fibrillose, covered with thin walled hyaline hyphae 5–12 µm wide. *Smell* slightly spermatic. *Basidia* clavate, 4-spored, (21.2–)28.8(–33) × (7–)8.6(–10.3) µm. *Spores* smooth ellipsoid to subamygdaliform with obtuse apex and distinct apiculus (8.6–)9.5(–11.2) × (4.6–)5.1(–6.1) µm, Q = (1.82–)1.84(–1.96) (n = 85). *Pleurocystidia* (48–)54(–71) × (11–)14(–16) µm (n = 50), lageniform to subutriform, with pedicel, usually abundant with crystals at apex, walls 2–3.5 µm thick, mostly pale colourless. *Cheilocystidia* similar to pleurocystidia but shorter, (32–)40(–46) × (13–)16(–18) µm (n = 20), lageniform to broadly utriform, walls 2.5–4.5 µm thick. *Paracystidia* hyaline, pyriform to clavate (14–)17(–22) × (8–)9(–10) µm (n = 10). *Caulocystidia* at apex similar to pleurocystidia, abundant, with crystals, less so further down (40–)50(–70) × (14–)16(–18) µm (n = 10), fusiform to more cylindrical, caulocystidioid hairs thin-walled, sometimes septate, 40–100 × 9–12 µm, cauloparacystidia few. *Pileipellis* a compact interwoven cutis of cylindrical hyphae, thin-walled, smooth, hyaline (5–)6–10(–13) µm wide. *Clamp connections* present in all tissue.

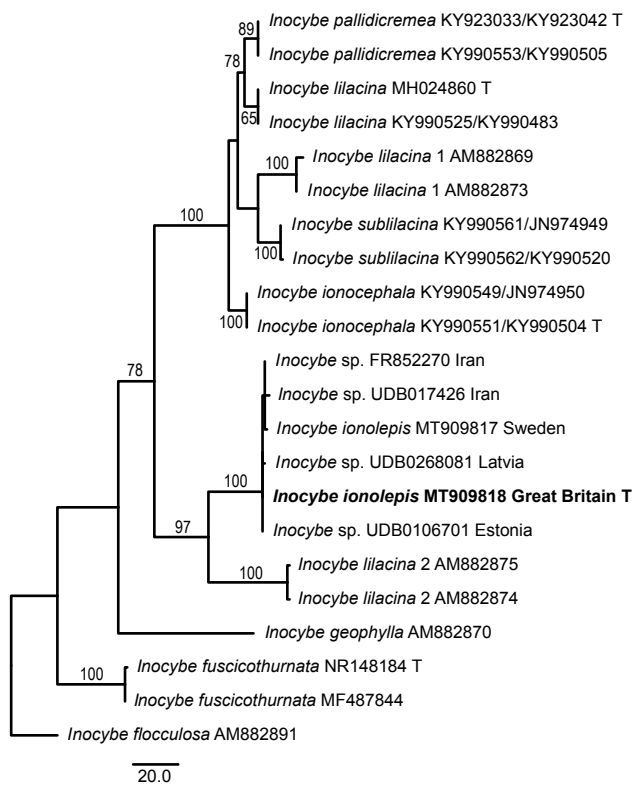
Ecology & Distribution — Associated with deciduous trees, *Fagus sylvatica* and *Quercus robur*. Basidiomata so far only known from England and Sweden, however ITS sequence data generated from soil samples show a wider distribution with occurrence in Iran, Estonia and Latvia.

Typus. Great Britain, England, Gloucestershire, Forest of Dean, near Acorn Patch, 21 Sept. 2017, *P. Cullington*, in deciduous forest on stony soil under *Fagus sylvatica* (holotype K(M)236689, isotype GB, ITS-LSU sequence GenBank MT909818, and MycoBank MB836902).

Additional material examined. Sweden, Gotland, Linde, Linde Prästänge, Forest meadow on calcareous ground, under *Quercus robur*, close to *Corylus avellana* and *Betula pendula*, 25 Oct. 2019, *E. Larsson* 279-19, GB-0207596, ITS-LSU sequence GenBank MT909817.

Colour illustrations. *Inocybe ionolepis* habitat, forest meadow Linde prästänge, Gotland, Sweden. In situ basidiomata (GB-0207596); detail of pileus scales, cheilocystidia and basidiospores (holotype K(M)236689). Scale bars = 10 µm for spores, 20 µm cheilocystidia.

Notes — *Inocybe ionolepis* belongs in the *I. geophylla* group and the purple-lilac species surrounding *I. lilacina* (Matheny & Swenie 2018). The group is identified to host a high phylogenetic diversity and the name *I. lilacina* has been applied to many taxa in Europe (Ryberg et al. 2008). The group is still in need of further investigations with solid documentation of macromorphology and ecology. *Inocybe ionolepis* is characterised by having a pileus with a brown umbo and purple-lilac scales, and a pale yellowish tint at the stipe base. In dry condition the scales are distinctive, see the cap detail bottom right photo, but the scales colour fade and is affected after rain, and maybe also by late season fruiting. The young lamellae have a distinct lilac tone, that with age are becoming greyish brown with a pale lilac tint. Blast search of NCBIs GenBank nucleotide database and the UNITE database identified five additional ITS sequences of *I. ionolepis* generated from soil samples, suggesting the species to have a broad distribution range in Europe and Iran. In the phylogenetic analysis it comes out in a sister clade to *I. lilacina* 2 from Europe (Matheny & Swenie 2018). The two sequenced collections in the *I. lilacina* 2 clade originates from deciduous forests like *I. ionolepis*, while the two sequenced collections in *I. lilacina* 1 that comes out in a sister clade to *I. sublilacina* originates from coniferous forests. This suggests that there is an ecological differentiation within the group.



Phylogram based on ITS and LSU sequence data showing the position of *I. iololepis* in the *I. lilacina* group. Bootstrap support values are indicated on branches and the sequence of the holotype is marked in **bold**. Multiple sequence alignments were carried out with MAFFT (https://mafft.cbrc.jp/alignment/server/). The alignment was checked and adjusted manually, heuristic searches and bootstrap parsimony analyses were performed using PAUP v. 4.0b10 (Swofford 2003).

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