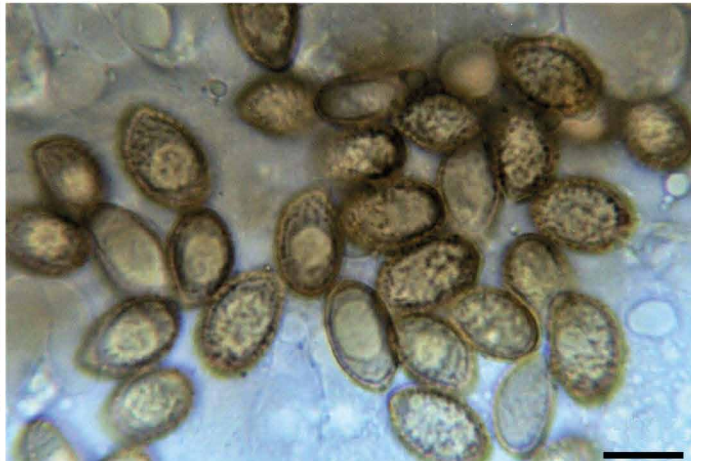


*Cortinarius paezii*



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***Cortinarius paezii*** Garrido-Benavent, Ballarà, Liimat. & Mahiques, *sp. nov.*

**Etymology.** The species is named after the Spanish Jesuit missionary Pedro Páez (1564–1622), who was the first European that visited the Blue Nile source in Ethiopia and described the natural history of this country.

**Classification** — *Cortinariaceae*, *Agaricales*, *Agaricomycetes*.

**Basidiomata** rather small. **Pileus** 10–25(–35) mm diam, at first hemispheric, later convex with a persistent, obtuse, rounded and low umbo; margin first very incurved and highly lobulated and later extended and slightly serrate, retaining whitish veil remnants; surface hygrophanous, smooth to fibrous, dark grey, dark grey-brown (Caill. T31, T30; Cailleux 1981) to ochraceous, pale ochraceous or reddish brown (Caill. M49, M35, M25) when dry; mature pilei with necropigments. **Lamellae** moderately dense, uncinated, pale ochraceous to beige ochraceous (Caill. M29, N30); lamellae edges slightly paler, and slightly mustard brown with age; lamellulae present. **Stipe** (15–)20–35(–45) mm long and 3–6(–8) mm wide, cylindrical to clavate or subglobose at the base; surface white, later pale beige, with universal veil copious towards the base, partial veil fugacious, not forming an annular area. **Context** generally fibrous, pale ochraceous, and brownish in the stipe cortex. **Taste** mild and **smell** indistinguishable. **Macrochemical reactions:** negative to KOH, guaiac tincture, Ph.A. and methol. **Basidiospores** broadly ellipsoid in front and side view, (10–)11–11.8–12.5(–13) × (6.25–)7–7.3–7.5(–8) µm in size, with a Q (length/width ratio) = (1.5–)1.55–1.61–1.73(–1.8), and with a marked apical depression; spore surface densely ornamented with projecting warts of moderate size. **Basidia** 36–45 × 9–12 µm, 4-spored; lamellar edge with basidia and some claviform cells, 26–34 × 9–11 µm. **Pileipellis** a cutis formed by a layer of 4–8 µm wide, clamped, more or less cylindrical hyphae, with scattered pale ochraceous incrusting wall pigments; **subcutis** composed of short and irregularly-arranged, septate hyphae, 30–75 × 20–32 µm; hyphae of the veil remnants 2–3 µm diam.

**Habitat & Distribution** — Restricted to the alpine belt (> 2000 m asl) in association with *Dryas octopetala*. So far found in the Pre-Pyrenees (north-eastern Iberian Peninsula). The existence of an ITS sequence in GenBank (FR852009) identical to the ones obtained in the present study indicates the presence of *C. paezii* in the Hyrcanian forests of Iran.

**Typus.** SPAIN, Catalonia, Barcelona province, Berguedà, Saldes, Serra d'Encija, Creu de Ferro, N42°18'28" E1°76'69", 2250 m asl, associated with *Dryas octopetala* on calcareous soil, 26 Aug. 2018, J. Ballarà JB-9511-18 (holotype MA-90461; ITS sequence GenBank MT184898, MycoBank MB833243).

**Colour illustrations.** Spain, Catalonia, Serra d'Encija, prairie with *Dryas octopetala* in the alpine belt, > 2000 m asl, where the holotype of *Cortinarius paezii* was collected (MA-90461). Basidiomata in upper photos correspond with the holotype; bottom left photo corresponds with MA-90460; holotype basidiospores. Scale bar = 10 µm.

**Notes** — *Cortinarius paezii* is a rather small telamonioid species with relatively large spores that we initially considered to conform to the morphological variability of *C. casimiri* due to the general size, habitat and pigmentation. However, basidiomata of the latter species are in general slenderer than those of *C. paezii*, and show reddish and somewhat lilaceous tinges, their smell is more or less raphanoid, and the spores are smaller, 10–11.5 × 6–7 µm (Brandrud et al. 1998). *Cortinarius paezii* produces hygrophanous pilei that are very dark when hydrated, without lilaceous traces, and instead shows pale ochraceous to reddish brown tinges with time. Furthermore, *C. casimiri* distributes preferentially in altimontane-subalpine habitats, and more rarely forms mycorrhizal associations with *Salix* spp. in the alpine belt. Considering other species growing in the alpine belt, *C. cavipes* would share two additional characters with *C. paezii*: the evident change in colour of pilei after drying and the clavate stipe (Favre 1955). As indicated by its epithet, however, *C. cavipes* has a hollow stipe; additionally, it shows lilaceous traces in the stipe apex and context (as in *C. casimiri*), and produces smaller, less ornamented spores.

Two additional alpine species described by Favre (1955) were *C. levipileus* and *C. rusticellus*. The former differs from *C. paezii* in producing smaller basidiomata, with a finely granulate pileus cuticle, with the surface dark to reddish brown, and by the less abundant veil remnants and the slightly smaller, more ovoid spores (lower Q value). Lamoure (1978) obtained similar values for spore size in *C. levipileus* and provided further evidence of its habitat on calcareous soils in the alpine belt. *Cortinarius rusticellus* produces spores more similar in size to those of the new species but has smaller basidiomata, pilei are more umbonate and fibrous to felty, lamellae are darker, and there is an abundant and persistent veil forming an evident annulus on the stipe.

The two ITS sequences obtained for the new species were 19 bp (plus four indels), 16 bp (plus eight indels), and 19 bp (plus six indels) different from those of *C. casimiri/subsertipes*, *C. levipileus* and *C. rusticellus*, respectively. The phylogenetic tree revealed *C. tatrensis* as a close relative of *C. paezii*. This species was described from *Salix* and *Dryas* communities in the alpine belt of the Belaer Tatras, in northern Slovakia (Fellner & Landa 1993). Apart from the similar habitat, *C. paezii* and *C. tatrensis* share the general habitat of basidiomata, the hygrophanicity of pilei and their pigmentation, and the spores, which the authors described as broadly ovoid, (10–)10.5–12.5 × (6.5–)7–8.5 µm. However, lilaceous to vinaceous tinges were originally noticed in the surface of the stipe base and in the stipe context of *C. tatrensis* while these characters are absent in *C. paezii*. Additionally, the stipe in *C. tatrensis* is described as 'cylindrical, slightly narrowing towards the base', whereas in the new species it is markedly clavate. The ITS sequence of *C. tatrensis* is provided for the first time in the present work, and shows five different nucleotides from *C. paezii* at the ITS1 region.

**Supplementary material**

**FP1073-1** Additional materials examined.

**FP1073-2** Phylogram depicting the evolutionary relationships of *Cortinarius paezii* and their relatives based on ITS sequence data.

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