

***Cortinarius cremeolaniger* Orton found in Sweden**

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During the mycologically rich year 1986 the author found, together with H.G. Toresson, a sericeocyboid *Cortinarius* that initially caused us problems to identify. It resembled a *C. laniger* but had unusually narrow spores. When I later presented the collection to M. Moser, he suggested that I investigate *C. cremeolaniger* Orton. The material conformed sufficiently with P.D. Orton's diagnosis (1983) to allow a positive identification. The finding was corroborated in 1987 by a second collection at a different locality.

Cortinarius cremeolaniger is an interesting species, for several reasons. First, it appears to be a key taxon linking the group of *C. malachius* Fr. to *C. laniger* Fr. and its relatives. Secondly, along with *C. pearsonii* Orton, it is exceptional within the complex to exhibit the above-mentioned narrow spores. Thirdly, according to our observations, it is also unique among these taxa to react with formalin. *C. lanigeroides* Orton [*loc. cit.*] is in my opinion a synonym.

N.B.; A few notes in brackets have been added after publication.

Description

Cap 8-15 cm; hemispherical, disk soon flattened, then convex with margin long involute; fleshy.

Cutis dry, non-hygrophanous; buff to brick-coloured but long covered by a pale greyish to grey-yellow, silky to fibrous layer; margin paler.

Stipe 6-11 cm × 13-25 mm; clavate to cylindrical with a dilated base; pale buff but long covered by a thick, pale grey layer, sometimes with a faint violet shade at apex as young; often with an adpressed annulate girdle at the cortinal zone.

Lamellæ bright brick to cinnamon; L= 62, 1= 2; adnate; edge paler.

Veil pale greyish yellow to grey-white, somewhat darkening, copious; cortina pure white, copious.

Flesh compact; pale grey with a yellow tinge in stipe; faintly marbled grey or violet-grey in stipe apex; larvæ perforations yellowish pink; odour and taste nil.

Reactions: NaOH, AgNO₃, FeSO₄ trivial; iodine preparations nil; formalin in flesh distinctly pink, then mauve after 5 minutes.

Spores oblong elliptical, somewhat angular in coll. A, weakly verrucose, 6.5-7.5 × 3.5-4 µm (-8 µm in coll. A); basidia tetrasporic, commensurate with frequent balloon-like basidiols, 25 × 7 µm; sterigmata 4-5 µm; cheilocystidia absent.

Epicutis of radially interwoven hyphæ 1-2 µm, with a brown, distributed pigment; velar hyphæ 5-8 µm, thick-walled (ab. 0.8 µm).

Collection A: in a mixed, calcareous forest (probably associated with *Quercus*); Kalkugnsberget, near Arboga, Central Sweden, 1986-09-02; 7 specimens in good condition, all ages (herb. KS-CO190).

Collection B: in a rich *Betula* forest, less calcareous than locality A; Tyrsta-Svartbäcken near Stockholm, Central Sweden, 1987-08-27; 5 specimens in good condition, mainly young. (leg. Ms. Alexandra Gödecke, herb. KS-CO240).

A third collection, reported from the Gothenburg area [S. Jacobsson, *pers. comm.*], most probably represents the subject taxon. I have seen no other reports of it, nor does it occur under that name in any of the larger Swedish herbaria. I have not yet investigated herbarium specimens labelled *C. laniger* or related epithets.

Related species

- C. pearsonii* Orton (= *C. malachius* ss. Pearson 1943)
C. malachius Fr. (= *C. malachioides* Orton)
C. impennis Fr. (= *C. malachius* ss. Orton ?)
C. laniger Fr.
C. alborufescens Imler
C. diosmus Kühn. (= *C. argentatus* Fr. ss Hry., ss Fr.?)
C. triformis Fr. ss. Lge (= *C. turgidus* Fr.?)
C. subargentatus Orton

Discussion

The principal characters of the present species are:

1. The characteristic spores. Most of the other species in the list have spores in the range 8-11 × 6-8 µm. One may here note that among comparable *Cortinarii*, similar spores are only found with *C. pseudocrassus* Joss. (which I suspect being synonymous with *C. opimus* Fr. var. *fulvobrunneus* Fr. [Soop 1988b]), a species resembling *C. laniger* in cap colour and dryness, which has sometimes been regarded as a *Sericeocybe*.
2. The reaction with formalin (this was only tested on collection B). One should note, however, that the *diagnosis princeps* does not report any chemical reactions. The only other *Cortinarius* I have found to exhibit this character is the well-known case of *C. caninus* (Fr.) Fr.
3. The pale yellowish veil (cf. the epithet). All other species in the list have either a pure white, greyish, or violet grey veil. P.O. Orton has described *C. lanigeroides* together with the subject species, whose only distinguishing character appears to be the pure white veil. It is possible that collection A can be ascribed to this taxon due to its slightly longer spores and brighter veil; but in my opinion this is hardly enough to maintain it as a separate species.

C. pearsonii Orton (1958), with the same narrow spores, differs only by a bluish coloration on lamellæ and at stipe apex, and it is conceivable that *C. cremeolaniger* should be regarded as a variety of this taxon (cf. Melot 1986b on the taxonomical significance of this character). Our collections agree well with the picture of *C. pearsonii* in Phillips (1981), which, according to Orton (1983) may well represent *C. cremeolaniger*.

Due to their persistent, silky veil on cap and stipe, and non-hygrophanous context, both *C. cremeolaniger* and *C. laniger* are typically sericeocyboid fungi. This author has claimed for many years (e.g. Soop 1987) that *C. laniger*, along with its relatives (*C. calopus* Karst., *C. solis-occasus* Melot, and *C. canabarba* Mos., whereas *C. bivelus* Fr. remains questionable) be accordingly placed in the subgenus *Sericeocybe* Orton (1958), and not in *Telamonia*, as maintained by many authors. Including this group agrees well with Orton's definition of the subgenus, and tends to consolidate this, to my mind, singularly valid and logical taxonomical unit. Our findings now corroborate this position, providing a link to an incontestably sericeocyboid species: *C. malachius*. Indeed, our first idea on encountering collection A was a variety of *C. laniger*, whereas collection B made us think of *C. malachius*.

Both are quite common fungi in Swedish spruce forests. To Scandinavian mycologists there is no doubt that the Friesian *C. malachius* is the taxon with rather long spores (9-12 µm) occurring all over the country, notably in the forests explored by its author. This fungus occasionally shows a weak hygrophanity of the cap, whereas the closely related *C. impennis* Fr. (which I believe to be *C. malachius* ss. Orton) is more hygrophanous, and might be considered a borderline case to *Telamonia*. The latter, rare in Sweden, is also stronger violet tinged than *C. malachius*, the veil being distinctly coloured, and has shorter spores: 7- 7.5 × 4-5 µm (herb. KS-CO162). Typically, *C. malachius* has a very weak violet coloration, sometimes totally absent, the fruit-bodies being mainly greyish to grey-brown, also in the context. In this form, the fungus merges with my conception of *C. lucorum* (Fr.) Lge, frequent in association with *Populus tremula* in Sweden (Soop

1987, cf. also Brandrud 1983). It is also in this form the species reminds the most of *C. cremeolaniger*.

[The collection KS-CO162, referred to above, is currently interpreted as *C. biveloides* Henry.]

C. laniger is distinctive by its brick-red lamellæ and the pale brick to almost pink, marbled coloration of the flesh. The flesh of *C. cremeolaniger* is paler, more greyish. Curiously enough, I have encountered a form of *C. laniger* with an intensely violet veil, covering the cap and part of the stipe, and with very dark lamellæ, growing mixed with the normal form, ostensibly from the same mycelium. Unfortunately no material was conserved from this collection, which was gathered not far from locality A, so I have been unable to ascertain whether it was a question of *C. solis-occasus* Melot (1986a), no doubt closely related.

One concludes that *C. malachus*, *C. laniger*, and *C. cremeolaniger* ss. lato (including *C. pearsonii*) all exist in forms with or without violet to bluish coloration.

I recently reported (1988a) a few collections of *C. alborufescens* Imler (herb. KS-CO8, 226, 268). It is another rare and interesting species, resembling *cremeolaniger*. Apart from the spore size, it differs mainly by a fusoid stipe and a faint, but distinct, spicy smell. The flesh has the same hue as *laniger*, but is paler. We found this fungus in a rich spruce forest near Stockholm, whereas my finds in Belgium occurred in a *Fagus* association. *C. diosmus* Kühn., which may well be the true *C. argentatus* of Fries, has been found in various localities in Sweden (herb. KS-CO256). It seems intermediate between *C. alborufescens* and *C. cremeolaniger*, with the smell reminiscent of the former, but the more clavate stipe of the latter, the spore size also being somewhere in between. The context is pale greyish brown, and the veil is sparser than that of the previous taxa. Similar, but with even paler flesh and sparser veil, is *C. triformis* Fr. ss. Lge (possibly synonymous with *C. turgidus* Fr.), also found in Belgium (herb. KS-CO180, 276).

[The latter is in fact to be interpreted as *C. turgidus*.]

Finally, in an acid *Betula* forest near Arboga, we regularly gather a pure white species in the same group (herb. KS-CO98), tentatively identified as *C. subargentatus* Orton (1958). The flesh is white (faintly blue only in young specimens), the white veil is copious, and the lamellæ are greyish, like those of *C. diosmus* and *C. triformis* ss. Lge. We first regarded this fungus as *C. argentatus* (Pers.:Fr.) Fr., but the odour mentioned by Fries (1851) is absent. It seems related to *C. alboviolaceus* (Pers.:Fr.) Fr., forming a yet another bridge to *C. cremeolaniger*.

Summary

C. cremeolaniger seems to be a rare species, to my knowledge not previously reported from Sweden. It belongs to a group of macroscopically related taxa in the subgenus *Sericeocybe*, where (along with the possibly conspecific *C. pearsonii*) it is remarkable for its narrow spores. The following table summarises the key differences within the group, according to my observations:

Taxon	Spores	Lamellæ	Context	Hygrophanity	Veil
<i>laniger</i>	9-10.5 × 6.5-7	brick	beige to pinkish	nil	copious
<i>alborufescens</i>	7-9.5 × 4.5-6.5	pale cinnamon	cinnamon to brick	nil	copious
<i>diosmus</i>	8-8.5 × 5-6	pale grey-brown	greyish beige	nil	medium
<i>cremeolaniger</i>	6.5-7.5 × 3.5-4	brick	pale grey-yellow	nil	copious
<i>malachus</i>	9-11.5 × 6.5-7	grey violet	greyish	weak	copious
<i>triformis</i> ss Lge	8-10.5 × 6.5-7.5	pale grey-brown	grey to white	weak	sparse
<i>subargentatus</i>	8.5-10.5 × 6-7	grey	white	nil	copious

[*C. alborufescens* as interpreted in the above table is currently considered a form of *C. diosmus*, whereas *C. alborufescens* is used as the priority synonym of *C. cremeolaniger*.]

References

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