

# Cortinarius lustrabilis (Basidiomycota, Agaricales), a new species to Fennoscandia

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*Cortinarius lustrabilis* Moëgne-Loec. is reported for the first time from Fennoscandia. A description of the species is provided and its ecology and distribution are discussed. The nomenclature is confirmed by sequencing the type material, and the ITS-sequences (rDNA) are compared with those in gene bank and our own sequences to see the relationships of this isolated species.

Key words: *Cortinarius*, Fennoscandia, taxonomy, ITS

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## Introduction

Seven years ago the senior author of this paper found an interesting *Cortinarius* species from a pine heath in Finland. It had characteristics of both the subg. *Phlegmacium* (Fr.) J.G. Trog and the sect. *Vibratiles* Melot in the subg. *Myxacium* (Fr.) J. G. Trog. Later on it turned out to be *Cortinarius lustrabilis* Moëgne-Loec., a *Vibratiles* species described from France (Bidaud et al. 2000). The species has also been reported from Germany (Laber 2003). In this paper the description of the species is given and in addition the taxonomy, ecology and distribution are discussed.

## Material and methods

The holotype as well as the own material of *Cortinarius lustrabilis* were studied. Macroscopic characteristics were observed from the fresh fruitbodies. Colour codes were not used, but instead a colour photograph of *C. lustrabilis* is provided. The microscopic characteristics were examined as in Niskanen et al. (2006) with one exception – the

spores were measured from the gill, because no good spore deposits were found at the top of the stipe or veil. The spore sizes given in the comments for different species are based on our own measurements. The acronyms follow those used by Holmgren et al. (1990).

All the known collections of the studied species (n=3) from Fennoscandia and the type material of *Cortinarius lustrabilis* were sequenced. The protocols for DNA extraction, amplification and sequencing follow the methods used in the earlier study by the authors (Niskanen et al. 2006). The GenBank accession numbers are provided in the list of specimens examined. The sequences were aligned using the ClustalW 1.8 program (Thompson et al. 1994) on the European Bioinformatics Institute server (<http://www.ebi.ac.uk/clustalw/index.html>) and compared to those in public gene banks (GenBank: <http://www.ncbi.nlm.nih.gov/> and UNITE: <http://unite.zbi.ee/>) and own sequences to find identical or close sequences.

***Cortinarius lustrabilis* Moëgne-Loec. – Figs. 1, 2**

*Cortinarius lustrabilis* Moëgne-Loec., Atlas des Cortinaires 10: 492. 2000. – Type: France, Hau-

te-Savoie, Les Puisots, under *Picea abies* among mosses, alt. 700 m a.s.l., 26 Oct 1989 *P. Moënne-Loccoz 1226* (holotype, PC).

*Illustrations:* Atlas des Cortinaires 10, pl. 294.

*Pileus:* 4.0–5.5 cm, convex with slightly down-curved margin when young, with age plano-convex, sometimes depressed in the middle; surface somewhat viscid, smooth, whitish from veil towards the margin, sometimes with white veil patches near the edge; vivid apricot-yellow to more red-brown, hygrophanous, at least at first rimy fibrillose due to drying, in contrast with the wet and darker background. *Lamellae:* moderately crowded to crowded (45 to 55 reaching the stipe), yellow-brown when young, more colourful with age, fairly narrow, edge somewhat lighter. *Stipe:* 6.5–9.0 × 0.7–1.2 cm, cylindrical, tapering downwards to slightly clavate, thinly covered with white silky fibrils which soon disappear revealing the yellow context, surface dry.

*Mycelium:* white. *Veil:* white, sparse, slightly viscid (no personal observations). *Context:* yellow. *Taste:* slightly bitter at least in the cap context. *Smell:* indistinct. *Exsiccata:* cap grey-brown to more vivid red-brown, stipe greyish-white, context still yellowish, mycelium white.

*Spores:* (8.3)8.5–9.5(10.1) × 5.1–5.9(6.4) μm, Q=(1.49)1.54–1.72(1.79) (80 spores, 4 collections, Fig. 2),  $\bar{X}$ =8.8–9.3 × 5.4–5.7 μm,  $\bar{X}Q$ =1.62–1.66, ovoid to amygdaliform, rather thin-walled, faintly dextrinoid, finely to moderately and separately verrucose, more strongly at the apex. *Hyphae of the gill trama:* in the overall view yellowish, finely to more strongly zebra-striped incrustated, with small, colourless crystals, in the holotype the crystals appear in tree-like structures in other specimens they are solitary. *Basidia:* 4-spored, 25–35 × 7–10 μm, some with golden-yellow contents. *Pileipellis:* with a rather thick, gelatinized epicutis, uppermost narrow (2–5 μm) finely incrustated hyphae, some with golden-yellow contents, lower broader hyphae



Fig. 1. *Cortinarius lustrabilis*, Norway, Hordaland, Ulvik commune, Stokkavattnet, by the Espelandselv, 2005 *Niskanen 05-218* (H). Photo K. Liimatainen.

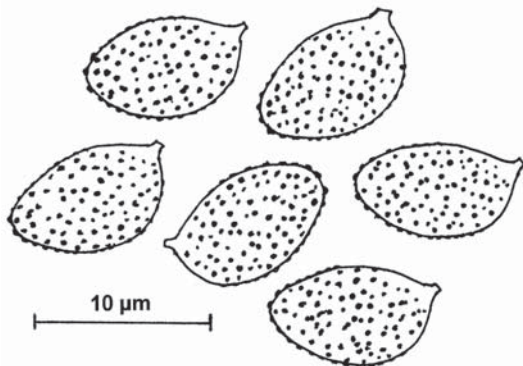


Fig. 2. Spores of *Cortinarius lustrabilis* (holotype, PC). Drawings T. Niskanen.

(5–15  $\mu\text{m}$ ) with distinct yellow-brown zebra-striated incrustation; hypoderm well-developed with elongated thin-walled, and finely incrustated elements about  $40\text{--}60 \times 15\text{--}25 \mu\text{m}$ . *Clamp connections*: present.

*Type material*: The part of the holotype includes only one half pileus, which is in good condition.

*ITS-regions* (including 5.8S region): 601 bases long (total 4 sequences). In one sequence (*Niskanen 05-235*) one base change and 2 indels were observed, otherwise there was no intraspecific variation.

*Ecology and distribution*: *Cortinarius lustrabilis* is known from Finland, Norway, France and Germany (Laber 2003, sequence AY669586 in GenBank, collection not studied). It grows in coniferous forests among mosses; the holotype was collected under *Picea abies* and our own collections are from a spruce-dominated forest with pine, and from a sandy pine heath. In all the localities the soil is fairly acid. Because there is only one known collection of *C. lustrabilis* from Finland so far, we suggest it to be placed in the IUCN-category DD.

## Discussion

*Cortinarius lustrabilis* is characterized by its hygrophanous striate vivid apricot-brown pileus, yellow context with slightly bitter taste, and medium-sized amygdaliform spores. Whether the viscosity of the cap is mild, as said in the original description, was not observed by us. Otherwise the original description fits well to our own ob-

servations. There are no significant contradictions with the description of Laber (2003, material not studied) either.

Based on the ITS sequences *C. lustrabilis* seems to be well delimited from other known *Cortinarius* species. The specimens from Finland, France and Norway are identical. The GenBank sequence AY669586 from Germany, differs by one base, but we have not seen the chromatogram to be sure of the nucleotide difference. Interesting, however, is that the collection *Niskanen 05-235* from the same forest as *Niskanen 05-218* had one base change and two indels compared to the others. The fruitbodies of the former had slightly more red-brown pileus than observed in the other collections, but otherwise no morphological differences were noticed. Since we know that there are morphologically accepted *Cortinarius* species, which have only one base pair difference (unpublished), this raises a question whether this deviating collection belongs to *C. lustrabilis* s. str. Further morphological and genetic studies are needed to fully understand the variation of this clade.

*Cortinarius lustrabilis* recalls the rather common pine forest species, *C. pinophilus* Soop 1993. The latter is whitish when young but becomes soon apricot-yellow. The stipe is clavate, sometimes almost bulbous, and the taste is mild. The cap is not equally hygrophanous striate as in *C. lustrabilis*, and the spores are ellipsoid and more strongly verrucose ( $8.6\text{--}9.5 \times 5.7\text{--}6.4 \mu\text{m}$ ). The bitter taste and yellow-brown colours make *C. lustrabilis* similar to the species in the sect. *Vibratiles*. *C. lustrabilis*, however, is bigger than the most Fennoscandian *Vibratiles* species and has larger spores. The rimy pileus can also remind *C. variegatus* Bres. 1884, which on the other hand has stouter fruitbodies, reddening veil, and narrow, smooth spores ( $6.8\text{--}7.8 \times 3.5\text{--}4.1 \mu\text{m}$ ).

*Cortinarius lustrabilis* was described as a species belonging to the section *Vibratiles* (Bidaud et al. 2000). It was included in the phylogenetic study of Garnica et al. (2005), which revealed that it was not closely related to *C. croceocaulus*, the another representative of section *Vibratiles*. Furthermore, sequence comparison to the gene bank and our own sequences showed that *C. lustrabilis* has no close relatives and it seems to be a fairly isolated species. The closest taxa in pairwise comparison were e.g. *Thaxterogaster*

*albocanus* (AF325599), *Dermocybe austroveneta* (AF112147) and some *Phlegmacia*, all differing with more than 30 base changes. Since we have only limited sequence data of *Phlegmacia* and *Myxacia* species, a more precise study of the systematic position of *C. lustrabilis* could not be done at the moment. Further studies are necessary to clarify the relationships.

**Specimens examined:** **NORWAY. Hordaland:** Ulvik, Stokkavattnet, by the Espelandselv, planted *Picea abies* forest with some *Pinus sylvestris*, 24 Sept 2005 leg. T. E. Brandrud & T. Jeppesen, *Niskanen 05-218* (H, DQ652234); 26 Sept 2005 leg. E. Bendiksen, B. Dima, I. Kytövuori, K. Liimatainen & T. Niskanen 05-235 (H, DQ652235). – **FINLAND. Kainuu:** Kuhmo, Saksanlampi, pine heath forest on sandy soil, 30 Aug 1999 *Kytövuori 99-704* (H, DQ652233). – **FRANCE. Haute-Savoie:** Les Puisots, under *Picea abies* among mosses 26 Oct 1989 *P. Moëgne-Loccoz 1226* (part of holotype, PC0088377, DQ652236).

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