Conocybe nemoralis n. sp., a New Species of the Agaricales from Northern Finland

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Abstract. The new species *Conocybe nemoralis* Harmaja (Agaricales, Bolbitiaceae) is described, based on a collection from northern Finland. The species belongs to subgenus *Pholiotina* (Fayod) Kühn. sect. Vestitae Watl., and occurs in spring in moist grass-herb forest in decaying plant litter and on mull. Among other things, observations on the responses of the spores and basidia of the species to cotton blue and acetocarmine are presented, apparently for the first time as far as species of the genus *Conocybe* Fayod are concerned.

Conocybe nemoralis Harmaja n. sp.

Pileus 1.5—2.0 cm latus, olivaceobrunneus, e campanulato expansus deinde convexus, margine appendiculato. Stipes 4—6 × 0.15—0.3 cm, tenuis, sine annulo. Lamellae subferrugineae. Odor et sapor inconspicua. Sporae 10.0—12.5 × 5.0—6.3 µm, ± ellipsoideae, laeves. Basidia 18—30 × 7.0—9.0 µm, cum quattuor sporis. Cheilocystidia fusoideo-ventricosae vel subcapitatae, 15—30 × 6.0—9.0 × 2.5—5.0 µm; caulocystidia multiformes sed non capitatae. — Typus: Finland, prov. Kuusamo, par. Kuusamo, Oulanka National Park, Tulilammenpuro, 1968-06-19, Harmaja (H).

Pileus 1.5—2.0 cm broad, hygrophanous, not pruinose, in the moist condition translucent-striate up to $^1/_2$—$^2/_3$ of the pileus radius, when moist dirty brown with olivaceous tinge, when faded ochraceous except for disc which is red-brown, when dry rather bright rusty brown, 12 F 9, 13 H 11 (Maerz & Paul 1950), disc also then darker than remainder, campanulate-convex when young, expanding somewhat in age and becoming rather low convex, papilla not sharply delimited, present in disc; margin bent down in young caps becoming almost horizontal in age, partly appendiculate with minute whitish easily detached membranous scales which often, however, are absent in old caps; surface dry but somewhat slippery, rather mat, otherwise smooth and glabrous but in places with small appressed velar remnants (see above) along the margin (they are arranged to form fragments of a circle on the margin surface in those places where they are not hanging at the very margin, or edge).

Stipe 4—6 × 0.15—0.3 cm, hygrophanous, in the moist condition distinctly paler than moist pileus, being equally brownish throughout when intact, with the base darkening soon and finally assuming about

the colour of moist pileus (but usually slightly more reddish-tinged brown) in picked-up basidiocarps, when dry for the most part pale brown and paler than pileus except for the base which is ± dark brown and darker than pileus, curved to somewhat sinuous, weakly enlarged downwards, at the base somewhat more clearly so, very base obtuse, hollow already when young, terete or compressed; surface dry, moderately shining, with pale fine ± fibrillose coating except for the apex which is beset with very minute granules, annulus lacking completely in all stages; at the base scanty whitish tomentum.

Lamellae adnate with velum (!) in young basidiocarps, seceding in age, hygrophanous (beginning to fade from their bases onwards), in the moist condition dirty reddish brown being almost concolorous with pileus but possessing less olivaceous tint, when dry rusty brown being somewhat darker than pileus, arranged in 3 verticils, close, ca. 25 reach the stipe, being broadest in the middle or proximally, 4—5 mm, not forked or intervenose; edges whitish, weakly crenate.

Context hygrophanous, when moist concolorous with pileus (in pileus) or stipe (in stipe), when faded concolorous with faded pileus (in pileus), rather fragile, darkens faintly on pressing.

Odour even when bruised not distinct, "fungoid", weakly unpleasant. Taste mild, "fungoid"

Spores (in 5% KOH unless otherwise indicated; responses of the spores as well as basidia and gill trama hyphae to acetocarmine were tested on boiled piece of dry unfixed lamella with the presence of good supply of iron ions) 10.0—12.5×5.0—6.3 μm; red-brown when mature, with many, mostly immature, pale brown ones, roughly concolorous in Melzer's solution; single when mature but a few tetrads and dyads, mostly with ± collapsed immature spores, present; obtuse-based; slightly flattened, very weakly almond-shaped in side view (ca. 50% indistinctly broadest in the middle and ca. 50% indistinctly near base), in face view most moderately to rather narrowly elliptical with the rest weakly and rather narrowly ovate; plage very indistinct, very small and only applanated, smooth; wall ca. 0.4—0.7 μm thick, smooth, brown, weakly (but without any doubt) carminophilic at least in immature spores, strongly cyanophilic in immature spores, the cyanophily weakening in age and the wall becoming cyanophobic in fully mature spores except for the germ pore where a pale blue staining area remains (apparently a remnant of an outer continuous strongly cyanophilic layer which seems to surround the immature spores); germ pore present at spore apex, distinct, central, 1.0—1.5 μm in diameter; hilar appendage small, ca. 0.8—1.0×0.6—0.8 μm, hyaline, its wall carminophobic in all stages and cyanophobic at first but becoming weakly cyanophilic towards maturity; nuclei carminophobic (Fig. 1a).

Basidia 18—30×7.0—9.0 μm, broadly clavate to narrowly pyriform, four-spored; wall carminophobic, weakly cyanophilic; nuclei carminophobic to weakly carminophilic; ER vesicles carminophobic, i. e., carminophilic granulation lacking.

Hymenophoral trama ± regular, with distinct mediostratum; hyphal walls hyaline to very faintly brownish; nuclei carminophobic to weakly carminophilic.

Cystidia. Cheilocystidia present, fusoid-ventricose, often slightly enlarged towards their apices a few even being subcapitate, usually more or less asymmetric, 15—30×6.0—9.0×2.5—5.0 μm (length× broadest diameter×neck diameter); apices obtuse with a diameter of 3.0—5.0 μm; neck of variable length (Fig. 1b). Pleurocystidia absent.

Anatomy (in 5% KOH). Pileus cortex a hymeniderm of pedunculate pyriform cells with abtruncate apices, 20—35 μm high and 15—27 μm in diameter; walls not gelatinized, hyaline otherwise but

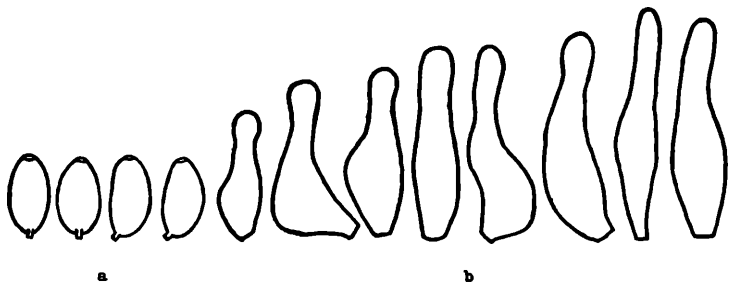

Fig. 1. *Conocybe nemoralis* HARMAJA. — Magnification 1000×. —a) Spores, b) Cheilocystidia (5% KOH)

distinctly brown in basal part. Pileus trama of rather narrow rather interwoven hyphae which possess brown walls in the upper half and pale brown ones in the lower half. Stipe cortex, more abundantly towards stipe apex, with mostly ± asymmetric caulocystidia of rather variable shape, filiform to clavate, often sinuous and usually subcapitate (with a few almost capitate but neck also then rather thick).

Ecology. Found in a ravine growing in sparse groups in several places in moist grass-herb brookside forest — most probably yearly flooded over in early spring — on calcareous soil. Substrate variable: 1) mostly litter essentially composed of leaves of deciduous trees (*Alnus incana, Prunus padus* etc.), usually in the stage of rather advanced decay, 2) not infrequently ± bare mull, and 3) at times dead decaying parts, at least petioles, of the fern *Diplazium sibiricum* (*Athyrium crenatum*). Among immediate accompanying plants, besides the above ones, *Viola selkirkii* deserves to be mentioned; the ravine as a

whole possesses an unusually rich flora of various plant groups and fungi with many calcicolous species as well as distinctly southern or northern species (see HARMAJA 1974 and 1976). About middle of June, when still spring at that latitude.

Distribution. Southern part of the northern boreal zone (AHTI & al. 1968), ca. 215 m above the sea level. Northern Finland.

Discussion. This new species distinctly belongs to *Conocybe* FAYOD subg. *Pholiotina* (FAYOD) KÜHN. sect. Vestitae WATL. *C. nemoralis* possesses the diagnostic features of that section in the amended sense (WATLING 1971), not in its original circumscription (WATLING 1965).

It is a very interesting feature that the spore wall is cyanophilic at first but becomes cyanophobic towards maturity while it gets pigmented. According to the above description, the mature spores possess, however, two weakly cyanophilic areas: the hilar appendage and the germ pore area. Anyway, according to my preliminary observations, these responses to cotton blue of spore wall, hilar appendage and possible germ pore area in dark-spored Agaricales seem to be very common. The carminophily of immature spore wall appears more surprising as this character is usually positively correlated with the presence of carminophilic granulation in the basidia. However, so far the dark-spored genera are very insufficiently examined in this respect. According to my observations the cyanophily of the basidial wall is not uncommon in the Agaricales. The responses to cotton blue and acetocarmine described above for *C. nemoralis* are apparently the first ones recorded in the genus *Conocybe*.

It is also worth while emphasizing that the habitat of the species in the Oulanka National Park is in completely virgin state without the slightest traces of human activities, in contrast to the regular habitats of most of the species of *Conocybe*. The vernal fruiting of *C. nemoralis* is also an apparent diagnostic character. At the time of collecting the specimen spring still prevailed in the Kuusamo district; the orchid *Calypso bulbosa* was in bloom and *Gyromitra esculenta*, *Byssonectria aggregata*, *Nannfeldtiella aggregata*, *Pseudoplectania nigrella*, *Sarcosoma globosum*, and some other typically vernal fungi were observed, too.

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