NOTULAE AD FLORAM AGARICINAM NEERLANDICAM — IV-V

Clitopilus and Leucopaxillus

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A neotype is designed for Clitopilus scyphoides (Fr.) Sing., an older synonym of C. cretatus (Berk. & Br.) Sacc. Clitopilus intermedius Romagn. is reduced to a variety and C. omphaliformis Joss. to a form of C. scyphoides. One new forma is described, viz. Clitopilus scyphoides f. reductus. Two new species of Clitopilus, viz. C. fasciculatus and C. daamsii are described, and an account is given of Clitopilus hobsonii and its synonyms and misapplications. A new species of Leucopaxillus, L. cutefractus, is described from the coastal dunes of the Netherlands.

IV. Clitopilus


The epithet Clitopilus has been introduced for the first time by Fries (1821: 194) for a tribus within the genus Agaricus characterized by a clitocybeoid habit and a pinkish spore-deposit. Fries devided this tribus into two subtribus, viz. Rhodopolii and Plutei. In accordance with the International Code of Botanical Nomenclature (I.C.B.N.) art. 22.4 these subtribus are to be typified with Agaricus rhodopolius and A. pluteus respectively. Consequently a lectotype for tribus Clitopilus must be chosen from these two species, and, when raised to generic rank, Clitopilus (Fr.: 1821) becomes a synonym of Entoloma resp. Pluteus.

Donk (1949) defended the thesis that Fries introduced the name Clitopilus a second time for a different tribus when Fries (1838) transferred most of the species of his first tribus Clitopilus (1821) to the tribus Entoloma and Pluteus and in the meantime replaced the old tribus name Mouceron by Clitopilus. Apparently Fries considered the name Clitopilus available again for a new group of species. According to the I.C.B.N. art. 48.1 the name Agaricus tribus Clitopilus Fr. 1838 must be considered a later homonym of Agaricus tribus Clitopilus Fr. 1821. Furthermore the name Agaricus tribus Clitopilus Fr. 1838 is not validly published, according the I.C.B.N. art. 33.4, as 'tribus' is a misplaced term for an infraspecific taxon.¹

¹ By way of exception, however, Fries' tribus names in Systema mycologicum are to be considered validly published (I.C.B.N. art. 33.5).
Kummer (1871) created the genus *Clitopilus*, which agrees with *Clitopilus* Fr. 1838, and consequently with *Agaricus* tribus *Mouceron* Fr. 1821. As a consequence of the invalid status of the name *Agaricus* tribus *Clitopilus* Fr. 1838, Kummer must be considered the author of the generic name *Clitopilus*. According to I.C.B.N. art. 72 (esp. note 1) *Clitopilus* Kumm. must be considered as a new name and has to be cited as *Clitopilus* Kumm. without reference to the invalidly published name *Agaricus* tribus *Clitopilus* Fr. 1838. *Clitopilus* Kumm. is lectotypified (Donk, 1949) by the type of its nomenclatorial ancestor *Agaricus* tribus *Clitopilus* Fr. 1821, viz. *Agaricus prunulus* Scop.: Fr.

**Clitopilus scyphoides** (Fr.) Sing.


Missapplied names. — *Pleurotus mutillus* (Fr.) Gill, sensu Gill., Hyménom. Fr.: 344. 1876; J. Lange, Fl. agar. dan. 2: 71—72, pl. 79 C. 1936.


Neotype-study of *Clitopilus scyphoides* (Fig. 1).—

Fungi Exsiccati Suecici 707, Upland, Upsala, Slottsbacken, 22 July 1938, Seth Lundell. On bare soil, in sparse lawn amongst *Trifolium repens* etc. under frondose trees (Neotype, design. mihi, C.).


Type-study of *Agaricus cretatus*.—

Herbarium Mycologicam Berkeleyanum 850, Aug. 20, 1860, Kevii Cliff (K).

Spores 6—8.5 x 3.2—4.5 μm, ellipsoid in outline with 5—8 distinct ribs. Intact basidia not found.

The holotype of *Agaricus cretatus* is in rather poor state, and consist of about 8 specimens with omphalinoid habit, glued to a piece of paper. The spores, however, agree perfectly with the common interpretation of *Clitopilus cretatus* of modern authors. In the preparations also rounded, rough spores, 6—8 μm in diameter were found, most pro-
bably from a mould. It is almost certain that Massee (1893: 245) saw these spores when he studied the type of *Agaricus cretatus*.

I agree with Singer (1946: 554) that *Agaricus scyphoides* most probably represents the same fungus as *Agaricus cretatus*. The descriptions of Fries (1821, 1874, and espe-
cially the plate of Fries (1867) leave no doubt that *Agaricus scyphoides* has a pink sporeprint. For that reason I select Fungi Exsiccati Suecici no. 707 as neotype.

Orton (1960) and J. Lange (1936) have another concept of *Agaricus scyphoides* Fr., viz. a species of *Clitocybe* sect. *Candidantes* unknown to me.

The use of the epithet *mutillus* Fr. for a species of *Clitopilus* is rejected as according to Th. Kuyper (1984; in prep.) and myself, this name applies to a species of *Omphalina*.

### KEY TO THE INFRASPECIFIC TAXA OF *CLITOPILUS SCYPHOIDES*

1. Habit omphalinoid; stipe generally central, rarely excentric, but always well-developed . . . . . . 2
2. Smell and taste mealy; spores 6.6—8.5 × 3.5—4.8(--5.2) μm, average 7.3 × 4.2 μm . . . . . . . . 3
3. Smell fruit-like, spores 7—10 × 3.5—5.3 μm, average 8 × 4.5 μm . . . . . . . . . . . . . . . . . var. *intermedius*
4. Pileus 5—25 mm broad; stipe up to 20 × 0.5—1.5(--2) mm; spores 6.6—8.5 × 3.5—4.8(--5.2) μm var. *scyphoides* f. *scyphoides*
5. Pileus 3—7 mm broad; stipe 5—8 × 0.5—0.8 mm; spores 6.2—7.3 × 3.5—4.2(--5.3) μm var. *scyphoides* f. *omphaliformis*

### Clitopilus scyphoides (Fr.) Sing. var. *intermedius* (Romagn.) Noordel., *comb. nov.* — Fig. 4


Basidiocarps small to medium-sized. Pileus 9—22 mm broad, irregularly convex to plano-convex, sometimes reniform, slightly depressed to infundibuliform, with involute margin, pure white, not striate, minutely felty under lens. Lamellae *L* = 22—35, *I* = 5—7, very crowded, arcuate-decurrent, narrow, white then pink with entire, concolorous edge. Stipe 5—12 × 1—2 mm, central of slightly excentric, cylindrical or slightly tapering downwards, white, subpruinose all over. Flesh thin, white. Smell spontaneously faintly to distinctly fruity and pleasant, like some species of *Clitocybe*, not farinaceous. Taste soap-like to subfarinaceous.

Spores 7—10 × 3.5—5.3 μm, average 8 × 4.5 μm, broadly ellipsoid in outline, *Q* = 1.55—1.75—2, with (3—)4—8 ribs. Basidia 17—27 × 6—8 μm, 4-spored. Cystidia none. Pileipellis a thin, poorly developed cutis of 2—9 μm wide, interwoven hyphae, gradually passing into pileitrama. Pigment absent. Clamp-connections absent.

Habitat & distribution.—Terrestrial in (coniferous) forest on rich, calcareous or loamy soil, rare. Known to occur in France and Belgium.


*Clitopilus scyphoides* var. *intermedius* differs from the type-variety mainly in the fruity smell and slightly larger spores, which in my opinion does not justify distinction on species level. It seems to be much more rare than the type-variety; most probably it prefers richer soils.
Clitopilus scyphoides forma omphaliformis (Joss.) Noordel., *comb. nov.* — Fig. 3


*Clitopilus scyphoides* f. *omphaliformis* differs from the type-forma only in having very small basidiocarps and perhaps slightly smaller spores, differences without much taxonomic value.

Clitopilus scyphoides forma reductus Noordel., *forma nova.* — Fig. 2

*Clitopilus omphaliformis* forma calathinoides Locq. in Bull. mens. Soc. linn. Lyon 13: 107. 1943 (nom. nud., no lat. diagn.).


Pileus up to 10 mm broad, circular when very young soon excentric conchiform, often with slightly depressed centre, pure white, subpubescent to subfreted under lens. Lamellae fairly crowded, decurrent, fairly broad, white to pale isabella with entire, concolorous edge. Stipe not more than 1.5 x 1 mm, centric when young soon excentric to lateral, sometimes lacking, white. Smell unknown. Sporeprint fairly dark flesh-pink.


Habitat & distribution. — Terrestrial in (deciduous) forest, rare. Known to occur in France and the Netherlands.

Clitopilus scyphoides forma reductus differs from the type forma in having, small reduced basidiocarps. It can be distinguished from Clitopilus hobsonii in having narrower spores.

**Clitopilus fasciculatus Noordel., spec. nov.** — Figs. 5, 10

Basidiomata fasciculata; fasciculae usque ad 70 mm latae; pileus ad 24 mm longus et 20 mm latus; tubuliformus demum irregulariter flabellatus, margine inflexus, pallide brunneus, albidus pubescentus vel albido-arachnoideus; lamellae confertissimae, angustae, ad 1 mm latae, interdum furcae fere meruloidae, pallide cremeae demum brunneo-incarnatae; stipes desunt; odore saporeque acidulo-fungoidea. Sporae 4.7–6.3 × 3.0–3.5(–4) μm, ellipsoideae, paulisper 3–6 costatae; basidia 4-sporigera; cystidia nulla; pileipellis cutis vel ixocutis, hyphae cylindraceae, 2–4 μm latae; hyphae tramarum cylindraceae, ad 4 μm latae, fibulae desunt.

Ad lectum agaricinum cultivatum. — Holotypus: 'A. v. Zaayen, 15-V-1979, Mushroom growing Experimental Station, Horst, prov. Limburg, the Netherlands' (L).

Basidiocarps fasciculate; fascicules up to 70 mm broad; individual pileus up to 24 mm long and 20 mm broad, when young more or less tubular, then fan-shaped with inflexed margin, pale brown (buff) covered with white pruinose-arachnoid covering; lamellae very crowded, very narrow, up to 1 mm broad, strongly undulating near the base giving an almost meruloid impression, very pale buffy cream near pileus, lower part more brownish-incarnate (2.5 Y 8/4, then 10 YR 8/3–7/4); stipe lacking; flesh thin, up to 0.7 mm thick, somewhat glassy; smell acrid-fungoid when crushed; taste somewhat acrid-fungoid. Spores 4.7–6.3 × 3.0–3.5(–4) μm, ellipsoid with 3–6 weak ribs, basidia 4-spored; cystidia absent; pileipellis a cutis with some uplifted hyphae with transitions to an ixocutis, made up of 2–4 μm wide, cylindrical hyphae; pileitrama densely interwoven with radial tendency, made up of 2–4 μm wide, cylindrical hyphae; pigment not seen; clamp-connections absent.
Habitat & distribution.—On beds of cultivated mushrooms (*Agaricus* spp.). So far only known from the Netherlands.


*Clitopilus fasciculatus* has a very remarkable growth-form, as it forms large cauliflower-like fascicules on growing-beds of cultivated mushrooms (*Agaricus* spp.). By this growth-form and the very small spores it can be distinguished from *Clitopilus passeckerianum* (Pilát) Sing., another *Clitopilus* from mushroom-beds. The spores of *Clitopilus fasciculatus* are the smallest recorded so far from the genus *Clitopilus*.

*Clitopilus daamsii* Noordel., *spec. nov.* — Fig. 6

Speciem nomine *Clitopilus hobsonii* sumulans sed sporis majoribus, (7-)8.1–11.5(−12.7) × 4.5–6.6(−7.0) μm. — Holotypus: *J. Daams s.n.*, XI-1966; 'Ankeveen, prov. Noord-Holland, Netherlands' (L).

Basidiocarps small, 2–8 mm broad, initially centrally or laterally stipitate then without stipe and sessile. Pileus convex to irregularly flattened with involute to inflexed margin, white, densely woolly-tomentose. Lamellae distant, L = (4-)6–15, accidently forked or anastomosing and slightly reduced, white then pink or flesh-colour with concolorous, entire edge. Stipe, if present, very short, up to 1.5 × 1 μm white, pruinose. Smell not known.

Spores (7-)8–11.5(−12.7) × 4.8–6.6(-7) μm, average 9.5 × 5.7 μm, Q = 1.4–1.75–2.0, ellipsoid in side-view with 6–9 ribs. Basidia 17–25 × 6–9 μm, 2- and 4-spored, more or less equally distributed in hymenium, or all 4-spored. Cheilocystidia absent but frequently trimal hymphae protruding from hymenium, especially in old specimens, forming 2–3 μm wide cylindrical hairs along the edge. Hymenophoral trama very thin, more or less regular, made up of 2–4 μm wide, cylindrical hyphae. Pigment absent.

Habitat & distribution.—On wood and other fungi (e.g. *Hymenochaete tabacina*). So far known from Denmark and the Netherlands.

*Clitopilus daamsii* resembles *C. hobsonii* very much in having a strongly reduced often sessile basidiocarp, but differs microscopically in having much larger spores. Some collections have mixed 2- and 4-spored basidia, others exclusively 4-spored basidia, but even in the latter the spores are distinctly larger than in *C. hobsonii*. For this reason I consider it a taxon with the rank of species, and not a mere variety of *C. hobsonii*.

I have named this tiny *Clitopilus* after Jasper Daams, former president and present honorary member of the Netherlands' Mycological Society, to honour his great stimulating influence on Netherlands mycology over almost 50 years.

*Clitopilus hobsonii* (Berk.) P. D. Orton. — Fig. 7


*Octojuga fayodii* Konr. & Maubl., Icon. sel. fung. 6: 234. 1934.


Study of the holotype of *Clitopilus hobsonii*. — Spores 6.0—9.0 × 4.0—5.5 μm, ellipsoid in outline, with 7—10 indistinct ribs. Material too poor for the interpretation of other microscopical characters.

Fig. 7. *Clitopilus hobsonii*. — Habit (x 3) and spores (x 2100). (Habit from M. E. Noordeloos 1701, spores from holotype).

Fig. 8. *Leucopaxillus cutefractus*. — Habit (x 1.5), spores (x 2100) and cheilocystidia (x 1400). (All figs. from holotype).
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Fig. 9. *Leucopaxillus cutefractus.* — Habit (from holotype).

Fig. 10. *Clitopilus fasciculatus.* — Habit (from holotype).
From the type-study it is evident that Clitopilus hobsonii is a good species of Clitopilus, and the oldest valid name for Octojuga pleurotelloides Kühner.

Clitopilus pinsitus sensu Josserand (l.c.) most probably represents a luxurious form only of C. hobsonii. I have ranged it among the misapplied names awaiting other evidence. Clitopilus hobsonii is a common species growing terrestrial or on debris of herbaceous or woody plants. The lamellar edge is usually fertile, but occasionally filiform, 2–4 μm wide 'hairs' have been observed, which possibly are of trammal origin (compare C. daamsii).

Clitopilus scyphoides f. reductus resembles C. hobsonii very much, but can be distinguished by its narrower spores.

V. Leucopaxillus

Leucopaxillus cutefractus Noordel., spec. nov. — Figs. 8, 9


Pileus 40–120 mm broad, thick-fleshed, rounded conico-convex then expanding to almost flattened, usually with broad umbo, more rarely with slightly depressed centre, with involute margin, in marginal zone somewhat irregular lobed or wavy with age, not hygrophanous, not striate, pale isabella creamy with whitish margin of entirely isabella-ochraceous, at centre sometimes slightly darker tending to leather brown, dry, entirely felted-tomentose when young sometimes minutely ribbed and fluffy at margin, becoming areolate-craqued to 'pseudo' squamulose with age, more or less glabresent in moist weather. Lamellae moderately crowded decurrent, narrow to fairly broad (4–10 mm), often anastomosing, especially in basal part on stipe, pallid, almost white and remaining so on drying, with minutely pruinose-fimbriate, concolorous edge. Stipe 25–60 × 8–22 (–30) mm, usually strongly swollen towards base but extreme base mostly attenuated and almost rooting, white or whitish with isabella-creamy spots, flocculose-squamulose at first then fibrillose-streaky to minutely ribbed, at base white tomentose. Flesh very firm, white. Smell variable, usually sweetish, subaromatical, sometimes slightly rancid-acrid or subfarinaceous, unpleasant. Taste strong, difficult to describe but mild. Sporeprint slightly creamy-pinkish.

Spores 6.3–8.1 (–8.6) × 4.5–5.9 (–6.3) μm, average 7–7.6 × 5.5 μm, Q = (1.1–) 1.3–1.4 (–1.7), (broadly) ellipsoid in outline, covered with small, rounded, strongly amyloid warts. Basidia 24–52 × 8–11 μm, 4-spored. Cheilocystidia numerous, rendering lamellar edge usually entirely sterile, irregularly cylindric-flexuose, sometimes with some apical excrescencies subcoralloid, 2.5–5 (–6) μm wide. Pileipellis a cutis with transitions to a trichoderma, made up of 4–10 μm wide cylindric-hyphae with numerous free endings, resembling the cheilocystidia. Pigment mainly membranal, sometimes minutely encrusting in pileipellis and upper pileitrama. Pileitrama subregular, made up of 4–12 μm wide cylindrical hyphae. Clamp-connections numerous in all tissues.
Habitat & distribution.—In grassland and in deciduous forest in the coastal dunes on relatively calcareous, humus-rich sandy soil. Known to occur in several places, often in large groups, along the coast of the Netherlands.


The genus Leucopaxillus Boursier is relatively well-known due to the excellent monograph of Singer & Smith (1942) and the contributions by F. H. Moeller (1954) and Bon (1979). However, while working through the available Netherlands’ collections of the genus, a taxon was encountered which I was unable to name with the works mentioned above, nor with the keys of Kühner & Romagnesi (1953) and Moser (1983). The species concerned is well represented in the Rijksherbarium with several collections, all from the coastal dune-area. Macroscopically it shows some resemblance to Leucopaxillus paradoxus (= L. albissimus sensu Singer & Smith s.l., = L. cerealis (Lasch) Singer), but in general the collections are slightly darker on the pileus than mentioned for L. paradoxus in the descriptions of Boursier (1925), Kühner (1926), Singer & Smith (1942), Pegler (1975) and Malençon & Bertault (1975). But this difference is not so great that one could think of one the dark species like L. tricolor, L. gentianeus, or L. amarus. For that reason the Netherlands’ collections all were named L. paradoxus.

While examining the collections critically I found that all specimens studied had well differentiated cheilocystidia, usually so abundant, that the lamellar edge appeared to be entirely sterile. This is not mentioned in one of the descriptions cited above, and I started to doubt the correctness the identification of our L. paradoxus. Also the recent key to the genus Leucopaxillus of M. Bon (1979) did not help me out. Choosing for the pale coloured species, the only species with similar cheilocystidia is L. alboatutaceus (Moell.) Moell., but that differs among other things in having non-decurrent lamellae and much smaller spores (4–5(–6) × 3–4(–4.5) µm). Trying the other way by choosing for the darker species, I encountered a number of species with similar cheilocystidia, but with a considerably darker pileus than our fungus (L. gentianeus, L. mirabilis, and L. amarus). The only species with a more or less similarly coloured pileus seems to be L. tricolor, but this species has sulphur yellow lamellae which turn violaceous-chocolate-brown on drying (Michael-Hennig, 1979; Kühner & Romagnesi, 1953; and Singer & Smith, 1942).

Dr. M. Bon (St. Valéry-sur-Somme, France) who kindly checked my descriptions and exciccata of the Netherlands’ taxon, agrees that it does not fit into any of the known species of Leucopaxillus, with perhaps the exception of L. albissimus var. monticola Singer & Smith. That variety, which occurs under coniferous trees in the (sub-)alpine regions of the southern United States, differs slightly in having a paler, smoother pileus. Whether this variety is identical with our fungus or not, which is difficult to demonstrate without the type-collection, it seems to be untenable as a variety of L. albissimus as the occurrence of cheilocystidia is considered to be a major character on species level in
Leucopaxillus (cf. Singer & Smith, Moeller, Bon, i.e.). Therefore I consider my fungus as a species in its own right, and name it Leucopaxillus cutefractus because of the typical craqued-areolate pileal surface of mature, non-wheathered specimens.

ACKNOWLEDGEMENTS

I am very gratefull to Dr. C. Bas and Thomas W. Kuyper for critically reading the text of this paper and comments on nomenclatoral problems. The director of the Royal Botanic Gardens, Kew, England, is gratefully thanked for hospitality and the loan of type-specimens. Dr. A.v. Zaayen, Experimental Mushroom Growing Station, Horst, Netherlands, is cordially thanked for the gift of collections of Clitopilus fasciculatus and for providing the photograph. I am indebted to Henning Knudsen, Copenhagen, for his hospitality during my stay at the Botanical Museum in July 1983.

REFERENCES

CORRECTION

Persoonia Volume 12, page 161, legend of figure 6 should read:

Fig. 6. *Clitopilus daamsii*. — Habitat (×3) and spores (×2100). (All figs. from holotype).