



TRAVAUX MYCOLOGIQUES

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THE CLITOCYBE PYXIDATA GROUP

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Résumé. — Description de trois espèces nouvelles *Clitocybe scabriuscula*, *C. varispora*, *C. multicarpa*, qui forment avec *C. hepatica* (Fr.) Bigelow *nov. com.* et *C. pyxidata* (Fr.) Singer une nouvelle Section : *Clitocybe, Sectio Pyxidatae* (Fr.) Bigelow *nov. comb.*

In a previous revision of *Omphalina* (BIGELOW, 1970), a number of species were excluded which had been placed in this genus by other investigators. *Omphalina ss. meo* was characterized by yellow to orange colors in some portion of the basidiocarp, while the excluded species had other types of pigmentation. Of the latter, those species with reddish brown to vinaceous brown or tan colors in the pileus and stipe, pallid lamellae, and inamyloid spores, center about the well known *Clitocybe pyxidata* (Fr.) Singer (*Omphalina* aut. auct.).

This group is near *Clitocybe* section *Infundibuliformes* according to most characters, including pigmentation, of the basidiocarp. The *C. pyxidata* group and section *Infundibuliformes* do differ appreciably in size and texture of the pileus and stipe though, and by these characters one can recognize a hiatus. The magnitude of this hiatus and its taxonomic position of course are controversial, but in my opinion the relationships of the *Clitocybe pyxidata* group are expressed best when treated as a section of *Clitocybe*. Possibly *C. pyxidata* and related species represent a reduced series leading from section *Infundibuliformes* to *Mycena*. Certainly there appear to be similar pigments in the taxa of this sequence. The yellow to orange colors found in *Omphalina ss. meo* would seem to indicate a different origin for its species.

The colors in quotation marks which are cited in the descriptions are from RIDGWAY (1912).

Clitocybe sectio *Pyxidatae* (Fries) Bigelow, **nov. comb.**

Agaricus tribus *Omphalia* ** *Pyxidatae* Fries, *Epicrisis*, p. 122. 1836-1838.

Omphalia ** *Pyxidatae* (Fries) Saccardo, *Syll. Fung.* 5 : 312. 1887.

Omphalina b. *Pyxidatae* (Fries) Quélet, *Ench. Fung.* p. 43. 1886. (Type species of section : *Agaricus pyxidatus* Fries, *Syst. Myc.* 1 : 164. 1821.)

Pileus small, 5-20 (-35) mm broad, tan to cinnamon buff, vinaceous brown to reddish brown; context thin or very thin, fragile or brittle or pliant. Lamellae decurrent, pallid or tinged with vinaceous or tan (never gray to gray brown). Stipe slender, 1-2 (-4) mm thick, concolorous with pileus, fragile or brittle. Spores inamyloid, smooth. Pigment of pileus cutis encrusted. Clamp connections present. Cystidia absent. Terrestrial.

KEY TO SPECIES

1. Pileus dry, not striate 2
1. Pileus moist and hygrophanous, striate 3
2. Pileus fibrillose-scabrous to subgranulose; lamellae close to subdistant, narrow 1. *C. scabriuscula*.
2. Pileus smooth; lamellae very distant, moderately broad 2. *C. varispora*.
3. Basidiocarps gregarious or cespitose on conifer needles; stipes darkening from the base upward. 3. *C. multicarpa*.
3. Basidiocarps on moss or soil; stipes not darkening 4
4. Pileus pale tan to cinnamon color when moist; spores (5-) 6-7. 5 x (3-) 4-5 μ 4. *C. hepatica*.
4. Pileus shades of reddish brown to vinaceous brown when moist; spores (6-) 7-9 (-11) x 4-5 (-6) μ 5. *C. pyxidata*.

1. *Clitocybe scabriuscula* Bigelow, nov. sp.

Pileus 6-12 mm latus, plano-depressus demum subinfundibuliformis, margine arcuatus, siccus, opacus, fibrilloso-scabrellus, vinaceo-brunneus. Caro subtenaci. Lamellae decurrentes, angustae, confertae vel subdistantes, vinaceo-pallidae demum vinacea, atromarginatae. Stipes 2-2.5 cm longus, 1-1.5 mm crassus, glaber vel subpruinosis, cum pileus concolor. Sporae 6-9 x 4-5.5 μ .

Holotypus legit A.H. Smith, n. 62433, Waterloo, Michigan, 1 May 1960. (MICH).

Pileus 6-12 mm broad, plano-depressed, becoming shallowly vase-shaped with an arched margin, opaque, surface dry, minutely fibrillose-scabrous to subgranulose, vinaceous brown (near « fawn color »); context rather tough, very thin, pallid vinaceous. Odor none. Taste slightly fungoid.

Lamellae decurrent, narrow, close to subdistant, vinaceous pallid with the edges stained darker, some becoming vinaceous in age.

Stipe 2-2.5 cm long, 1-1.5 mm thick at apex, equal, surface faintly pruinose or glabrous, dingy vinaceous brown (about concolorous with pileus), base slightly white mycelioid.

Spores 6-9 x 4-5.5 μ , elliptic or sometimes elliptic-oblong, smooth, not amyloid. Basidia 27-37 x 6-7 μ , mostly 4-spored, a few 2-spored. Pileus cutis brown in KOH, pigment encrusted, hyphae cylindric or slightly inflated, 2.5-9 μ diam; context hyaline or tinged brownish, hyphae cylindric, 4-9 μ diam, encrusted or smooth and hyaline. Hymenophoral trama of undulate subparallel hyphae, hyaline or brownish, mostly cylindric, 4-8.5 μ diam, mostly smooth and hyaline but sometimes encrusted. Clamp connections present.

Gregarious. On moss. May.

Material examined : Michigan : Smith 62433 (type, MICH).

The colors found in the pileus and stipe of *Clitocybe scabriuscula* are not unlike those found in *C. hepatica* or some pale forms of *C. pyxidata*. Because of this similarity, it is quite possible that other specimens of *C. scabriuscula* have been overlooked or misidentified. However, the dry and opaque, roughened surface and marginate lamellae provide a distinctive combination of characters. *C. hepatica* also has somewhat smaller spores than those found in *C. scabriuscula*.

2. *Clitocybe varispora* Bigelow, nov sp.

Pileus 10-15 mm latus, planus, non striatus, siccus et impolitus, cinnamomeo-alutaceus. *Lamellae* decurrentes, valde distantes, sublatae, pallide. *Stipes* 12-20 mm longus, fere 1 mm crassus, glaber, dilutus cinnamomeo-alutaceus. *Sporae* 7.5-13.5 (-15) x 2.5-4.5 μ , pleomorphae.

Holotypus legit A.H. Smith, n. 69368, Upper Payette Lake, Valley Co., Idaho, 15 Aug 1964 (MICH).

Pileus 10-15 mm broad, plane, margin upturned in age, not striate, surface dry and unpolished, evenly cinnamon buff; context thin, concolorous with surface, gray with FeSO₄. No odor or taste.

Lamellae long decurrent, very distant, moderately broad, pallid.

Stipe 12-20 mm long, \pm 1 mm thick, equal, surface glabrous, pallid « cinnamon buff ».

Spores 7.5-13.5 (-15) x 2.5-4.5 μ , pleomorphic - elliptic to oblong or subcylindric or subfusoid in face view, at times inequilateral in side view, smooth, not amyloid. *Basidia* 24-37 x 5-7.5 μ , mostly 4-spored, sometimes 2-spored. *Pileus cutis* golden to brownish yellow in KOH, pigment encrusted, hyphae mostly cylindric, 1.5-9 μ diam, end cells protruding at

times ; context paler, hyphae cylindric, 2.5-7.5 μ diam, smooth or encrusted. Hymenophoral trama of undulate subparallel hyphae, cylindric to slightly inflated, 1.5-6 μ diam, smooth. Clamp connections present.

On ground. August.

Material examined : Idaho : Smith 69368 (type, MICH).

The spores of this agaric have the same variability in size and shape which was found to characterize *Clitocybe squamulosa* var. *montana* Bigelow. Curiously, both species have been found at the same collecting sites in Idaho, and one cannot help but speculate on the possible effects of some undetermined environmental factor on spore production.

From other species in section *Pyxidatae*, *C. varispora* is distinctive by the spore characters in conjunction with the dry, opaque pileus and very distant lamellae.

3. *Clitocybe multicarpa* Bigelow, nov. sp.

Fig 1.

Pileus 5-15 (-20) mm *latus*, *convexus* *mox depressus*, *leviter striatus* *tum plano-depressus*, *infundibuliformis* *in vetustas* *et margine interdum-laceratus*, *sericeo-furfuraceus*, *glabrescens praeter discus squamulosus*, *atrovinaceo-brunneus demum avellaneus vel pallidior*. *Lamellae* *decurrentes*, *distantes*, *angustae vel latae*, *aquoso-cinereae vel sordide et cinereo-vinaceae*, *interdum submarginatae*. *Stipes* 10-30 (-50) mm *longus*, 1-1.5 (-3) mm *crassus*, *aequalis vel interdum deorsum attenuatus*, *subpruinosis vel sericeus*, *glabrescens cum pileus concolor vel apice pallide*, *basis fuscans*. *Sporae* (6-) 7-8.5 (-9) \times 3-4 μ .

Holotypus legit A.H. Smith, n. 58506, Boulder Lake, McCall, Idaho, 3 July 1958 (MICH).

Pileus 5-15 (-20) mm broad, convex at first with the disc soon depressed, margin incurved and faintly striate, expanding to plano-depressed, and finally infundibuliform, margin ragged or frayed at times in age, surface with innate silky-furfuraceous coating at first, glabrescent except disc appearing minutely squamulose when faded, moist and hygrophanous, dark wood brown to vinaceous brown moist (« warm sepia », « verona brown », « wood brown »), somewhat paler in age, fading to pale avellaneous or near « vinaceous buff » ; context thin or very thin, fragile, concolorous with pileus surface or pallid. Odor and taste mild.

Lamellae decurrent to long decurrent, distant, narrow near pileus margin to broad near the stipe, often arched, forked at times, watery grayish

to dingy grayish vinaceous (« tilleul buff », « avellaneous »), faintly margined at times.

Stipe 10-30 (-50) mm long, 1-1.5 (-3) mm thick at apex, equal or sometimes tapered downward, faintly pruinose or silky at first, glabrescent, fragile or pliant, concolorous with pileus or apex pallid, darkening from the base upward (vinaceous brown to dark brown or blackish).

Spores (6-) 7-8.5 (-9) x 3-4 μ , elliptic to elliptic-oblong, smooth, not amyloid, white in deposit. Basidia 22-36.5 x 6.5-8 μ , 4-spored. Pileus cutis brownish to orangish in KOH, pigment encrusted, hyphae mostly cylindric, 1.5-6 (-10) μ diam; context hyaline, hyphae cylindric to inflated, (3-) 8.5-17.5 μ diam, walls slightly thickened at times. Hymenophoral trama of subparallel hyphae, cylindric to inflated, 3.5-16 μ diam. Scattered oleiferous hyphae present. Clamp connections present.



Fig. 1. — *Clitocybe multicarpa* Bigelow, nov. sp.
X 1 photo by A.-H. SMITH.

Scattered, gregarious. or cespitose. On conifer needles (spruce, hemlock). July and August.

Material examined : Idaho : Bigelow 1782, 1788 (MICH); Smith 15759, 58506 (type), 59771, 65884 (MICH); Washington: Smith 29321, 29698, 30220, 30569 (MICH).

The other species of section *Pyxidatae* are found in moss or on soil, so the luxuriant growth of *C. multicarpa* on conifer needles would seem to be worthy of emphasis as a taxonomic character. The darkening of the stipes to finally blackish is also unusual and is a diagnostic character.

4. *Clitocybe hepatica* (Fries) Bigelow, nov. comb.

Agaricus pyxidatus * *A. hepaticus* Fries, *Epicrisis*, p. 122. 1836-1838.

Agaricus (Omphalia) hepaticus (Fr.) Berk. *Brit. Fung.* p. 131. 1860.

Omphalia hepatica (Fries) Gillet, *Les Hyménomycètes*, p. 294. 1874.

Omphalina hepatica (Fries) Orton, *Trans. Brit. Mycol. Soc.* 43 : 180. 1960.

Pileus 8-15 mm broad, deeply infundibuliform, margin striate, nearly to disc at times, surface glabrous or disc slightly roughened at times, moist and hygrophanous, pale tan to nearly cinnamon moist, fading to buff and opaque; context thin, concolorous with pileus surface. Odor and taste not distinctive.

Lamellae long decurrent, narrow, close to nearly subdistant, intervenose at times, whitish or tinged with tan.

Stipe 2-4 cm long, 1-2 mm thick at apex, equal, surface glabrous, fragile, watery appearing, tan.

Spores (5-) 6-7.5 (-8) x (3-) 4-5 μ , elliptic, smooth, not amyloid. Basidia 24-30 x 4-7.5 μ , 4-spored. Pileus brownish in KOH, pigment finely encrusted, cutis hyphae cylindric, 2-6.5 (-10) μ diam; context hyphae cylindric or somewhat inflated, 4.5-12 μ diam. Hymenophoral trama of interwoven to somewhat undulate-subparallel hyphae, cylindric, 3-9 μ diam, encrusted at times. Clamp connections present.

Gregarious. On moss in spring area near road, on burned area, on soil in short grass. September and October.

Material examined : U.S.A. : Michigan : Smith 33-959, 50816 (MICH); Norway: Nyborg: Bigelow 16425 (coll. by A. Pilat) (MASS).

In the literature, there have been several interpretations of this species, and frequently it has been confused with *Clitocybe pyxidata*. ORTON (1960) has noted that *C. hepatica* (as *Omphalina*) is separated by the smaller spores and paler colors. He also emphasized a pubescent stipe and a hoary coating

to the pileus. The Michigan and Norway specimens agreed with ORTON'S description in regard to colors and spore characters, but differed by having glabrous stipes and pilei. Whether or not these specimens represent another taxon or merely a variation of *C. hepatica* is uncertain at present.

5. *Clitocybe pyxidata* (Fries) Singer

Ann. Myc. 41 : 45. 1943.

Agaricus pyxidatus Fries, Syst. Myc. 1 : 164. 1821.

Omphalia pyxidata (Fries) Kummer, Führer in die Pilzkunde, p. 107. 1871.

Omphalina pyxidata (Fries) Quélet, Ench. Fung. p. 43. 1886.

Omphalina subhepatica (Batsch) Murrill, N. Amer. Fl. 9 : 346. 1916.

Pileus 10-35 mm broad, at first convex with the disc depressed and the margin incurved, expanding to broadly infundibuliform but often remaining with a spreading margin, striate moist, disc deeply depressed, surface glabrous, moist and hygrophanous, dark reddish brown to dark vinaceous brown at first (« chestnut », « russet », « warm sepia », « chocolate », « burnt umber »), paler with expansion (« sayal brown », « snuff brown », « verona brown », « clay color »), but the striations remaining dark and prominent, fading with age or loss of moisture to buff or grayish vinaceous (« pinkish buff », « cinnamon buff », « avellaneous »), finally opaque; context thin, whitish, pliant or fragile. Odor and taste not distinctive.

Lamellae long decurrent, close to subdistant, rarely distant, narrow or mid portion to moderately broad, forked at times, not intervenose, pallid to pale vinaceous gray (near « vinaceous buff », « avellaneous »), sometimes tinged cinnamon in age.

Stipe 10-35 mm long, apex 1-4 mm thick, equal or nearly so, stuffed soon hollow, rather brittle, compressed at times, surface faintly pruinose at first but soon naked and polished, concolorous with pileus or apex somewhat paler (« walnut brown », « mikado brown », « cinnamon »), base with slight white mycelium.

Spores (6-) 7-9 (-11) × 4-5 (-6) μ, elliptic to broadly elliptic or ovate, smooth, not amyloid, white in deposit. Basidia 21-31 × 5-8 μ, mostly 4-spored but sometimes 2-spored. Pileus cutis brown in KOH, pigment encrusted and in slightly thickened and smooth walls, hyphae mostly cylindrical, 2-6 (-8.5) μ diam; context pale brown, hyphae mostly cylindrical, 1.5-8.5 μ diam, encrusted or smooth. Hymenophoral trama of interwoven to undulate-subparallel hyphae, yellowish to brownish, cylindrical, 1.5-6 μ

diam, encrusted or smooth. Refractive hyphae present. Clamp connections present.

Scattered or gregarious. Usually on moss in the open, sometimes on wet sand or gravel. July through October.

Material examined (representative collections) : U.S.A. : Colorado : Smith 52002 (MICH); Idaho : Smith 53599 (MICH); Michigan : Bigelow 2708 (MICH); Oregon : Kauffman, Siskiyou National Forest (MICH); Wahington : Smith 30816 (MICH). Canada : Quebec : Bigelow 5415 (MASS); Yukon Territory : DAOM 55721 (DAOM); District of Keewatin, Northwest Territories : Savile 1077 (DAOM). Sweden : Smaland : Haglund 761 (MICH). Switzerland : Canton de Haud : Favre (MICH).

Clitocybe pyxidata is the most common and widely distributed species of the section. It is know from a number of sites in north temperate and subarctic regions, and also occurs more southerly in subalpine to alpine habitats.

Many investigators have noted the variability of field characters, and sometimes spore size, in *C. pyxidata*. Several varieties have been described, but these are often difficult to evaluate in view of the variations observed in large collections of var. *pyxidata*. *C. pyxidata* var. *rivulicola* Favre appears to be distinct by its dark lamellae and broad spores (6.5-7.5 μ). *Omphalia muralis* (Fr.) Quélet is considered by some mycologists to be a synonym of *C. pyxidata* var. *pyxidata*.

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