



TRAVAUX MYCOLOGIQUES

dédiés à

R. KÜHNER

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NOTES ON GALERINA

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Résumé. — L'auteur décrit quelques espèces de *Galerina* insuffisamment délimitées, ou non encore signalées hors de la localité type. Il s'agit des *G. brunneimarginata*, *oinodes*, *alpestris* (espèce nouvelle), *nybergii*, *subpectinata*, *annulata*, *mainzii*, *pallida*.

Thanks to the early work by R. KÜHNER, the delimitation of the genus *Galerina* has been established and its most important European species been described (1935). After the monograph by SMITH & SINGER (1964) several of the species originally thought to occur only in the Western hemisphere have been observed in Europe. It was again KÜHNER (1966) who found and redescribed one of these species (*G. pseudocerina*) from Europe. It is the purpose of the present paper to indicate the occurrence of some species of *Galerina* in regions thus far believed to be outside their area of distribution. This makes it possible also to give revised descriptions of the species involved, or descriptions of new taxa where this turns out to be necessary.

Galerina brunneimarginata (Murr.) Smith & Sing. (Fig. 1)

This species was somewhat tentatively accepted as being different from *G. laevis* (Pers.) Sing. (*G. graminea* (Velen.) Kühn.) by us (1964). It differs indeed, and I believe constantly, from *G. laevis* by the absence of dermatocystidia on the pileus. The species without dermatocystidia has now been rediscovered in Europe and in Mexico. A redescription of *G. brunneimarginata* from fresh material will make it easier to compare it with *G. laevis*. Neither size nor color of the carpophores are essentially different in these two species.

Pileus watery light brownish ochraceous in the central portion, very pale ochraceous brown between the striae which in fresh condition are transparent and run up to three quarters of the radius towards the center but surface smooth and, when faded estriate, young caps often hyaline with some light ochraceous arelas, older ones often tending to turn deeper brown

in the marginal zone or to sordid-brown color on the striations, hygrophalous, paler and more sordid or merely paler in faded condition, glabrous, naked, campanulate to conical, sometimes acutely papillate, sometimes obtuse, rarely more repand in age and then reaching more than 20 mm, otherwise 7-17 mm broad; margin straight but tending to become incurved when drying.

Lamellae ochraceous or ochraceous buff, then gold-brown-ochraceous, ascendant, mostly rather narrow, close to subdistant, adnate to adnexed; edge even and concolorous.

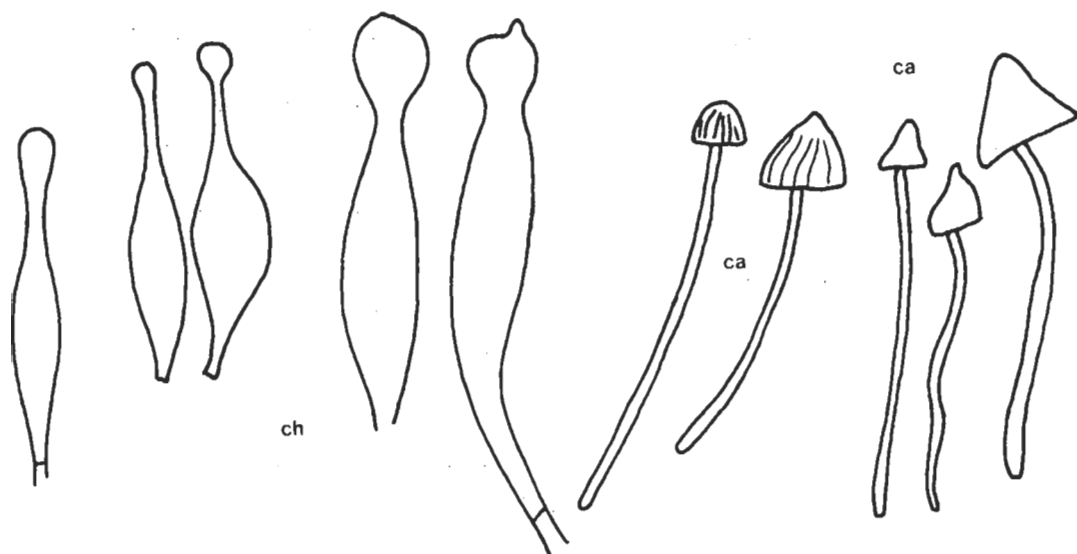


Fig. 1. *Galerina brunneimarginata* : ch = cheilocystidia $\times 1000$, ca = carpophores $\times 1$.

Stipe pallid or ochraceous-whitish, towards the base eventually very pale brownish, not viscid, innately pallid-silky but glabrescent, only the apex finely pruinose-pubescent from dermatocystidia even in mature specimens, without a trace of a veil, equal, subequal, or slightly tapering upwards, sometimes flexuous, 40-60 $\times$ 1-3.5 mm.

Context very pale ocher to very pale brownish, in base of stipe eventually light ochraceous brownish; odor none; taste mild.

Spores 7.5-9 $\times$ 4.4-5.7 μ , ellipsoid to ovoid, light rusty ochraceous brown (KOH), ochraceous (NH₄OH), inamyloid, varying from almost smooth to distinctly but minutely punctate-verruculose, the ornamentation not

strongly contrasting in color from the basic spore wall (NH₄OH), some with, more without suprahilar depression or applanation, without a plage, without a germ pore. — Hymenium : Basidia 21.5-28.5 x 5.2-6.3 μ , all or nearly all 4-spored; cystidia none (rarely a cheilocystidium somewhat away from gill edge); cheilocystidia numerous and making the edge of the lamellae heteromorphous, 17-45 x 4.5-10 μ , ventricose in the middle or below the middle, constricted above the middle with a globose or subglobose capitulum, more rarely ampullaceous with or rarely without a subcapitate tip, neck or constriction 1.5-3 μ across, capitulum 3-5 μ diam. — Hyphae without gelatinization, without conspicuous pigment incrustation and without clamp connections. — Cortical layers : Dermatocystidia on the margin of the pileus sometimes present but rare and very scattered, on the rest of the pileus hyphal ends not cystidiform, epicutis a cutis without dermatocystidia, hypodermium also cutis-like, neither gelatinized nor with conspicuous pigment-incrustations, yellow. Dermatocystidia numerous at the apex of the stipe, forming the pruina, 30-90 x 7-25 μ , mostly about 9-10 μ broad, in shape like the cheilocystidia but often larger, capitulum 5-11 μ in diameter, hyaline.

On fallen leaves of conifers, often among mosses or grasses in montane Abietetum (*religiosae*), in small groups, fruiting in summer. Mexico : along the road from San Pedro de Nexapa to Paso de Cortés near the Barranca de Ameyalco, between 3 000 and 3 200 m alt. Singer M 1 566 (MICH) and M 4 860 (F).

I am now convinced that *G. dimorphocystis* var. *nexapensis* Sing. in SMITH & SING, is a synonym of *G. brunneimarginata*. The dermatocystidia on the pileus of fresh specimens vary from very scarce at the margin of the pileus only to completely absent whereas in both *G. laevis* and *G. dimorphocystis* they are numerous all over the pileus. The absence of pigment incrustations in the hypodermium is also a useful character in the distinction of *G. brunneimarginata*.

***Galerina oinodes* (Berk & Curt.) Sing.**

(Fig. 2)

The type of *Agaricus oinodes* Berk. & Curt. (FH) does not now show the wine color or reddish tinge indicated by BERKELEY and CURTIS, but may well have had it when they were fresh or freshly dried. The size and shape of the carpophores as they appear in the herbarium is much like that of *G. evelata* (Sing.) Smith & Sing. The microscopical characters of the type are the following : Spores 8.5-10.8 x 5.5-6 μ , calyptrate with the perisporeal

wall loosening to form ear-like bulges in many spores, ellipsoid to amygdaliform, with a coarse verruculose ornamentation, with plage, without a germ pore but with a strong callus. Basidia $24.7 \times 7.8-8.5 \mu$, 4-spored; cystidia none; cheilocystidia $37-60 \times 9-14.5 \mu$, ventricose below, ampullaceous, with a cylindric or capitate apex, always with rounded-obtuse tip, or with a small mucro, mucro or neck $5.5-7 \mu$ across, capitulum, if present, 8 u in diameter. Hyphae with clamp connections. Epicutis without, apex of stipe with dermatocystidia similar to cheilocystidia.

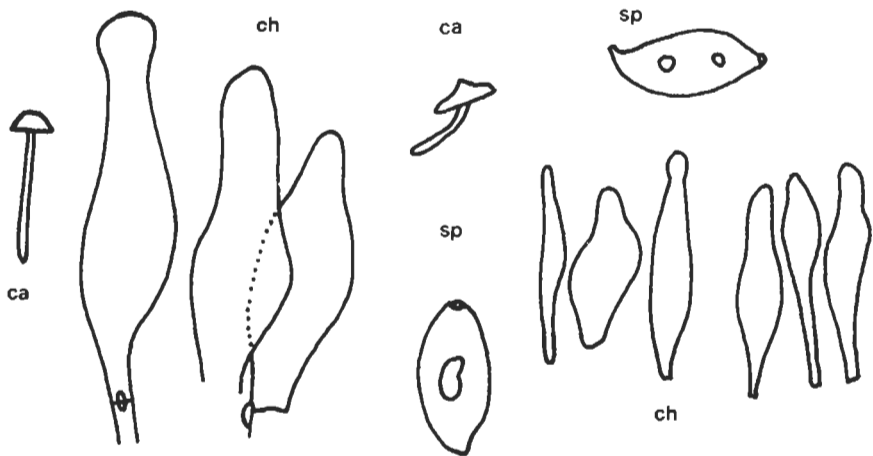


Fig. 2. *Galerina oinodes* (left) and *G. nybergii* (right); ca = carpophore $\times 1$, ch = cheilocystidia $\times 1000$; sp = spores of *G. nybergii*, $\times 2000$.

This species differs from other species of section *Calyptrospora* which are lignicolous in having different microscopical characters and from all species in its color. It is perhaps closest to the *G. cerina* complex and *G. antarctica* and represents, as far as known, the first and only species of its section discovered in Cuba.

Galerina alpestris Sing.

(Fig. 3)

Galerina alpestris Sing. nov. sp. — Pileo ochraceo-brunneo, siccando plerumque bicolori, obtuso; lamellis sudistantibus vel distantibus; stipite dermatocystidiis frequenter capitatis pruinosulo-pubescentulo ut minime

ad apicem, exannulato; odore nullo. — Sporis $8.3-11 \times 5-6 \mu$, subtiliter verruculosus sed haud marmoratis tantum, ornamentatione colore episporii fundamentalis obscuriore, nec calyptratis nec poro praeditis; basidiis tetrasporis; cystidiis nullis; cheilocystidiis et ampullaceis et capitatis praesentibus nec non paucis vesiculoso-ventricosis; hyphis fibulatis, in hypodermio pigmento incrustatis, epicute haud gelatinosa dermatocystidiis destituta; ad terram in alpinis praeter glacies inter Brya aestate fructificans in Helvetia. Typus a R. Singer (C 5494) lectus et in F conservatus.

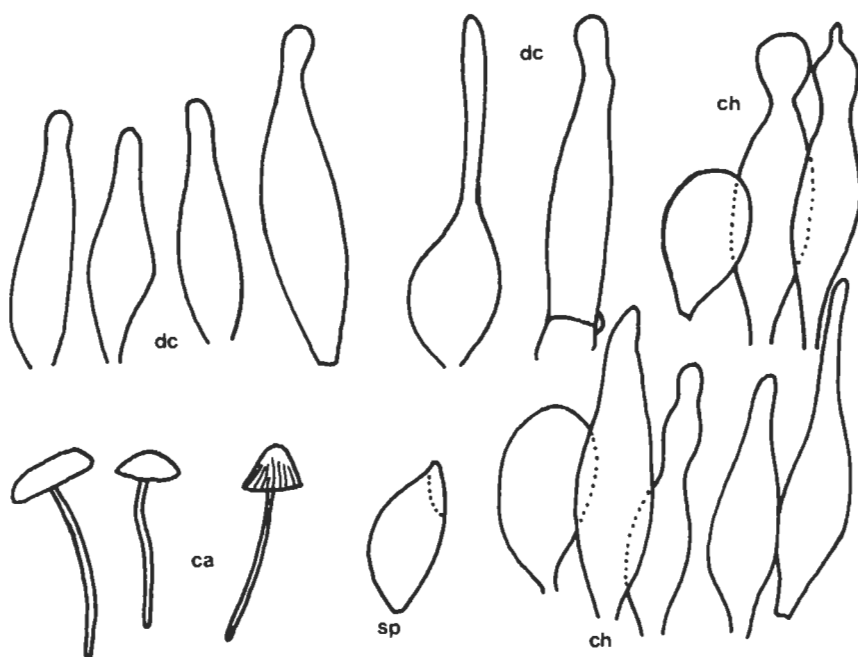


Fig. 3. *Galerina alpestris*; dc = dermatocystidia $\times 1000$; ca = carpophores $\times 1$, sp = spore $\times 2000$, ch = cheilocystidia $\times 1000$.

Pileus ochraceous-tawny-brown (between « kis kilim » and « burnt umber »), hygrophanous, fading either evenly or bicolourously (center darker) to a much paler color (« polar bear », « toast » or 14-G/E-9, Maerz & Paul, 1st ed.), but fresh-faded most frequently maintaining a contrastingly brown disc region, transparently striate over two thirds of the radius when moist and usually also somewhat sulcate, not viscid, glabrous and naked, obtusely

campanulate, then campanulate-convex or campanulate-subhemisphaeric, 8-14 mm broad.

Lamellae ochraceous-tawny then rusty-brown, ventricose, broad, subdistant to distant, adnate.

Stipe concolorous to lighter ochraceous brown at the base and gradually much paler even pallid at the apex, the latter pruinose, further downwards varying from minutely pruinose by (under a lens) small and very scattered hairs, but naked when mature, equal, 22-25 x 0.7-1.3 mm.

Context subconcolorous with the surfaces; odor none; taste not distinctive.

Spores 8.3-11 x 5-6 μ , occasionally some giant spores up to 11.3 x 6.2 μ present, with a finely verruculose ornamentation contrasting (deeper) with the ground color, ovate to subamygdaliform-ellipsoid, with distinct plage, without germ pore but with a distinct callus, not calyptrate. — Hymenium: Basidia 19-29 x 6.2-8.5 μ , 4-spored. Cystidia none; cheilocystidia numerous, 24-55 x 5.8-10.2 μ , ampullaceous, broadest just below the middle, more rarely with a capitulate, subcapitulate or claviculate apex above a constriction (2.7-4.8 μ across), the non-capitulate apex sometimes with slight constrictions, mostly about (2.7)-4.5 μ wide, all thin-walled, hyaline but mostly with a brownish ochraceous to golden melleous lower portion, more rarely entirely pigmented; among these usually a few ventricose-subvesiculose cheilocystidia 15-20 x 6.5-12.5 μ present. — Hyphae with clamp connections, not gelatinized anywhere, hymenophoral trama regular, with broad inflated hyphae in the middle portion, brownish or melleous with a fine pigment incrustation. — Covering layers: Epicutis of the pileus either well developed and formed of filamentous hyaline hyphae which form a cutis, not gelatinized, or else epicutis poorly developed and often exposing the hypodermium; dermatocystidia none; hypodermium also a cutis consisting of filamentous or inflated hyphae which are heavily brown incrustated by the pigment; dermatocystidia none. Covering of the stipe consisting of dermatocystidia which are very numerous at the apex, scarcer in the lower portion of the stipe, generally like the cheilocystidia but much more frequently subcapitate or capitate than these, and the subvesiculose-ventricose type more strongly represented, in both cases reaching 12.5-(20.5) μ in width.

In the lower alpine zone, often in the zone below the glacier or near the glacier-lake, among mosses (*Bryum*) on the ground, singly or gregariously. SWITZERLAND: Valais: Glacier Lake below Glacier de Moiry, 2355-2380 m alt. August. 14, 1971, Singer C 5501, C 5502, C 5503. — Along the river Borgne du Ferpècle, at 1958 m alt., 11-VII-1971. Singer C 5454. Both at F.

Galerina alpestris belongs to the *G. hypnorum* complex and it is quite possible, even probable, that the majority of the indications of *G. hypnorum* in the higher altitudes of the Alps and Caucasus actually refer to this new species. A similar, also alpine, species occurs in the Andes, and a further species from the Alps and higher altitudes of the United States (Montana) — *G. mainsii* Smith & Singer, redescribed below — is often superficially similar.

The European collections of *G. hypnorum* are not bicolorous when fading, have lower, marbled ornamentation on the otherwise similar spores and somewhat differently shaped cheilocystidia which are hyaline. The descriptions of North American material of *G. hypnorum* indicate slightly different cheilocystidia and little differentiated, scarcely incrustated hypodermium and may be better classified as *G. subhypnorum* (Atk.)

The Andine species, *G. hypsizyga* Sing. in SMITH & SING. has likewise much less pigment-incrusted hypodermium and more consistently capitate cheilocystidia; the spores are broader than in *G. alpestris*.

G. mainsii Smith & Sing. differs in the presence of pleurocystidia, but these may be rather scarce in some individual carpophores or sections, and the two species, *G. mainsii* and *G. alpestris*, are at times macroscopically so similar that they can easily be confused in the field.

G. alpestris is also related to *G. obscurata* Smith in SMITH & SING. which differs in being umbonate, reaching larger spore measurements, and having hyaline cheilocystidia; perhaps, the pileus is also darker when fresh (« Mars brown » Ridgway). It comes from the wooded regions of the North American continent. Its other characters fit *G. alpestris* so well that at first I thought these species to be conspecific inasmuch as a collection from Finland (SMITH & SINGER l. c. p. 173) was cited for *G. obscurata*; but I suspect now that the Finnish material rather belongs to *G. alpestris*.

***Galerina nybergii* A. H. Smith in Smith & Sing.**

(Fig. 2)

This species was described from Finland. It occurs however also in the subalpine zone of the Alps and is here redescribed on the basis of the Alpine material.

Pileus ochraceous with ochraceous-brownish or brown-ochraceous disc region and stramineous-ochraceous marginal region, slightly hygrophanous, slightly fading by dehydration, dried 10-G-6 on margin and « cigarette » (Maerz & Paul, 1st ed.) in the center, not viscid, glabrous, naked, smooth, convex, subumbonate, about 10 mm broad.

Lamellae melleous-ochraceous with ocher-white edges, broad, ventricose, subclose to subdistant, adnate.

Stipe ochraceous brown all over when fresh, pruinose at the apex, subglabrous to glabrous below, equal, often-curved; veil none seen, annulus absent; 10-13 x 1.2-1.5 mm.; basal mycelium pallid, scanty.

Context concolorous but slightly paler than surfaces, fragile; odor none.

Spores 9.5-11.7 x 4.3-5.5 μ , oblong-fusoid or subfusoid, quite smooth, without a plage-line even in phase contrast and chloralhydrate medium, with a small, sometimes truncate germ pore, with distinct endo- and epispodium, the entire wall 0.5-0.7 μ thick, ochraceous brown in KOH, with suprahilar appplanation but without depression, not pseudoamyloid. — Hymenium: Basidia 18-25.5 x 8-9.7 μ , 4-spored. Cystidia none; cheilocystidia numerous, making the edge heteromorphous, but rather small and often easily collapsing, very variable, 18.5-32 - (45) x 4-9 μ , filamentous to ventricose-ampullaceous with short to medium long neck (2-4 μ diam.), some especially those near the margin of the pileus, capitate (capitulum 4-4.5 μ diam.), and then the constriction underneath 1.7-(3.5) μ across, all hyaline or hyaline with ochraceous base, thin-walled. — Hyphae of the pileus-trama paler than those of the hypodermium, some swollen, not gelatinized, with clamp connections; hymenophoral trama regular, consisting of filamentous and inflated hyphae (more filamentous in the hymenopodium), pale ochraceous to subhyaline, non-gelatinous. — Covering layers: Epicutis of the pileus — a non-gelatinous cutis, a thin layer, consisting of hyaline, filamentous hyphae 2.5-4 μ broad, some with a fine pigment-incrustation; dermatocystidia at the apex of the stipe present, variable.

On wet earth among scattered mosses, solitary, Italy: Savoya, Val Ferret, Prâ Sec, at. 1630 m alt. R. Singer C 5381 (F), 8 VI 1971.

This species is a good example of section *Porospora* and should be compared with *Kuehneromyces* which is certainly not congeneric and has usually relatively broader spores with broader germ pore.

***Galerina subpectinata* (Murr.) Smith & Sing.**

(Fig. 4)

This species, originally described from Cuba, has been re-collected in Mexico. Since only the type (dried) had been studied before, a complete description of the Mexican collections is added:

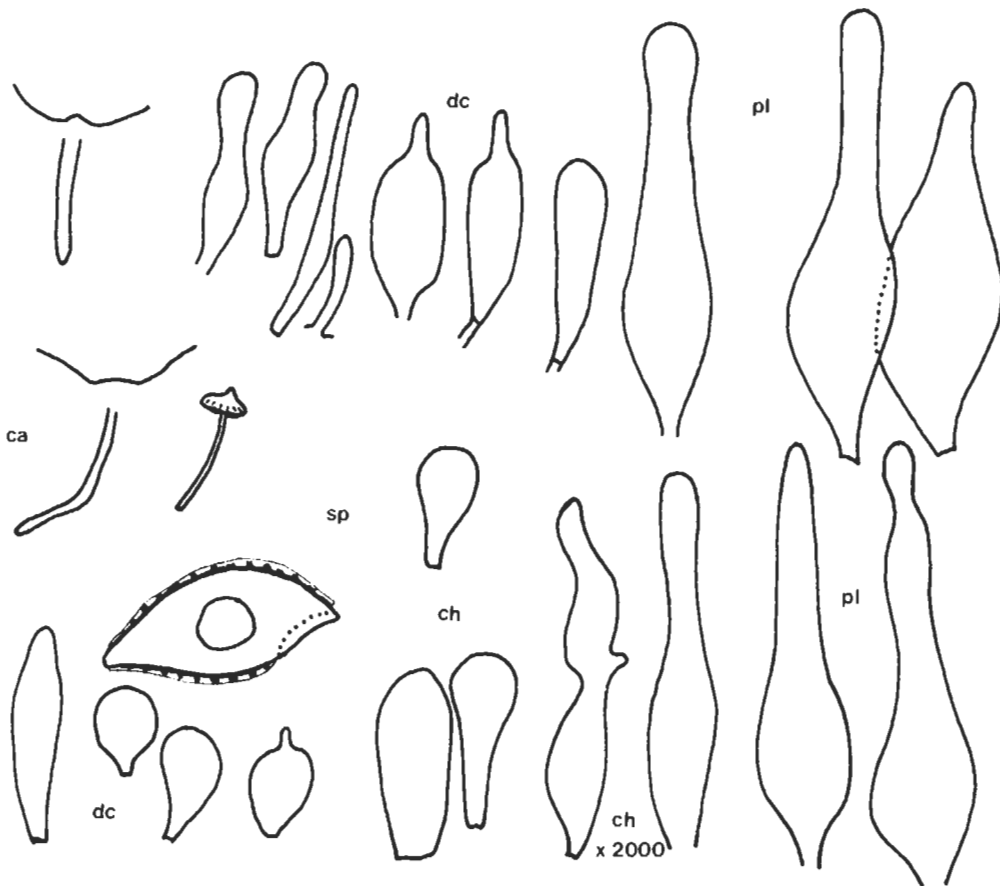


Fig. 4. *Galerina subpectinata*; ca = carpophores $\times 1$, sp = spore $\times 4\,000$; dc = dermatocystidia $\times 1\,000$, ch $\times 2\,000$ = cheilocystidia $\times 2\,000$; ch = cheilocystidia $\times 1\,000$, pl = pleurocystidia $\times 1\,000$.

Pileus ochraceous brown or tawny brown, hygrophanous,, fading rapidly to white or whitish ocher but the papilla often remaining ochraceous brownish when faded, appearing pruinose when freshly faded but glabrescent, under a lens minutely pubescent in places when quite fresh, not viscid, naked, campanulate-convex, but later often strongly concave, papillate or subpapillate, 6-31 mm broad, margin first incurved, soon sulcate.

Lamellae light to rather deep rusty ochraceous brown, narrow to broad, subdistant, adnexed to decurrent, mostly adnate.

Stipe whitish to pale ochraceous, soon becoming ochraceous brown, but fading somewhat, smooth to innately fibrillose-costate, even in places somewhat reticulate, suglabrous to densely pubescent but glabrescent, exanulate, hollow, central or eccentric, 18-25 x 0.3-2 mm; basal mycelium white.

Context yellowish white to ochraceous whitish in the pileus, pallid to brownish in the stipe; odor none.

Spores 7-8 x 4-5.2 μ (perisporium included in measurements), pip-shaped to amygdaliform, without a germ pore but with a strong callus and sometimes somewhat mucronate at the distal end, with suprahilar depression or applanation, with deep colored, punctate-warty to short-costate or heavily verrucose ornamentation, with a rather deep colored epi- and an ochraceous endosporium, the spore enveloped by a pale brownish perisporium which is sometimes rather loosely attached but not calyptrate. — Hymenium : Basidia 15-22 x 5-7.7 μ , all 4-spored or some few 2-spored ones present. Cystidia on both edges and sides of the lamellae, varying from numerous to rather scattered, 35-62 x 10-15.8 μ , ampullaceous, with thin or rather thin wall (0.3-0.5 μ), the neck either attenuated to a rounded tip or equal or with a subapical constriction or $\pm$ claviculate above, hyaline, sometimes yellowish, apex 4.3-7 μ across, sometimes slightly hyalin or yellowish incrusted. Cheilocystidia of two types (and both at times rather scattered or early collapsing), (a) like the pleurocystidia or smaller with frequently broadened tip (reaching at times the same diameter as the lower ventricose portion), neck or constriction about 2.5-2.7 μ across, 19-24 x 3.5-6 μ , hyaline, some with short lateral branches or broad, obtuse diverticula, (b) like those of *G. bullulifera* and mainly near the margin of the pileus, clavate to clavate-subvesiculose, 12-25 x 6-10 μ , hyaline to pale brownish. — Hyphae of the pileus-trama hyaline to yellowish, often with rather thick and in alkali swelling wall and/or very minutely yellowish or hyaline incrusted, with clamp connections, not anywhere imbedded in a gelatinous mass. Hymenophoral trama regular, of the same structure. —

Covering layers: Epicutis of the pileus — a cutis and not gelatinized, with occasional dermatocystidia which may also be replaced by unmodified filamentous hyphal ends, but dermatocystidia always present, $10-35 \times 2-7 \mu$, versiform, subfilamentous to ventricose, clavate or ampullaceous to mucronate, more rarely like the cheilocystidia of type (b) and then $9-29 \times 5.5-9 \mu$, all thin-walled or more rarely slightly thickish walled, hyaline to pale golden melleous, erect or ascendant; stipe with similar dermatocystidia, rising from the vertical subparallel hyphae of the surface of the stipe where they are moderately thick-walled (1μ) in mature specimens. Hypodermium of pileus of broad ($4-11 \mu$) hyphae with thickish walls, few slightly incrustated.

On decaying dead wood of dicotyledonous trees in tropical rain forest vegetation, singly to cespitose, fruiting in June and July. Mexico: Veracruz: Estación Biológica de las Tuxtlas, 7 km from Montepio, Singer M 8094 and 8715, 12-VI-1969 and 28-VII-1969, (both F).

This description shows that neither the width of the lamellae nor the general measurements of the carpophores provide a constant character useful for the distinction of *G. subpectinata* from *G. hepaticicola*; neither is the relative abundance of pleurocystidia a useful indication as to whether one species or the other is at hand. Nevertheless, it appears that the habitat on wood, the sulcate margin, and the characteristics of the tramal hyphae separate this species from *G. hepaticicola*. In the coniferous woods of the mountains of Central Mexico we find a related species, always on coniferous wood or on woody debris, differing by less strongly ornamented and larger spores and bisporous basidia. This has been described by SMITH & SINGER (l. c. p. 280) as *G. cedretorum* var. *bispora* Smith & Sing. (Singer M 1578 and M 8512).

***Galerina annulata* (Favre) Sing.**

(Fig. 5)

This species, as described by FAVRE (1955) and re-collected by SINGER had been identified with *G. subannulata* (Sing.) Smith & Sing., but comparison with the type of *G. subannulata* shows that these are different if similar and related species of section *Galerina*.

Pileus rather deep reddish brown (« leafmold » or « kis kilim » Maerz & Paul, 1st ed.) macroscopically glabrous, hygrophane, much paler when faded, reaching beige-pallid, transparently striate over one third or one half of the radius when moist, campanulate, obtuse or more rarely somewhat

papillate, 6-8-(13) mm broad: margin first almost straight later sulcate, often appendiculate with a stramineous-pallid veil.

Lamellae ocher then dull rusty brown, ascendant, broad, distant, adnexed to adnate.

Stipe brown (e. gr. « burnt umber » M & P), with at least initially paler (« sweetmeat ») apex, macroscopically glabrous and eventually somewhat shining, in the upper quarter to half finely pruinose when seen under a lens both above and below the attachment of the fugacious veil, equal, hollow, sometimes flexuous, $20-38 \times 1-1.5-(2)$ mm; veil stramineous-pallid, sometimes annuliform but always present even if only consisting of some fibrillose flocons, but later disappearing.

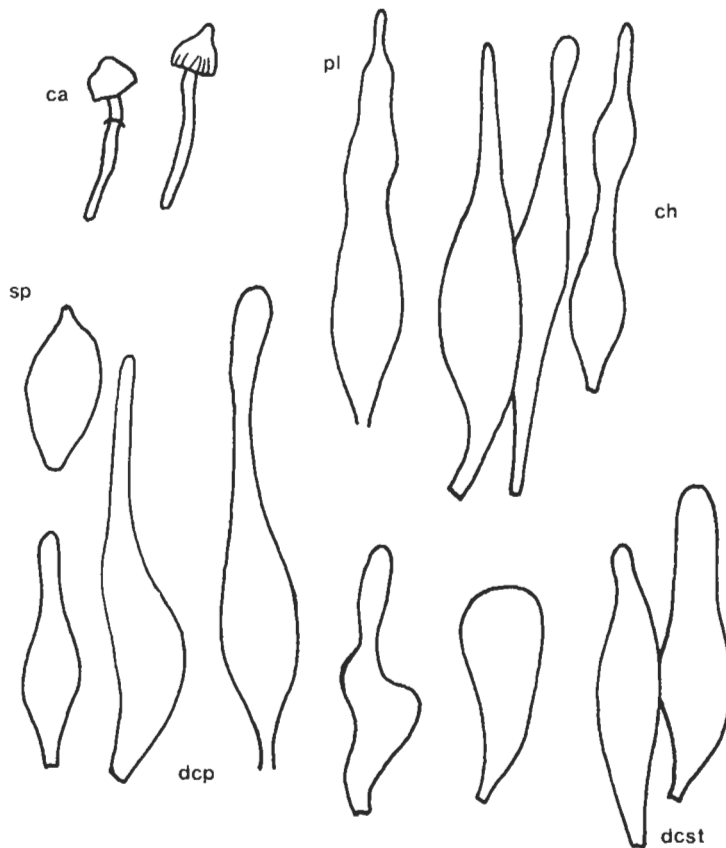


Fig. 5. *Galerina annulata*; ca = carpophores $\times 1$, sp = spore $\times 2\,000$, dcp = dermatocystidia (five) of the pileus $\times 1\,000$, pl = pleurocystidium $\times 1\,000$, ch = cheilocystidia (three) $\times 1\,000$; dcst = dermatocystidia (two) of the stipe $\times 1\,000$.

Context concolorous with the surfaces ; odor none ; taste slightly raphanaceous.

Spores $9.7-12.3 \times (3.7)-4.8-7.2 \mu$ ellipsoid to mucronate ellipsoid, or amygdaliform, smooth to (more often) somewhat rugulose in outline, punctate to verruculose ornamented by a moderately contrasting (darker) ornamentation, this deep brown on pale straw-yellow ground in KOH, with distinct plage and callus, — Hymenium : Basidia $21.5-42 \times 8.5-10.5 \mu$, (2-3-) 4-spored. Cystidia $36-73 \times 6.5-11.7 \mu$, ampullaceous with long apex (which is sometimes slightly claviculate above or by steps attenuated towards the thin but obtuse tip, not capitate, entirely hyaline or sometimes with brownish base, thin-walled ; cheilocystidia similar, not making the edges fully heteromorphous, sometimes constricted between two swellings and often with narrower apex. — Hyphae not gelatinized, with clamp connections. — Covering layers : Epicutis of the pileus not gelatinous, a cutis from which numerous, more rarely scattered dermatocystidia arise, these like the cheilocystidia but often crooked, often fascicular and crowded together, often brown-incrusted with pigment granules, some vesiculose without apical neck, $22-73 \times 5.5-19 \mu$. Stipe in its upper portion covered with numerous ampullaceous dermatocystidia $36-55 \times 7.5-14 \mu$, often also present in the lower third of the stipe but there very scattered. Hypodermium of the pileus and rind-layer of the stipe consisting of subparallel hyphae with strong chestnut-ferruginous pigment incrustations.

Among mosses in moist places, gregarious, more rarely solitary, above 1950 m alt. Switzerland : Valais : Borgne de Ferpècle, 11 VII 1971, Singer C 5444, C. 5458, C 5461 (F.).

This species differs from *G. subannulata* with which it shares the dermatocystidia and the veil characters, in being not exclusively (1)-2-(3)-spored, having fewer vesiculose cheilocystidia and cystidia than ampullaceous ones (if any), more distant lamellae and growing in moist conditions (near springy areas) among mosses rather than in relatively dry conditions among *Empetrum*.

***Galerina mainsii* Smith & Sing. var. *tetraspora* Sing.**

(Fig. 6)

Var. tetraspora Sing. nov. var. a *var. mainsii* differt basidiis tetrasporis. *Typus* a R. Singer (C 5471) et in *F. conservatus*.

Pileus rather deep brown (between « broncho » and « bracken », Maerz & Paul, 1st ed.) or slightly deeper when moist, strongly hygrophanous, fading to « champagne » or almost whitish in the center or in a broad zone between

the center and the margin, being strongly bicolorous in most specimens while fading, the margin maintaining in many cases a brownish fuscous (near « English oak ») shade when drying, not viscid and transparently striate and sulcate over at least one third of the radius, but opaque when faded, glabrous, in older caps sometimes with a minute scurfiness at the rim of the margin (not from the veil !) but naked, sometimes with crenulate margin, conic-convex or campanulate to semiglobate, later convex and very obtuse or even with depressed center in age, 8-19 mm broad

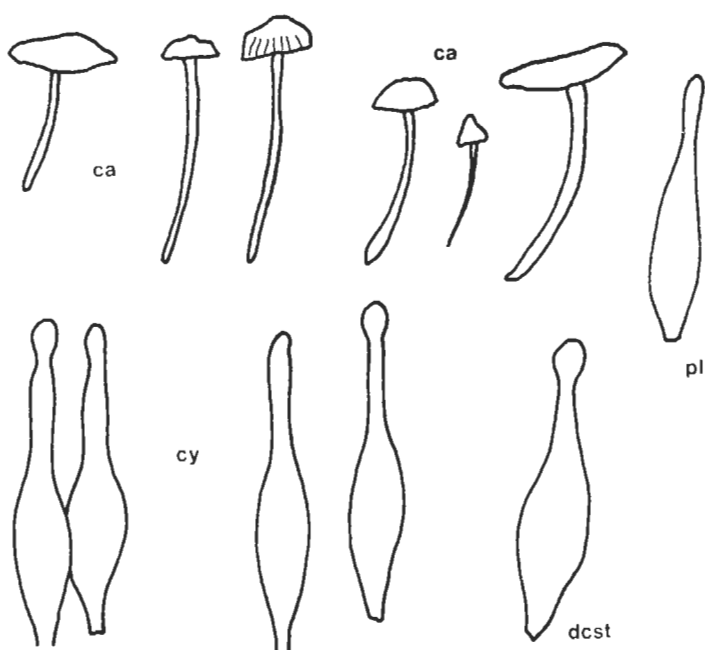


Fig. 6. *Galerina mainsii* var. *tetraspora*; ca = carpophores $\times 1$, cy = cystidia from the edge region $\times 1\,000$, pl. = cystidia from sides of lamella $\times 1\,000$, dcst = dermatocystidium from the stipe $\times 1\,000$.

Lamellae rusty ochraceous brown when mature, broad, sometimes very broad, mostly ventricose, distant, adnate or adnexed, sometimes rounded-adnate.

Stipe rather evenly brownish to brown, sometimes somewhat paler above or concolorous with the non-faded pileus in the lower portion, glabrous to minutely pruinose at the apex, under a lens pruinose-pubescent (the

pubescence scattered in the lower two thirds and there often becoming indistinct), occasionally with some very fugacious, inconspicuous pallid silky veil-rests but always quite naked when mature, always exannulate, subequal or equal, more rarely slightly tapering downwards, tubular, $18-30 \times (0,5)-1-2$ mm; basal mycelium white.

Context very thin except in the central portion of the pileus, somewhat paler than the surfaces; odor none.

Spores $8.3-10.3-(13.5) \times 4.8-6.2-(6.5) \mu$ (measurements of occasional giant spores in parentheses), varying from pip shaped to ovate-amygdaliform, more rarely ovate-ellipsoid (the giant spores more oblong), with suprahilar appanation, with a distinct plage, with an ornamentation varying from finely punctate to verrucose, contrasting in KOH, but the plage area not always absolutely smooth, the circumference varying from smooth to finely verrucose-rough (ornamentation not projecting more than unp to 0.3μ), the perisporium indistinct and not loosening, pseudoamyloid, without a germ pore but with a distinct callus and often mucronate at the distal end. — Hymenium : Basidia $(14)-21-28 \times 7-9.7 \mu$, all 4-spored, or few bisporous ones intermixed. Cystidia and cheilocystidia scarcely differentiated, the former often scarce but always present, $21-50 \times 6.3-10.3 \mu$, ampullaceous, apex attenuated or equal, rarely subcapitate (capitulum if present $1.7-4.4 \mu$ diam.) otherwise above $1.3-3 \mu$ broad, $10-20 \mu$ long, with hyaline or in lower portion or entirely brownish, thin to slightly thickened ($0.3-1 \mu$) wall, the wall thickening not constant and restricted to the median portion; edge not completely heteromorphous; near margin of pileus often cystidioid bodies present (which cause the scurfiness of some pilei at the rim), these $21-42 \times 6-12.3 \mu$, light ochraceous brownish, ventricose to subvesiculose, thin-walled, often as end-cells of hyphal chains, often numerous. — Hyphae of the pileus and stipe with clamp connections, inamyloid, not gelatinized, occasionally with a slight pigment-incrustation, those of the stipe subparallel and almost pallid in the rind of the stipe; hymenophoral trama regular, subhyaline, soon brownish ochraceous and occasionally with a slight pigment incrustation. — Covering layers : Epicutis of the pileus, in form of a cutis, very slightly or almost not at all gelatinized, variable in depth and at times very shallow; dermatocystidia on pileus none, hypodermium consisting of a cutis of non-gelatinized, often strongly inflated and generally rather broad hyphae which are distinctly if finely pigment incrustated in mature specimens. Dermatocystidia of the stipe numerous in the apical region, occasionally also found in the lower two thirds of the stipe, much like the cheilocystidia, but more frequently more broadly ventricose below or shorter, more often capitate or subcapitate.

Among mosses on the ground above the tree line and up to the glacier, often in small groups. Switzerland : Valais : Along the river Borgne de Ferpècle to the glacier du Mont Miné, 11-VII-1971 to 19-VII-1971, Singer C 5443 and C 5471 (F, typus).

This agrees with *G. mainsii* in all important characters but the 2-spored basidia but Smith (in SMITH & SINGER, l. c. p 309) reports also a 4-spored form from Colorado which appears to be identical with our var. *tetraspora*. This species can easily be confused with *G. alpestris* (which has no pleurocystidia) and *G. annulata* (which has a distinct veil) whereas *G. mainsii* is characterized by the presence of pleurocystidia and the absence of an appreciable veil rest on the pileus and stipe. *G. mainsii* comes very close to the stirps *Vittaeformis*, particularly *G. vittaeformis* var. *albescens*. *G. vittaeformis* is also rather common in the alpine zone of the Alps but lacks the bicolorous appearance of the pileus when fading and the dermatocystidia of the stipe are numerous even in the lower two thirds of the stipe ; also the pleurocystidia of the hymenium are more numerous.

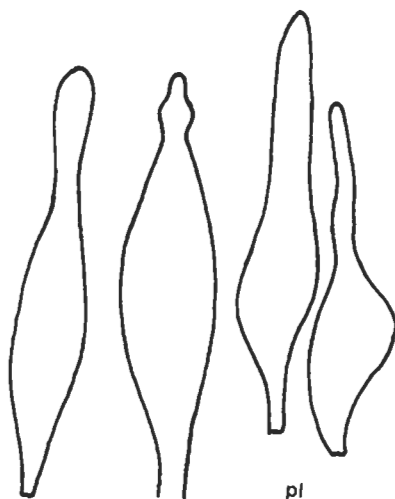


Fig. 7. *Galerina pallida* ; pl = pleurocystidia $\times 1\,000$.

Galerina pallida (Pilát) Horák & Moser in Moser
(Fig. 7)

A revision of the type (PR) shows that this is indeed a *Galerina* of section *Pseudotubaria*.

Spores $7.7 \times 4.5-5 \mu$ (some up to $10 \times 5\mu$), smooth, with up to 0.9μ thick stramineous, pseudoamyloid wall, with yellowish oil drop(s), ellipsoid, without plage, with callus but without a germ pore. Hymenium : Basidia $14-25 \times 5-7.5 \mu$, 2-3-4-spored, basidioles rather short and broad. Cystidia present on edges and sides of the lamellae, crowded or numerous on the edge, hyaline, firm- but not thick-walled, $31-58 \times 4-12 \mu$, few longer or broader, ampullaceous with $2.5-5 \mu$ wide neck which is equal or tapering upwards, rarely claviculate, generally obtuse. — Hyphae with clamp connections; hymenophoral trama strictly regular, stramineous-subhyaline. — Covering layers : Epicutis of pileus — a slightly gelatinized to very weakly gelatinized cutis of filamentous hyaline hyphae; hypodermium brownish-subhyaline without a distinct pigment incrustation, with somewhat broader hyphae; dermatocystidia visible only at the apex of the stipe, like the hymenial cystidia.

This analysis shows that HORAK & MOSER in MOSER (1967) were correct in transferring this species (originally described as *Velomycena*) to *Galerina*. However, pleurocystidia are present and the spores have no germ pore. The type collection contains a few foreign spores which have a germ pore.

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