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Corrections

Page 225, line 20: change 'Cruenta' to 'Cruentata'.
Page 229, lines 21, 26: change '*pinicola*' to '*taxicola*'.
Page 347, line 6: change '*fulva*' to '*monacha*'.

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THIS THE SECOND VOLUME OF PERSOONIA
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BY HIS GRATEFUL ASSOCIATES AND PUPILS

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TYPE STUDIES ON BASIDIOMYCETES. X[1]

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(With 35 Text-figures)

For the first time a systematic study of the types and authentic specimens of agarics and boletes preserved in the Persoon Herbarium has been carried out. Some aspects of the possibilities of type analysis with regard to specimens over 130 year old are discussed. 137 species were analyzed. The following new combinations are proposed: *Mycena amygdalina* (Pers.) Sing., *Psilocybe angulata* (Batsch ex Pers.) Sing., *Inocybe argillacea* (Pers. ex Pers.) Sing., *Lepiota aspera* var. *acutesquamosa* (Weinm.) Sing., *Pseudoclitocybe bacillaris* (Pers.) Sing., *Acurtis chalybeus* (Pers. ex Fr.) Sing., *Hemimycena cucullata* (Pers. ex Fr.) Sing., *Tubaria dispersa* (Pers.) Sing., *Omphalia grossula* (Pers.) Sing., *Campanella merulina* (Pers.) Sing., *Mycena phyllogena* (Pers.) Sing., *Galerina laevis* (Pers.) Sing., *Galerina pumila* (Pers. ex Fr.) Sing., *Resupinatus trichotis* (Pers.) Sing. A new name, *Collybia kuehneriana* Sing., is proposed.

1. THE AGARICALES IN THE PERSOON HERBARIUM

The Persoon Herbarium, preserved at the Rijksherbarium in Leiden (L), is one of the oldest fungus collections existing and certainly the most important classical herbarium of European species. The Agaricales material preserved is far from being complete as far as the species published by Persoon are concerned, particularly those published before "Mycologia europaea". Therefore it does perhaps not have all the importance in comparison with Fries's Herbarium we should expect with regard to the typification of pre-Friesian names. Nevertheless, the number of traceable species is considerable.

With the new methods of anatomical analysis of preserved material now at our disposal, and taking advantage of a long experience with the European fungus flora, it has been possible to come to a positive conclusion regarding a rather large number of type specimens and authentic material seen and determined by Persoon. This author had been preoccupied with the possibilities of application of modern taxonomical methods in the case of material as old as this (many specimens older than a century and a half!) and with the possible upset any definite determinations may cause in the list of generally known and accepted interpretations of common European species. Both fears have proved to be needless.

The material although for many years kept in precarious conditions of preservation

[1] Previous contributions under this title were published, (I) *in* Mycologia **34**: 64–93. 1942; (II) **35**: 142–163. 1943; (III) **39**: 171–189. 1947; (IV) *in* Lilloa **23**: 147–246. 1950, publ. 1952; (V) *in* Sydowia **5**: 445–475. 1951; (VI) *in* Lilloa **26**: 57–159. 1953; (VII) *in* Sydowia **6**: 344–351. 1952; (VIII) **9**: 367–431. 1955; (IX) **13**: 235–238. 1959.

has not been destroyed to the point of becoming worthless at least in the great majority of cases. On the contrary, many specimens are still in excellent shape. The anatomical characters except for poor preservation of fugacious structures like the epicutis of some Mycenas and the cystidia with thin collapsing walls are still very well demonstrable if sections are made with the necessary care and in the medium and with the colorants best fitted for each individual case. The pigments are likewise often remarkably well preserved, but one has to be careful not to misinterpret some necrotic pigments appearing as dark hyphal incrustations in material even much less old than Persoon's.

It has been of particular interest to be able to prove that the amyloid reaction of the spore walls as well as the pseudoamyloid reaction of the hyphal walls is well visible in even the oldest specimens and in spite of poor conservation during times past. This, however, is not the case as far as the pseudoamyloid reaction of the spores is concerned. Under ordinary conditions, this reaction may become weak or nil in a majority of the spores after long preservation of the material, and will invariably end up, after more than 140 years, in a completely inamyloid reaction. This was carefully checked on material of *Paxillus panuoides* (Fr. ex Fr.) Fr. Naturally, under certain conditions this loss of reactivity may be accelerated as has been observed in material kept in the tropics.

Another inconvenience is the change that can be observed in the (resinous?) material of the exosporial ornamentation of the Cortinariaceae. We have observed that especially in *Cortinarius* and *Rozites* the warts of material preserved more than 100 years is apt to undergo changes which lead to a diminution of the ornamentation which thus may easily be overlooked in specimens of the Persoon Herbarium if such a deterioration is unexpected. A similar diminution of incrusting pigment may be observed (but will not necessarily take place) on some hyphal walls of certain agarics. And finally, one will have to proceed extremely carefully in order to obtain complete revival of the spores shrunk or collapsed without destroying them too much to observe their original shape and size. It is often necessary to look for well preserved spores a much longer time than would ordinarily be the case in material of recent preparation.

A comparison of the current names applied to European Agaricales with the list of those that have to be changed because of the results of the present type studies will show that such name changes will be on a very moderate scale.

The Persoon Herbarium is at present very well taken care of. The material studied by me has generally been annotated so that a checkup on any data provided below will easily be possible without sectioning more material than necessary. The fragments or carpophores in a condition to be successfully analyzed are in some cases extremely scarce and it is recommanded that future investigators section only the minutest portions of the remaining material and that only in cases where it is unavoidable. This same policy has been followed by the author of the present type studies.

It is a pleasant duty to thank the authorities of the Rijksherbarium and the

mycologists in charge of the collections for permission to study this extraordinarily valuable material and help in every way at their disposal to bring this work to a successful end. I am particularly indebted to Dr. H. J. Lam, Director of the Rijksherbarium who, on the initiative of Dr. M. A. Donk, has invited me to undertake these as well as other Agaricales-studies in the Mycology Department of their institution. The author has had the pleasure not only of disposing of the necessary space and equipment, modern herbarium facilities and literature, but of the advantage of discussing his problems with the mycologists of the staff, Dr. M. A. Donk, Dr. R. A. Maas Geesteranus, Mr. C. Bas and Mr. J. van Brummelen.

The type studies are ordered alphabetically under the names used by Persoon as well as the authors who contributed the respective specimen to the Persoon Herbarium. This will permit easy orientation. In a second list, we give the species mentioned under their modern names and in systematic order.

AGARICUS

AGARICUS ACUTUS Pers., Syn. 316. 1801 *ex* Fr., Syst. mycol. **1**: 233. 1821.

The type is marked "*Agaricus acutus* Pers. Syn. Fung." (L 910.249-1191). This is a typical representative of the small species of *Cortinarius* of the hygrophanous subgenus, without any sort of belt or veil visible now. The pileus is now deep brown and glabrous; lamellae rather narrow and close; stipe now pale dirty fuscous. Spores ellipsoid, rarely somewhat amygdaliform, light rusty brown or rusty ochraceous, with verrucose exosporium, the latter not deeper colored than the episporium, with a slight suprahilar depression or applanation, with or without a slight callus, without plage, 7.5–8.2(–9.2) × 4.5–5.2 μ; warts distinctly projecting, and ornamentation stronger in distal region of spore than below (as in most species of *Thaxterogaster!*). Cheilocystidia, appearing filamentous, not well preserved, hyaline. Clamp connections seen. — Illustration: Fig. 1.

These data show that the material analyzed is not significantly different from current modern interpretations, e.g. Kühner & Romagnesi, of what is now called *Cortinarius acutus* (Pers. ex Fr.) Fr.

There is additional material, one doubtfully determined "Confer *Ag. acutus*", the other (L 910.249–1209) apparently being a mixed collection, the specimen at the right possibly the same as the type, the rest not agreeing with the type and the original description because of the presence of a white belt on the stipe and broader and less close lamellae but also because of broader (5.7–6 μ) spores.

AGARICUS ADSTRINGENS Pers., Syn. 350. 1801 *ex* Fr., Syst. mycol. **1**. 195. 1821.

Pileus now fuscous bister, center darker spadiceous fuscous, apparently not umbonate, dried 14–26 mm broad (fresh over 25 mm broad); lamellae medium broad, about 3 mm broad, almost crowded to close, sinuate or subdecurrent to decurrent; stipe concolorous with pileus now, cylindric but with somewhat bulbously widened base, 50–75 mm long and 1.5–5 mm broad, apparently glabrous. Said

to have "substyptic taste" and to grow in the woods. The spores are rough, amyloid and amylaceous-warty, 6.5–8 × 4.6–8.5 μ; basidia clavate, 4-spored, 18–23 × 5.8–7.5 μ. Cystidia distinctly ampullaceous with cylindric to subcapitate neck 23–35 × 5.3–7 μ with the apex muricate by colorless crystals. This is the type, L 910.250–1502. — Illustration: Fig. 2.

This is quite obviously a species of *Melanoleuca* as had been anticipated by many authors, including the writer of these lines. However, it does not key out readily in the available keys. The ornamentation of the spores corresponds to the type IV, V or VI. The color of the spore print is not known but it is presumably pure white ("lamellis candidis"). It is to be hoped that this apparently uncommon species will be rediscovered in Germany or France. It has been interpreted as a variety of *M. melaleuca* but it differs considerably from that species as well as from Konrad's interpretation of *A. adstringens*.

This species, if admitted as specifically different from *M. melaleuca* should be known as *Melanoleuca adstringens* (Pers. ex Pers.) Métrod.

AGARICUS ALBOVIOLACEUS Pers., Syn. 286. 1801 *ex* Fr. Syst. mycol. **1**: 218. 1821.

The specimen marked "*Ag. alboviolaceus* P." collected near Paris (L 910. 256–1785) is at least authentic and must be considered as basis for the understanding of the species even if it cannot be proved that it is the holotype since there is no date of collecting. According to Fries, "optima species".

Spores 8–10 × 4–5.8 μ, ellipsoid to subamygdaloid, rusty-melleous, with slightly deeper fine verruculose ornamentation but not now very rough. The stipe is now rather pallid and naked and the pileus now subumbonate. In three of four specimens the base is thickened, almost subbulbous. — Illustration: Fig. 3.

The descriptive data taken together with the spore measurements and the habitat (leaves of broad-leaved trees attached to one specimen) confirm the correctness of the traditional interpretation of this species in the sense of Fries, Kühner & Romagnesi, Moser, etc. [as *Cortinarius alboviolaceus* (Pers. ex Fr.) Fr.].

Agaricus alliatus Schaeff.—See *Agaricus schaefferi* Pers.

AGARICUS ALUTACEUS Pers., Syn. 441. 1801 *ex* Fr., Syst. mycol. **1**: 55. 1821 (form a).

The only specimen determined by Persoon and preserved here is L 910.256–1737. It was collected by Junghuhn in Germany but recognized by Persoon since it was

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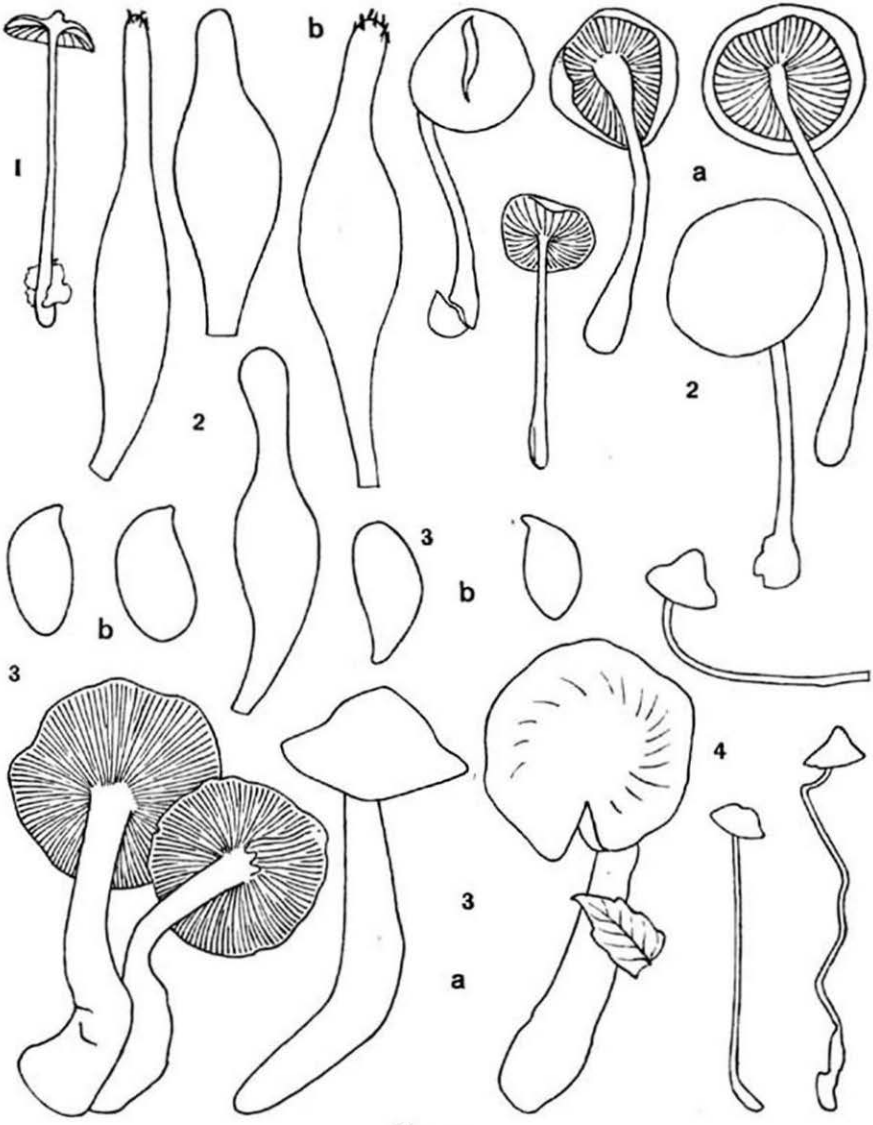
EXPLANATION OF FIGURES 1–4

All figures depicting the carpophore show it in natural size as preserved, except where indicated otherwise. Spores are drawn enlarged (× 2000), hyphae are enlarged to 1000 ×, cystidial elements and basidia are likewise enlarged × 1000.

Figs. 1–4. — 1. *Agaricus acutus* Pers. ex Fr. Carpophore. — 2. *Agaricus adstringens* Pers. ex Fr. a. Carpophores. b. Cystidia. — 3. *Agaricus alboviolaceus* Pers. ex Fr. a. Carpophores. b. Spores. — 4. *Agaricus amygdalinus* Pers. Carpophores.



Figs. 1–4

inserted in his herbarium without question mark or re-determination. Nevertheless, it cannot be proposed as a lectotype since it cannot have been broader than 4 cm across with a stipe about 30 × 7–9 mm which is in contradiction with Persoon's and Fries' statement that it is "magnus" respectively "major" and "rubro" inasmuch as the color of the pileus as preserved is deep purple (with pallid areas).

The anatomical characters of this species are well preserved, and the dried material also gives a good idea of its macroscopical features. All data obtained by a careful examination make this unquestionably *Russula punctata* Krombholz, the species which some authors still call *Russula turci* Bres. although the type of the latter is a mixed collection not containing this element. It is the common European species with the mycelium and often parts of the fruiting body smelling of iodoform.

AGARICUS AMARELLA Pers., Mycol. eur. **3**: 99. 1828.

The type of this species (L 910.250–1498) is well preserved. The specimen at the extreme right was sectioned.

Spores uneven-verruculose, hyaline, inamyloid, 6–7 × 5–6.5 μ. Basidia 20–22 × 4.5–5.7 μ. Cystidia none. Hymenophoral trama regular, hyaline, of thin hyphae. Hyphae of stipe filamentous, 2–2.5 μ thick, without clamp connections.

The analysis shows that this is the same species as *Rhodocybe popinalis* (Fr.) Sing. in the interpretation of all modern authors. It becomes a synonym of the latter.

See also *Agaricus commistus* Pers.

AGARICUS AMBIGUUS Lév. *non* Pers.

The material of this species as preserved in the Persoon Herbarium represents a population of primordia of agarics which cannot be determined. L 910.250–1496.

AGARICUS AMYGDALINUS Pers., Mycol. eur. **3**: 255. 1828.

The type of this species (L 910.250–1495) bears direct reference to Mycol. eur. no. 438 and is in good condition. — Illustration: Fig. 4.

Spores 7–8.5 × 5–5.8 μ, smooth, hyaline, ellipsoid, broadly ellipsoid, or oblong, thin-walled, amyloid. Basidia 15 × 5.5 μ, few seen with sterigmata but those were two-spored. Hymenophoral trama regular, consisting of broad voluminous cells, still pseudoamyloid. Cheilocystidia not recovered.

This is undoubtedly what Kühner and A. H. Smith call *M. iodiolens* Lundell. The combination **Mycena amygdalina** (Pers.) Sing., *comb. nov.*, is therefore proposed and *M. iodiolens* falls into synonymy. The almond odor indicated by Persoon was evidently his expression of describing the odor characteristic for this species.

AGARICUS ANGULATUS Batsch *ex* Pers., Mycol. eur. **3**: 155. 1828.

The specimen (L 910.250–490) is the post-Friesian type of this species since it agrees recognizably with Persoon's own figure (l.c., pl. 36 fig. 3–4). It is in good condition.

Spores 7–8 × 5.2–5.8 μ when seen frontally, in profile about 4 μ broad, lentiform,

oval in frontal view, elliptic and narrower in profile, smooth, now melleous in NH_4OH, thick and complex-walled, with a broad and applanate germ pore. Basidia 16–22 × 5.7–7 μ, 4-spored. Cheilocystidia not found. Pleurocystidia none seen. Epicutis of repent elongate hyphae, clamp connections present. It grows on dead monocotyledonous material.

Since this is said to be dry, it is without doubt one of those poorly known forms near *Psilocybe inquilina* mentioned by Kühner & Romagnesi (Flore anal. 339. 1953) under letter "K". Consequently, we propose the combination **Psilocybe angulata** (Batsch ex Pers.) Sing., *comb. nov.*

It is necessary to add that the misinterpretation by Fries (Hym. Eur. 473 as *Marasmius angulatus*) refers to a species of *Marasmiellus* which has nothing whatsoever to do with Persoon's concept and is demonstrably erroneous.

AGARICUS ANISATUS Pers., Obs. mycol. **1**: 44. 1796 *ex* Pers., Mycol. eur. **3**: 108. 1828.

There are three authentic specimens of this species (variety of *A. odorus* in Pers., Syn. 323). A careful analysis shows that they are all identical with what is now correctly called *Clitocybe odora* (Sow. ex Fr.) Kummer.

AGARICUS ARCHYROPUS Pers., Mycol. eur. **3**: 135. 1828.

The type of this species, collected at Versailles on oak leaves, is in good condition: L 910.256–812. It corresponds exactly to the illustration (l.c., pl. 25 fig. 4).

The pileus is now smooth and glabrous, rather large, almost flat, with incurved margin, color light buff; lamellae crowded, free, narrow; stipe elongated, covered with the kind of covering familiar in *Collybia confluens* all over to the extreme apex which is enlarged.

Spores 6.3–7.3 × 1.8–3.5 μ, hyaline, inamyloid, smooth; basidia 18 × 3.8 μ; cystidia none; cheilocystidia typically septate, some with irregular outgrowths, elongate, hyaline. Hyphae of the trama of the pileus including those of the cuticular layer radially arranged, extreme outer layer of epicutis somewhat deteriorated from molds, all hyphae inamyloid, with clamp connections.

The analysis shows that this is obviously a plain synonym of *Collybia confluens* (Pers. ex Fr.) Kummer. It is indeed difficult to see by what characters Persoon differentiated between the two species, both well known to him. All speculations regarding the identity of *A. archyropus* with rarer forms of *Collybia* and *Marasmius* are therefore useless.

Bulliard pl. 585 is doubtfully cited for *A. archyropus* Pers. by Persoon himself (1828); this means that by that time he had given up the name he applied to Bulliard pl. 585 fig. 2, viz. *Agaricus sagarum* Pers. which he had not seen himself until 1801. In the time between 1801 and 1828, however, he knew material of *A. sagarum* (see under that name).

AGARICUS ARENATUS Pers., Syn. 293. 1801 *ex* Fr., Epicr. 283. 1838.

The specimen L 910. 250–1485 is not the type but authentic material. Persoon's label contains the equation:

Agaricus psammocephalus Bull.
——— *arenatus* Pers.
——— *pholideus* Fr.

This may mean that the equation was added later, and that the material is not the holotype. Even so, it gives us a good understanding of what Persoon had in mind when describing *A. arenatus* as an interpretation of Bulliard's plate of *A. psammocephalus*. The material conserved in the Persoon Herbarium cannot be the type since his description of 1801 makes it quite clear that at that time he had not collected the species or received material.

The spores of this collection are ellipsoid, rather thickwalled, hyaline or subhyaline, smooth, 9.5–11.5 × 6.3–7 μ. We are obviously dealing with an agaricaceous species, probably a *Leucoagaricus*, certainly not with a cortinariaceous species and not with a *Dermocybe*.

While it is obvious that Persoon's original type of *A. arenatus* is Bulliard, Herb. pl. 586 fig. 1—whatever that is—, it is equally obvious that Fries when revalidating Persoon's species in *Cortinarius* changed the type to be represented by the description of some *Cortinarius* subgenus *Dermocybe* near *C. pholideus* (Fr.) Fr.—a species he himself had observed.

Persoon's authentic specimen has nomenclatorial and historical importance only for those who wish to interpret the rules in a manner that would permit to use the pre-Friesian type, i.e. as Bulliard pl. 586 fig. 1 (or if that were insufficient for identification, and not exclusive of the *Lepiota*-like specimen, the specimen analysed above) whereas the author interprets the rules so as to believe that the type of *A. arenatus* (Pers. ex) Fr. is the description in "Epicrisis".

AGARICUS ARGILLACEUS Pers., Obs. 1: 51. 1796 *ex* Pers. Mycol. eur. **3**: 121. 1828.

The type is L 910.250–1470 which is in good condition. Since it contains insufficient data, it may also be merely authentic material, but it coincides well with the description and the figure in Icon. pictae pl. 14 fig. 2, and must be taken as basis for the understanding of this species. — Illustration: Fig. 5.

Spores 7.5–10.5 × 4.5–5.7 μ, amygdaloid, few more ellipsoid or even reniform, smooth, brownish; metuloids e.g. 70 × 15.5 μ, hyaline, large, thick-walled, fusoid-ventricose, muricate.

This is what is known as the white 'variety' of *Inocybe geophylla* (Sow. ex Fr.) Kummer. Obviously, Persoon (1828) considered the lilac form as the type of what he had named *A. geophilus*, and Fries (1821) quotes Sowerby under form b. which is the lilac variety. Since Sowerby describes in the original diagnosis both the white and the colored form, Fries has taken the lilac one as lectotype (implicite). For those who consider the white 'variety' as specifically different from the lilac type, Persoon's species comes in handy. The new combination in *Inocybe* is here proposed:
Inocybe argillacea (Pers. ex Pers.) Sing., *comb. nov.*

AGARICUS ARIDUS Pers., Mycol. eur. **3**: 193. 1828.

The type is L 910.250–1484 and the syntype L 910.250–1469.

Both specimens are easily recognizable, according to all their macro- and microscopical characters, as *Phaeomarasmius erinaceus* (Fr.) Sing. According to the new Code of Nomenclature the Friesian name as published in "Elenchus" (p. 33) has preference.

AGARICUS ASPER Pers., Syn. 256. 1801 (*et ant.*, as *Amanita*) *ex* Fr., Syst. mycol. **1**: 18. 1821.

What appears to be the type (L 910.250–1467) is labeled *Agaricus asper* Pers. It is in good condition.

The pileus has the typical surface of the section *Echinatae* of *Lepiota*, and has a diameter of nearly 90 mm. The spores are 7.5 × 3 μ, and still slightly pseudoamyloid!

This shows that we are dealing here not with an *Amanita*, as Fries (1838), and with him the majority of recent authors believed but with the form Kühner & Romagnesi designate as *Lepiota acutesquamosa* var. *furcata* Kühner. This, then, becomes a synonym of *Lepiota aspera* (Pers. ex Fr.) Quél. (Enchir. 5. 1886) var. *aspera*, and what was currently called *Lepiota acutesquamosa* (Weinm.) Kummer, typical form (according to Kühner & Romagnesi, Flore anal. p. 397, letter "D") becomes *Lepiota aspera* var. **acutesquamosa** (Weinm.) Sing., *comb. nov.* (basionym, *Agaricus acutesquamosus* Weinm., *in* Syll. Pl. nov. **1**: 70. 1822).

Murrill is one of the few authors who, correctly, followed Quélet, and material under the name *Lepiota aspera* at FLAS collected and determined by him, is actually *L. aspera* var. *aspera*. Unfortunately, Murrill indicated *A. aspera* Pers. also as synonym of *Venenarius rubens* (Scop.) Murrill.

As for the *Amanita aspera* sensu Fr. and most modern authors, it is not a *Lepiota*, but a species related to but different from *Amanita rubescens*. Material from the Netherlands, studied by this author (L, det. Bas) is clearly not a form of *A. rubescens*, and should be known as *Amanita franchetii* (Boud.) Fayod.

AGARICUS BACILLARIS Pers., Mycol. eur. **3**: 200. 1828.

The type (L 910.256–1782) was collected in fall 1827 in Vincennes near Paris. It is in excellent condition. We have here one of the exceptional cases where the species published by Persoon and still traceable among his collections do not coincide with any known European species, at least if the macroscopical description is taken at face value which, in this case, can hardly be avoided.

The habit of the carpophores is much like that of a long-stemmed form of rather slender *Pseudoclitocybe cyathiformis*, or *P. coprophila* with adnato-decurrent to decurrent lamellae which are close, somewhat intervenose as described but now without any flesh-purple shades preserved. — Illustration: Fig. 6.

Spores 8–11.5 × 4.5–8 μ, mostly 9.5–10 × 5.7–6.5 μ, smooth, thin-walled, hyaline, ellipsoid to oblong, rarely somewhat reniform, amyloid. Basidia 31–52 × 8–11 μ, clavate, 4-spored, few 1–2-spored. What may be scattered cheilocystidia, basidiomorphous, but sometimes with irregular spinose outgrowths rather than

sterigmata. Hymenophoral trama regular, trama of pileus radially arranged, consisting of parallel hyphae; hyphae neither amyloid nor pseudoamyloid. Epicuticular layer consisting of slightly interwoven to subparallel hyphae which are repent and smooth, 3–14 μ broad, no incrusting pigmentation demonstrable in the material studied. Hyphae of the stipe without clamp connections, strongly interwoven, 2–7 μ broad.

This is without doubt a species of the genus *Pseudoclitocybe*. The macroscopical characters, particularly the color of pileus, stipe, and especially lamellae, do not coincide with any species of this genus. The combination **Pseudoclitocybe bacillaris** (Pers.) Sing., *comb. nov.*, is proposed. Fries, who generally guessed from the descriptions and figures published by Persoon—and guessed rather well considering that he had few data to go by—was completely mistaken in his attempts to identify this species with anything known to him. It would be highly desirable to look for clitocyboid species with purplish lamellae and amyloid spores in the surroundings of Paris, with an endeavor to rediscover and redescribe *P. bacillaris*.

AGARICUS BADIUS Pers., Syn. 279. 1801, *non* Weinm.

Type or authentic material (L 910.250–1465) is conserved, and since Fries's phrase "*A. badius* Pers. Syn. p. 279 inter hunc" (*Cortinarius purpurascens* var. *subpurpurascens*) "et *C. porphyropedem* ambigit" (Epicr. 265. 1836) may be understood as a revalidation by mention although in *Agaricus* a homonym had been previously published, we shall furnish the few data which we were able to gather from the specimen at L:

Lamellae broad, ventricose, sinuate, distant. Stipe tapering upwards, much longer than diameter of pileus. Spores 9.5–11.8 × 5.5–7 μ ellipsoid and somewhat acute below, pale rusty melleous because ornamentation (now) only vaguely punctate. Cystidia and cheilocystidia not seen.

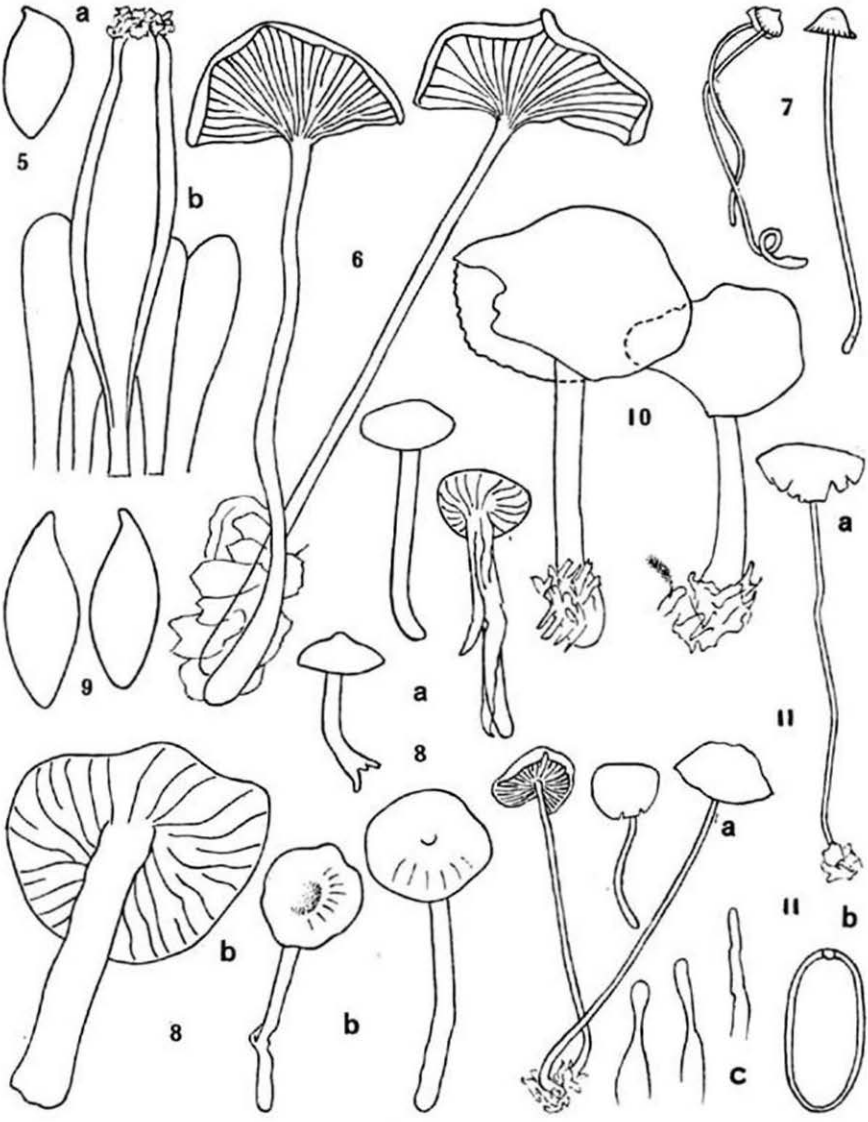
It will be up to the specialists of *Cortinarius* to decide whether a form determined by the description of Persoon, the characters of the specimen and its relationship to other *Cortinarii* of the same group actually exists and deserves specific recognition. In this case Persoon's specific epithet may still be used in *Cortinarius*.

AGARICUS BERTIERI Fr., Syst. mycol. **1**: 175. 1821.

The type of this species (as *Agaricus crinitus* L., Bertier no. 754, "in cortice putrido Bignoniae 5phyllae", from Guadeloupe) is L 910.256–1792.

EXPLANATION OF FIGURES 5–11

Figs. 5–11. — 5. *Agaricus argillaceus* Pers. ex Pers. a. Spores. b. Basidia and metuloid. — 6. *Agaricus bacillaris* Pers. Carpophores. — 7. *Agaricus citrinellus* Pers. ex Fr. Carpophores. — 8. *Agaricus coccineus* Schaeff. ex Fr. Carpophores from two sheets. a. From Sheet L 910.258–438. b. From Sheet L 910.258–441. — 9. *Agaricus colubrinus* Pers. (ex S. F. Gray). Spores. — 10. *Agaricus commistus* Pers. Carpophores. — 11. *Agaricus corrugis* Pers. ex Fr. a. Carpophores. b. Spore. c. Cheilocystidia.



Figs. 5–11

It has all the characters of *Agaricus crinitus* L. ex Fr. (see there) = *Panus crinitus* (L. ex Fr.) Sing. and is a synonym of the latter.

There is also another collection by Bertier under the number 754 which is labeled "*Agaricus barbatus* Bertier in cortice . . . Draconi Guad. (no.) 754" and "*Agaricus Bertieri* Fr. Syst. 1. p. 175. *A. crinitus* Bert." This is a syntype. It is also *P. crinitus*.

These are relatively thick-fleshy forms with close lamellae. The hosts of these specimens are *Bignonia pentaphylla* and either *Pterocarpus draco* or *Dracontium* sp.

AGARICUS BICONUS Pers., Syn. 317. 1801.

There is no type. The only specimen so determined in the Persoon Herbarium (L 910.250–1503) was collected and determined in 1821 by Chaillet (no. 45) with question mark and with no comment by Persoon.

This specimen is *Galerina tibiicystis* (Atk.) Kühner.

AGARICUS BRYOPHILUS (Pers., Syn. 385. 1801, as var. β of *A. hypnorum*) *ex* Fr. Syst. mycol. **1**: 267. 1821 as var. β "*A. Bryorum*") Pers., Mycol. eur. **3**: 277. 1828.

There is no type. The only specimen present is certainly not a *Galerina* (as is *A. hypnorum*). But it is not determinable.

AGARICUS BUBALINUS Pers., Mycol. eur. **3**: 24. 1828.

The type (L 910.256.1805) corresponds exactly to pl. 24 fig. 3a, b. It was described and illustrated from dry material from "Gallia" which is the one here preserved.

Persoon believed Fries's *Agaricus panuoides* to be a form of *A. atrotomentosus*. In his personal copy of "Systema mycologicum" he annotated "An var. *A. atrotomentosi*" under *A. panuoides*. Therefore he needed a name for what we now know to be *Paxillus panuoides* (Fr. ex Fr.) Fr.[1] He actually described this species twice, once as *A. bubalinus* Pers. and once as *A. scobigenus* Pers. (see there).

AGARICUS CANDICANS Pers., Syn. 456. 1801 *ex* Fr., Syst. mycol. **1**: 91. 1821.

There are two collections which are either type or authentic. One is marked "type" by me and is herewith designated lectotype of *A. candicans* in as much as there does not seem to be any contradiction between the *A. candicans* of Persoon and Fries's interpretation of 1821. This is L 910.250–1606.

This specimen has the curved base, size and habit of what is now accepted as true *Clitocybe candicans*, for example by Singer (1943) and Kühner & Romagnesi

[1] There is material collected by E. P. Fries 1852 and 1853 in Upsala, Sweden which is determined and actually represents *Paxillus panuoides* and which must be authentic in the sense of E. M. Fries. Such specimens are preserved and were studied by me at K, FH, and S. Furthermore, Fries himself corrected Persoon's interpretation of his species. On the other hand, Persoon's error in interpreting *A. panuoides* is not a grave one considering that the species is very variable, and that Fries himself called "*Paxillus panuoides* var." a specimen represented in Fries's unpublished collection of paintings executed under his direction (S) representing not a *Paxillus* but *Panellus serotinus* (Schrad. ex Fr.) Kühner (cf. Singer *in* Sydowia **6**: 456. 1951).

(1953), who accept the interpretation of Ricken (1915) which is this. The spores of the type are 4.3–5.2 × 2.3–3 μ and the hymenophoral trama is regular, of the *Clitocybe*-subtype.

There is another specimen determined with "?" which seems identical.

AGARICUS CANDICANS Pers. β ? TRITUS Pers., Mycol. eur. **3**: 109. 1828.

The only specimen so determined grew on leaves, apparently in France. It has close decurrent lamellae and spores broader than in the type of *A. candicans*, viz. 4.3–5 × 2.8–3.5 μ; basidia 15–16 × 3.8–4.8 μ, 4-spored. I believe that this is one of the forms of the stirps *Suaveolens*.

AGARICUS CAPERATUS Pers., Obs. mycol. **1**: 48. 1796 *ex* Fr., Syst. mycol. **1**: 241. 1821.

This is authentic material which is here proposed to be accepted as lectotypical. It comes from France, Villd'Avray, L 910.256–1802.

This was compared with modern material from the Netherlands. There can be no question about the identity of this with both Fries's concept of 1821 and with the interpretation, now generally accepted, of *Rozites caperata* (Pers. ex Fr.) Karst.

The only discrepancy is one that has to do with the deterioration of the cortinariaceous exosporium mentioned previously in this paper. The spores are merely faintly punctulate now, or completely smooth and therefore slightly smaller than normal (11–12.7 × 7–9.2 μ) but their shape and the pore-like papilla at the apex (callus) are perfectly typical. The basidia are 4-spored. The epicutis is made up of repent hyphae.

AGARICUS CARCHARIAS Pers., Disp. meth. Fung. 16. 1797 *ex* Secr., Mycogr. suisse **1**: 62. 1833; Fr., Epicr. 18. 1838 (as subspecies of *A. granulosus*).

The specimen in the Persoon Herbarium is authentic but marked "junior" (L 910.250–1473). Since there is not the slightest contradiction with Secretan or Fries, this is proposed as lectotype.

The spores are weakly but distinctly amyloid. KOH does not darken the cuticular zone. Macroscopically well agreeing with the modern concept (cf. Smith & Singer *in* Pap. Mich. Acad. Sci. **30**: 101. 1945) of *Cystoderma carcharias* (Pers. ex Secr.) Fayod.

AGARICUS CARNEUS Bull.; Pers. *ex* Fr. Syst. mycol. **1**: 130. 1821.

This is not authentic of Bulliard's concept but representative of Persoon's which is cited by Fries 1821 and may therefore be acceptable as lectotype of the species. It was collected in 1816 and may be the type of what Persoon later published as "*β carneus* . . . (Fries p. 130)". At any rate, there is no contradiction between Bulliard's illustration, Persoon's earlier description, and Fries's diagnosis.

Spores 5.2–5.8 × 3.2–3.5 μ, hyaline, smooth, ellipsoid; basidia 14–16 × 4 μ,

4-spored; cystidia, none; hymenophoral trama regular, its hyphae filamentous, hyaline, with clamp connections.

This is now called *Calocybe carnea* (Bull. ex Fr.) Kühner.

AGARICUS CARYOPHYLLAEUS Schaeff. *ex* Pers., Mycol. eur. **3**: 144. 1828.

This is the post-Friesian type of the species. It replaces *A. collinus* Pers., Syn. 330. 1801, non Fries, nec Pers., Mycol. eur. **3**: 143. 1828. It was collected by Raddi in Florence, L 910.256–1801.

It is in every regard a typical specimen of what we now call *Marasmius oreades* (Bolt. ex Fr.) Fr. The stipe is not glabrous! There is also material collected by Junghuhn in Germany, correctly determined as *A. oreades* Bolt. (L 910.256–1812).

AGARICUS CAUDICINUS Pers., Disp. meth. Fung. 19. 1797 *ex* Pers., Abh. essb. Schw. 119. 1822.

The authentic material preserved (L 910.256–1827) shows that the identification with *Agaricus mutabilis* Schaeff. ex Fr. was correct. This is *Kuehneromyces mutabilis* (Schaeff. ex Fr.) Sing. & Smith.

AGARICUS CAULICINALIS Bull. *ex* Pers., Mycol. eur. **3**: 156. 1828.

The type of this species is preserved (L 910.258–487);—it is type only in case I am not mistaken to assume that 1828 is the revalidating time and that the revalidating author's specimen is the type of the taxon.

This has all the characters of what Fries called *Agaricus stipitarius* Fr. Fries (*in* Linnaea **5**: 716. 1830) had already recognized this species as synonym of *A. stipitarius* and adds "et vix alius no. 256. *A. circellatus* p. 157" which is probably correct.

The accepted name for this species is *Crinipellis stipitaria* (Fr.) Pat. On the other hand, *A. stipitarius* sensu Schw. 1822 is *Crinipellis zonata* (Peck) Pat. as shown by material in the Schweinitz Herbarium.

AGARICUS CAUVINII Pers., Mycol. eur. **3**: 232. 1828.

The type (L 910.258–481) is *Hygrocybe laeta* (Pers. ex Fr.) Karst. Persoon had already anticipated the possibility that this is merely a variety of his species *Agaricus laetus* (l.c., p. 233). The specimen preserved will therefore also be significant for the typification of *A. laetus* Pers. ex Fr.

AGARICUS CHALYBEUS Pers., Syn. 343. 1801 *ex* Fr., Syst. mycol. **1**: 203. 1821.

The authentic specimen is much like the picture in Icon. pictae pl. 4 fig. 3–4. 1803. It is "*A. chalybeus* Pers. Syn. p. 343 *β serrulata γ nigrita*. In pascuis automno." (L 910.258–428). The spores are angular, 8–11 × 7–9.2 *μ*.

This would now be called **Acurtis chalybeus** (Pers. *ex* Fr.) Sing., *comb. nov.*, which would become *Rhodophyllus chalybeus* (Pers. *ex* Fr.) Quél. as soon as *Rhodophyllus* has been conserved.

Since I am not a specialist of the genus, I do not feel secure to say more than that

there are no contradictions, between this and *Agaricus chalybeus* sensu Fr., but I cannot tell whether it coincides with the modern concept e.g. of Romagnesi.

AGARICUS CIMICARIUS Pers., Mycol. eur. **3**: 86. 1828.

This, collected by Delastre around Poitou, on earth, and illustrated by Persoon (l.c., pl. 26 fig. 7), is the type of the name (L 910.256–1996).

Spores 5.7–7 × 3.5–4.3 μ; basidia 16–22 × 3.5–4.5 μ, clavate, 4-spored; cystidia, none. Hymenophoral trama regular, not gelatinized, of filamentous hyphae. Epicutis exclusively of filamentous hyphae, some rest of incrusting pigment visible, not gelatinous. Stipe consisting of hyaline filamentous hyphae with clamp connections.

Fries thinks (*in* Linnaea **5**: 708. 1830) that this is another form of the variable—according to him—*A. parilis* Fr.

The spores are smooth, ellipsoid to ovoid, with suprahilar depression—amyloidity not checked—and this would make it one of the still poorly known species around *C. trulliformis*, thus also close to *C. parilis* sensu J. E. Lange, but hardly identical with either of these. For the time being, I do not wish to propose a new combination.

AGARICUS CITRINELLUS Pers., Icon. Descr. Fung. 44 pl. 11 fig. 5. 1800 *ex* Fr., Syst. mycol. **1**: 155. 1821.

The type or authentic material (it is labelled only *A. citrinellus* Pers., L 910.258–433) is in good condition.

Spores 6.5–9.5 × 4–5.3 μ, smooth, ellipsoid, hyaline, very weakly amyloid; basidia 27–30 × 5.5–8.5 μ, mostly 4-spored, some 2-spored; cystidia, none; cheilocystidia with about 4 μ long diverticulations, edge gelatinized. Hymenophoral trama of broad voluminous hyphae which are pseudoamyloid. Epicutis gelatinized in a broad zone, hyphae imbedded and scattered in gelatinous mass, terminal elements ramose-diverticulate. Stipe undoubtedly with a gelatinous sheath. Clamp connections seen. — Illustration: Fig. 7.

This is evidently not *A. viscosa* with strong odor and broader spores and maculate lamellae. It is also not *Mycena subinamyloidea* Sing. which has 2-spored basidia and still less amyloid spores and especially hyphae, and likewise broad spores. It belongs therefore in the closest neighborhood of *M. epipterygia* (Scop. ex Fr.) S. F. Gray from which it differs in yellow pileus. It must be left to the specialists of the genus *Mycena* whether they prefer to recognize the yellow form as a species—*Mycena citrinella* (Pers. ex Fr.) Quél.—or a mere form or variety of *M. epipterygia*.

AGARICUS COCCINEUS Schaeff.; Pers., Obs. mycol. **2**: 39. 1799 *ex* Fr., Syst. mycol. **1**: 105. 1821.

Since Schaeffer's plate was interpreted as *A. coccineus* sensu Pers. respectively Fr. by both these authors, Persoon's specimens are a good illustration of both Schaeffer's and Fries's plants, and if the species is typified by Fries 1821, the reference to Persoon may and should be considered as determining the species and of the

two sheets L 910.258–438 and L 910.258–441, the former should be recognized as lectotypical. The latter is probably also this species although the specimen in the middle is something else, apparently *Hygrocybe punicea* (Fr.) Karst.

The type sheet consists of three carpophores, merely marked "*Agaricus coccineus*". They are macroscopically fully in line with the species now described as this species by modern European authors. The spores are 6.3–8 × 4.5–5.3 μ, ellipsoid, smooth, inamyloid. Clamp connections seen. — This is *Hygrocybe coccinea* (Schaeff. ex Fr.) Karst.

The specimen considered as probably belonging to *H. punicea* has spores 7–9.8 × 4.5–5.8 μ; basidia 37–54 × 5.7–8 μ, 4-spored, clavate. Trama and subhymenium subregular and not gelatinized. Clamp connections at base of basidia and on hyphae numerous.

Both sheets are illustrated, Fig. 8.

AGARICUS COCHLEATUS Pers., Disp. meth. Fung. 22. 1797 *ex* Fr., Syst. mycol. **1**: 177. 1821.

There is authentic material of this species at L (910.256–1810) from Meudon (near Paris), "autumno ad truncos, dedit Léveillé".

The spores are still strongly amyloid and agree with the spores of this species in modern treatments where it is known as *Lentinellus cochleatus* (Pers. ex Fr.) Karst.

AGARICUS COLUBRINUS Pers., Syn. 258. 1801 *ex* S. F. Gray, Nat. Arr. **1**: 601. 1821 (as *Lepiota*).

What I consider the type (L 910.258–488) is marked var. *α* (i.e. type variety), and is in good condition.

The spores are fusoid, 13–15 × 5.5–6 μ, not pseudoamyloid any more. — Illustration: Fig. 9.

This is obviously the same as *Agaricus clypeolarius* Bull. ex Fr. and *Lepiota clypeolaria* var. *typica* Kühner & Romagnesi (1953).

It should be known as *Lepiota clypeolaria* (Bull. ex Fr.) Kummer var. *clypeolaria*.

This specimen is particularly important because *Lepiota colubrina* (Pers.) S. F. Gray is the type of the generic name *Lepiota*.

There is also another sheet (L 910.258–437) which is named "*A. colubrinus?*" This is not *Lepiota clypeolaria* but *L. cristata* (A. & S. ex Fr.) Kummer! This is patently var. *γ. Agaricus cristatus* (Syn. 259).

There is, finally, a sheet (L 910.258–445) named "*A. colubrinus* (var.) colore lutescente". It is apparently the same as var. *pantherinus* Pers. (Syn. 259) of which I consider it authentic. This is not a *Lepiota*, but *Inocybe* sp.

AGARICUS COMITIALIS Pers., Syn. 352. 1801 *ex* Fr., Syst. mycol. **1**: 86. 1821.

A specimen preserved here (L 910.256–1799) comes from près (de) Paris. It looks macroscopically somewhat like *Clitocybe nebularis* and *C. clavipes* near which Fries (l.c.) who claims to have seen it ("v.v.") puts it. Modern authors do not

seem to know it well, neither has the present writer any definite opinion on it. I was unable to recover spores. The basidia are small, 16 × 3–4 μ. This cannot be interpreted with certainty. Since Fries knew it, it may be that his Icon. pl. 47 fig. 2 will throw more light on it.

AGARICUS COMMISTUS Pers., Mycol. eur. **3**: 97. 1828.

There is a sheet with two carpophores under this name in the Persoon Herbarium (L 910.256–1809) which I consider to be the type. The specimen is in good condition. At the base there is moss and débris.

Spores 6.3–7.3 × 4.7–5.3 μ, short ellipsoid, vaguely rounded-angular and uneven, subhyaline; basidia 25–31 × 5–6.3 μ. Base of basidia and stipe without clamp connections. Macroscopically, it shows a stature slightly more elongate and thinner than *Rhodocybe mundulus* (Lasch) Sing. usually exhibits, has strigose base but glabrous stipe above it, on the other hand it is "majusculus" (Persoon), i.e. slightly larger than *R. popinalis*, which in my experience has not such a strongly strigose base, and it has the center of the pileus distinctly depressed. It is said to have strongly bitter taste. Persoon describes the margin of the pileus in fresh material as light purplish eventually pallescent. — Illustration: Fig. 10.

In the key published by Kühner & Romagnesi, this species would key out with *R. popinalis* rather than with *R. mundulus*. And it seems best to interpret the specimen as a form near *R. popinalis* but with tendency to form transition towards *R. mundulus*. Fries (*in* Linnaea **5**: 710. 1830) refers this species to *Agaricus amarus*, var. [= *Leucopaxillus amarus* (A. & S. ex Fr.) Kühner] which interpretation is patently erroneous since the spores are quite different, and the hyphae clampless.

See also *A. amarellus* Pers.

AGARICUS CONOCEPHALUS Bull.; Pers., Syn. 427. 1801 *ex* Fr., Syst. mycol. **1**: 304. 1821.

The specimen here preserved (L 910.256–1834) is neither a type nor authentic for Bulliard's plant. Fries (l.c.) quotes both Bulliard and Persoon. He claims to have seen this species living ("v.v."), and if it is in agreement with Bulliard, Bull. pl. 563 would be the type. Since this plate is somewhat dubious it may also be claimed that Persoon, Syn. (description) might be considered lectotype and the specimen here preserved may serve as illustration. Nevertheless, it is questionable whether the latter can throw much new light on the situation, and it is also questionable whether Fries's redescription is identical with Persoon's interpretation in as much as Persoon in his personal copy of "Systema mycologicum" makes the annotation "conopilus!" which can mean only that Fries's "pileo obtuso" convinced Persoon that Fries's species is not the same as his. Nobody has since convincingly elaborated on *A. conocephalus* Bull. sensu Fries so that I am inclined to think that this species should be taken as a nomen dubium.

Persoon's specimen has verrucose spores 8 × 4.5 μ, and is apparently a *Cortinarius* sp. It was, like Bulliard's, collected "prope Parisios".

AGARICUS CORNUCOPIAE (Paulet, as *Dendrosarcos*) *ex* Pers., Mycol. eur. **3**: 37. 1828.

Material probably collected by Persoon and determined by him as *Agaricus cornucopiae* is preserved (L 910.256–1808) but not in very good condition. I find no spores, no metuloids, but numerous clamp connections. The hyphae, as far as I could observe, were all thin-walled.

These data do not help to form a more precise idea of what Paulet or Persoon had really in mind. It would perhaps be best to consider *A. cornucopiae* a nomen dubium at least until a better explanation of the facts can be provided. The interpretation given by many modern authors would call for forked lamellae at the base, and thick-walled tramal hyphae. However, it is possible that the species described by Kühner & Romagnesi (1953) in their key (and with which I am not fully familiar) has thinwalled tramal hyphae; it has a slight veil, and most veiled species of *Pleurotus* have thin-walled hyphae. If the interpretation of Kühner & Romagnesi is correct, the species should be known as *Pleurotus cornucopiae* (Paulet ex Pers.) Rolland.

AGARICUS CORRUGIS Pers., Disp. meth. Fung. 24. 1797 *ex* Fr., Syst. mycol. **1**: 298. 1821.

The only sheet with specimens accepted by Persoon as typical is L 910.258–411. It is in good condition, and is authentic.

This has the habit of a *Psathyrella* of the *Gracilis* stirps. The spores are 11.5–12.5 × 6–7 μ, ellipsoid to ellipsoid-subcylindric, sepia-fuliginous and almost opaque in KOH, deep brown in NH_4OH, purplish gray discolored in H_2SO_4, smooth, with complex wall, and a distinct apical germ pore. The cheilocystidia are 19–23 × 2.5–5.8 μ, cylindric or ventricose below, attenuate into a medium long neck above, neck sometimes capitate at apex (2–2.5 μ diameter) or else 1.7–2 μ diameter at tip, hyaline. The edge of the lamellae is heteromorphous and even now pallid from the cheilocystidia. The sides of the lamellae are black from the spores. The hyphae of the hymenophoral trama are regularly arranged and somewhat pale brownish. — Illustration: Fig. 11.

The analysis given above means that Bresadola's interpretation of the species is correct and that, furthermore, Kühner & Romagnesi's (1953) disposition of it as forma or variety of *P. gracilis* is likewise correct.

AGARICUS CORTICOLA Pers., Syn. 394. 1801 *ex* Fr., Syst. mycol. **1**: 159. 1821.

There are two sheets one of which (L 910.458–421) I suggest as lectotype.

Spores of various types and apparently different sources present; the subglobose ones most consistently appearing and taken to belong to these carpophores, inamyloid, some not reviving well, measuring about 6–7.5 × 5–7 μ now, smooth; basidia 24 × 5.7–7 μ; subhymenium subcellular. Hyphae of the hymenophoral trama filamentous, with slightly thickened walls, inamyloid. Hyphae of stipe with seemingly membranal pigment (necrotic?), inamyloid, with clamp connections. Pileus now 3.5 mm broad, stipe now 7.5 mm long. Epicutis of pileus near edge of

pileus margin containing some elements with diverticulate hyphae (diverticulation about 2 μ projecting). The base of the stipe is now velutinous but insititious. — Illustration: Fig. 12.

I was unable to find any spores large enough to correspond to the spores described from *Mycena corticola* in the sense of Kühner, A. H. Smith, and Kühner & Romagnesi. The spore walls of none of the spores recovered were amyloid. The tramal hyphae were all filamentous, never broad and voluminous. The cheilocystidia must be rare.

All this clearly excludes *M. corticola* as now described by the specialists, but coincides with *Omphalia corticola* Peck which, according to A. H. Smith (N. Am. Spec. Mycena 359) is *Mycena hiemalis* (Osb. in Retz. ex Fr.) Quél. The current interpretation of this variable species which is based on Gillet is not in disagreement with the facts found about Persoon's specimen. This, with clamp connections clearly seen, cannot be the bisporous form described by Kühner.

However, it is not fully clear whether the specimens with adnate lamellae (*M. hiemalis* ssensu A. H. Smith) to which Persoon's specimen belongs and to which his description refers should actually be considered as identical with *M. hiemalis* sensu Kühner (1938). They key out with *M. hiemalis* in Kühner & Romagnesi (1953) but they are apparently taken to be pigmented forms of *M. alba* in Kühner's monograph (1938). Consequently, the correct interpretation of Persoon's species was that of Bresadola, and *M. alba* (Bres.) Kühner respectively. *Mycena hiemalis* Osb. in Retz ex Fr.) Quél. becomes a synonym of *M. corticola* (Pers. ex Fr.) S. F. Gray. As for *M. corticola* sensu Pat., Kühner, A. H. Smith, it would seem that it has to be renamed *M. meliigena* (Berk. & Cooke) Sacc. It may be argued that Fries's diagnosis of 1821 includes forms with porphyry etc. colors which are characteristic for *M. meliigena* but he left no doubt that he considered the color indicated by Persoon as typical. Beyond that, there are no divergences in the descriptions, and consequently Persoon's type must be recognized as the type of *A. corticola*.

AGARICUS CRINITUS L., Spec. Pl. **2**: 1644. 1763 *ex* Fr., Syst. mycol. **1**: 175. 1821.

The specimen L 910.252–167 is one of the oldest preserved (200 years); I feel certain that it is part of the type of *A. crinitus*. It is still well preserved and represents without any doubt the species now known as *Panus crinitus* (L. ex Fr.) Sing. It is marked "*Agaricus crinitus* Linn. *Pocillaria* Brown. Species rara ex Jamaica inferiore". See also under *A. bertieri*. Some authors distinguish *A. bertieri* from *A. crinitus* as a thinner and (therefore) more deeply infundibuliform species. Neither the types nor the hundreds of personal collections I have studied bear out such a distinction on the specific level.

AGARICUS CUCULLATUS Pers., Syn., 372. 1801 *ex* Fr., Syst. mycol. **1**: 158. 1821, *non sensu* Hornem. (in Fl. dan. 1819; 1827).

The type labeled "*Agaricus cucullatus* Pers. Syn. Fung. Germania. *Mycena*?" is L 910.256–1755. It is in good condition.

On the type sheet there are three carpophores, two concrescent, with pilose-

mycelioid base, one separate, now glabrous everywhere except for the base; pileus conic or campanulate, vaguely striate subrugulose; lamellae close, ascendant, then subhorizontal, adnate, arcuate-subdecurrent, narrow. — Illustration: Fig. 13.

At the strigose base, there are distinct rests of leaves of frondose trees present.

Spores 9.2–11.5 × 3.5–4.3 μ, fusoid, smooth, inamyloid, hyaline; basidia 4-spored, 23 × 5.5–5.8 μ, clavate; cystidia, none; cheilocystidia making the edge of the lamellae heteromorphous, versiform, mostly fusoid or ampullaceous, but often with an irregular apex, even with double tip, hyaline, some incrusted, thin-walled, or almost so, e.g. 20–23 × 4.5–7 μ. Hymenophoral trama hyaline, regular, inamyloid, not formed by swollen voluminous elements but strictly filamentous; trama of pileus and stipe also inamyloid. Epicutis of pileus consisting of hyphae which are either diverticulate or have minute cystidioid outgrowths; minute pilose dermatocystidia-like bodies also observed on the surface of the stipe. Clamp connections numerous.

This is clearly the species which Kühner and this author called *Mycena* respectively *Hemimycena gypsea*, interpreting it in the sense of Ricken. Kühner admits (1938, p. 625) that Fries's descriptions "ne concordent pas bien les unes avec les autres". It is therefore lucky that there is a well documented species older than *A. gypseus* Fr. which will replace this latter as the basionym of the valid and correct name for the species in question as **Hemimycena cucullata** (Pers. ex Fr.) Sing., *comb. nov.*

Fries's attitude towards Persoon's species has changed between 1821 and his later works. At first (Syst. mycol. **1**: 158) he indicates it in a footnote under *A. griseus* as one of two species which "very probably also should be referred to this section". In Linnaea **5**: 713. 1830 however he makes it a synonym of *Agaricus* (*Mycena*) *laevigatus* Lasch although, even if this were correct, which it is not, *A. laevigatus* would become a synonym of *A. cucullatus!*

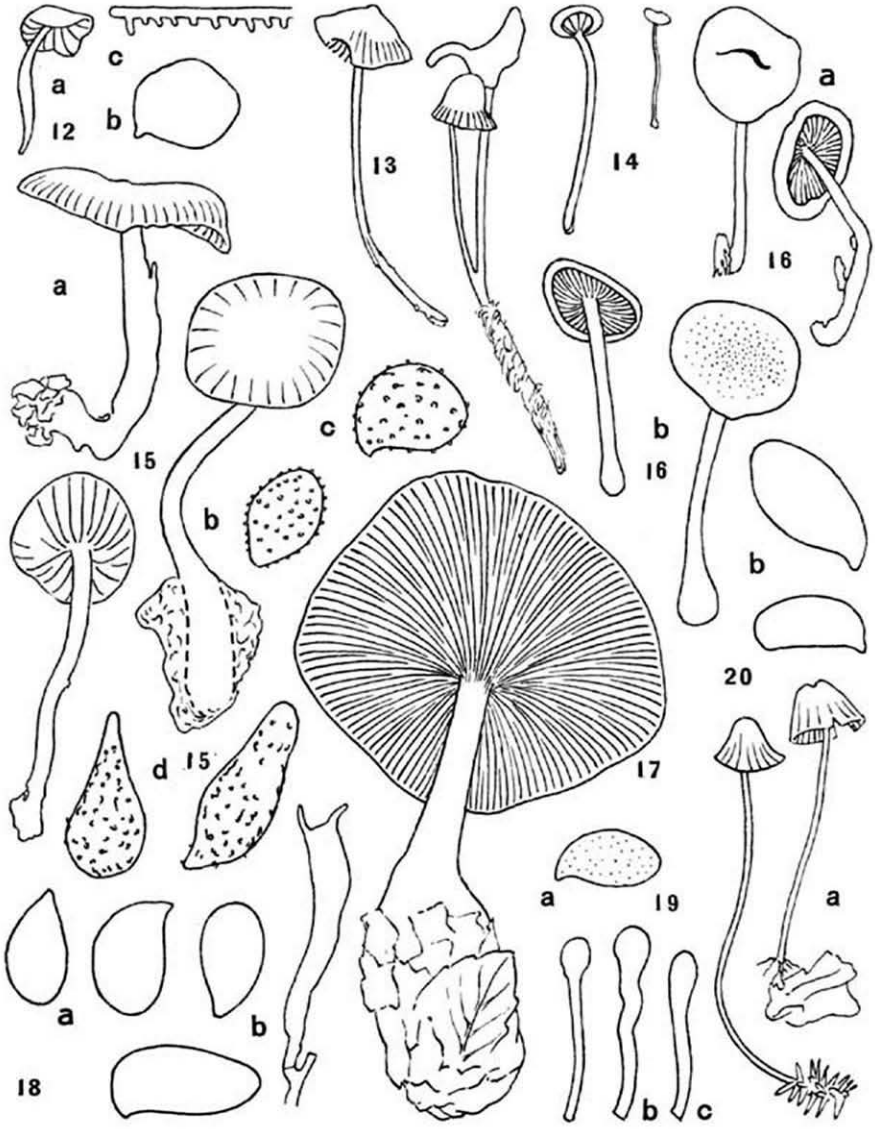
Agaricus cyaneus

This is neither *A. cyaneus* Bull. nor *A. cyanus* Pers., Syn. 276. It must be a herbarium name. L 910.258–427.

Agaricus cyanoxanthus Schaeff.—See *Russula cyanoxantha.*

EXPLANATION OF FIGURES 12–20

Figs. 12–20. — 12. *Agaricus corticola* Pers. ex Fr. a. Carpophore (× 2). b. Spore. c. Epicuticular hypha. — 13. *Agaricus cucullatus* Pers. ex Fr. Carpophores. — 14. *Agaricus dispersus* Pers. Carpophores (one, × 1, one, × 2). — 15. *Agaricus eumorphus* Pers. ex Pers. a. Carpophores. b–d. Spores, b, normal spore, c, exceptionally broad spore, d, especially elongated spores. — 16. *Agaricus fastibilis* Pers. ex Fr. a. Type carpophores, collection with large spores (not the lectotype). b. Type carpophores "cum cortina", lectotype, the small spored collection. — 17. *Agaricus gilvus* Pers. ex Fr. Carpophore. — 18. *Agaricus grossulus* Pers. a. Spores. b. Basidium. — 19. *Agaricus laevis* Pers. a. Spore. b, c. Caulocystidia. At left cheilocystidium — 20. *Agaricus leucopilus* Pers. a. Carpophores. b. Spores.



Figs. 12–20

AGARICUS DISPERSUS Pers., Mycol. eur. **3**: 161. 1828, *non* Fr., Epicr. 122. 1838.

The type (L 910.258–275) is one of two sheets which bear the name *A. dispersus* Pers. The other sheet has umbonate pilei which is in contrast with Persoon's description and cannot be taken as lectotype material. The type sheet consists of nine specimens, all in good condition and identical with each other. They were well described by Persoon (l.c.). — Illustration: Fig. 14.

Spores 5.3–7 × 3.8–5.3 μ, many collapsing in preparation, very pale ocher brownish, finely rugulose-rough, ellipsoid to broadly ellipsoid, without germ pore or callus, without plage; basidia 20–21(–23) × 6.3–7 μ, clavate, 4-spored; cheilocystidia not found. Epicutis of pileus consisting of repent hyphae, hyaline.

This shows *A. dispersus* Pers. to be the same as *Tubaria autochthona* (Berk. & Br.) Sacc. Since *A. dispersus* is much older a name we propose the combination **Tubaria dispersa** (Pers.) Sing., *comb. nov.*

Fries interpreted Persoon's species as one of the small forms of *Agaricus furfuraceus* which means that he came very close to the actual position of the species inasmuch as he was not familiar with *T. autochthona*.

Fries described later under the same binomial (*Agaricus dispersus*) a species which is completely different and belongs in *Naematoloma*.

AGARICUS DISSEMINATUS Pers., Comm. Schaeff. 87. 1800 *ex* Fr., Syst. mycol. **1**: 305. 1821.

The type is Schaeffer's plate which, according to Persoon depicts a rather young stage of this species. But there is authentic material in the Persoon Herbarium which was collected by Junghuhn in Germany and which corroborates the present-day interpretation of *A. disseminatus* Pers. [= *Coprinus disseminatus* (Pers. ex Fr.) S. F. Gray].

AGARICUS ELATINUS Pers., Mycol. eur. **3**: 18. 1828.

The type (L 910.256–1753) was collected by Mougeot in the Vosges. There is also a paratype (L 910.258–547) collected by de Chaillet.

The type description misspells the collector's name, and the type label doubtfully indicates Paris as type locality, which is likewise erroneous. The illustration (l.c., pl. 24 fig. a, b) compares well with the specimens.

This has all the characters of *Panellus violaceofulvus* (Fr.) Sing. ("Batsch"), and is indeed a synonym of it.

Persoon himself thought *A. violaceofulvens* a variety of this. Fries (*in* Linnaea, l.c., p. 702) also indicates identity with *A. violaceofulvens* Batsch and Fries (Syst. mycol. **1**: 276. 1821).

AGARICUS EPIPTERYGIUS Scop. *ex* Fr., Syst. mycol. **1**: 155. 1821.

Since Fries (l.c.) refers to Scopoli and Persoon, it may be of interest to note that all three of Persoon's sheets of this species represent typical *Mycena epipterygia* (Scop. ex Fr.) S. F. Gray. This is also interesting with regard to *Agaricus citrinellus* (q.v.).

AGARICUS EPIGAEUS Pers., Obs. mycol. **2**: 47. 1799 *ex* S. F. Gray, Nat. Arr. Br. Pl. **1**: 616. 1821 (as *Crepidopus*).

The authentic material of this species (L 910.256-1754) comes from near Paris. It has angular spores, 7–9.2 × 5.7–6.2 μ, symmetrical in the sense of Romagnesi. This is undoubtedly *Acurtis depluens* (Batsch ex Fr.) Sing. = *Rhodophyllus depluens* (Batsch ex Fr.) Quél. This synonymy was already anticipated by Persoon (Syn. 484. 1801) and accepted by Fries (Syst. mycol. **1**: 275. 1821).

AGARICUS ERICETORUM Pers., Obs. mycol. **1**: 5. 1796 *ex* Fr., Syst. mycol. **1**: 165. 1821.

There is one authentic specimen of *Agaricus ericetorum* Pers. which might also be the type and which is here proposed to be accepted as lectotype of the species (L 910.256–1888). Persoon's pl. 4 fig. 12 (op. cit.) is this (the colors containing white have darkened in the reproduction as in many whitish and light colored figures of that time).

Spores smooth, ellipsoid, 7–8 × 3.5–4 μ, inamyloid; basidia 16–26 × 4.5–5.2 μ, clavate, 4-spored. Clamp connections absent at base of basidia and on hyphae. Habit of a small *Omphalina* of its group.

This is undoubtedly the species recognized as *Omphali(n)a umbellifera* by this author as well as by Kühner and Romagnesi. It is the four-spored form or race.

This is very important because according to the International Code of Nomenclature, *A. ericetorum*, if identical, has to replace the binomial *A. umbelliferus* L. ex Fr. the latter being the type species of *Omphalina*.

The correct name for this species is consequently *Omphalina ericetorum* (Pers. ex Fr.) M. Lange.

Fries cited Persoon for form b of his *Agaricus ericetorum* but erroneously since this quotation belongs to form a, the type form, and therefore, this latter is identical with his *A. ericetorum* (Obs. mycol. **1**: 87. 1815). There can be no objection to recognizing Persoon's material as lectotype of Fries's species as revalidated in 1821.

There is also additional authentic material in the Persoon Herbarium which was collected by Junghuhn in Germany. This material consists of more immature carpophores with few mature spores recoverable; basidia 16–22 × 4.5–5.3 μ, 4-spored. Both base of basidia and hyphae without clamps. — This is likewise *O. ericetorum* (Pers. ex Fr.) M. Lange = *O. umbellifera* (L. ex Fr.) Quél.

Persoon described this same species once more from material sent to him by Mougeot (see under *Merulius turfosus* Pers.).

AGARICUS ERYTHROPUS Pers., Syn. 367. 1801 *ex* Fr. Syst. mycol. **1**: 122. 1821.

There are five specimens of this "species rarissima", one of which is particularly well preserved and doubtlessly accepted by Persoon as typical (L 910.258–577), and this is here proposed as lectotype. Although Fries inserted it in his group *Chondropodes* there is no major discrepancy in the diagnoses when comparing those of Persoon with that of Fries in 1821 whatever his later concepts may have been.

The spores are smooth and amyloid; the epicutis consists of hyphal elements which are radially arranged and diverticulate.

This would appear to be a *Mycena*, certainly not a *Collybia* or *Marasmius*. We should leave it to the specialists of *Mycena* to decide whether this is a synonym of another species revalidated or described in 1821 by Fries or a species which would require a transfer to *Mycena* of the specific epithet 'erythropus'.

At any rate, the species of *Collybia* which were at certain times identified with and determined as *Agaricus* or *Marasmius erythropus* should not any more be called so. *Marasmius erythropus* sensu Bres., Favre is **Collybia kuehneriana** Sing., *nom. nov.* (*Marasmius bresadolae* Kühn. & Rom., *Marasmius erythropus* sensu Bres., Icon. mycol. **10**: pl. 496 f. 1. 1929, with Latin description, typus, specimens depicted by Bresadola, l.c.). *Marasmius erythropus* sensu Maire is *M. torquescens* Quél. Kühner & Romagnesi (1953) seem to think that Fries's species (apparently of Hym. eur. 470. 1874) is neither one nor the other, and prefer to abandon the name *M. erythropus* for any species in *Marasmius* (or *Collybia*).

AGARICUS EUMORPHUS Pers., Syn. 342. 1801 *ex* Pers., Mycol. eur. **3**: 227. 1828.

Spores typically short ellipsoid, even ellipsoid-subglobose, 8–10 × 5.7–7.5 μ, but many abnormally elongated as in some Inocybes or Galerinas, irregular in shape and up to 14 μ long, strongly roughened in circumference, coarsely verrucose, deep ferruginous.

The pileus is now about 19–35 mm broad, the stipe up to over 50 mm long and 3–5 mm broad, not bulbous; pileus now deep brown, stipe now rather pallid and glabrous. The lamellae are broad, subdistant, and deeply sinuate. — Illustration: Fig. 15.

The specimen is probably the type and certainly authentic. It came from Germany, apparently Meissnerberg (L 920.258–581).

Fries thought at first (*in* Linnaea **5**: 727. 1830) that this describes forms of *A. anomalus*, i.e. he took it as conspecific with what we now call *Cortinarius anomalus*. Later on he modified his interpretation (Hym. eur. 369. 1874) indicating *A. eumorphus* as synonym of *Cortinarius anomalus* but with the qualification "(si *Cortinarius*)".

Two things become clear from the type analysis: First, *A. eumorphus is* a *Cortinarius*. Second, it is not *C. anomalus* since the lamellae are distinctly sinuate and the spores tending to be longer.

Henry (*in* Bull. Soc. mycol. Fr. **48**: 326. 1932) calls a species he believes to be *A. eumorphus* Pers. *Cortinarius persoonii* Henry, but this is precisely remarkable for the horizontal or subdecurrent lamellae so that here, too, doubts remain as to the correctness of his equation. I do not feel competent to propose a combination in *Cortinarius* at this time.

AGARICUS FARINACEUS Hudson; Pers., Syn. 453. 1801 *ex* S. F. Gray, Nat. Arr. Brit. Pl. **1**: 612. 1821.

There is no indication of a type earlier than material apparently determined

by Persoon as *A. farinaceus* "per totum autumnum in siluaticis apertis" and authentic for Persoon's view. Since there is a possibility that this may be recognized as a lecto- or neotype for the species revalidated under this name by Gray, we list it here (L 910.258–582).

This is the form generally common in open woods in southern England in fall, medium to large, with amethyst colored basal mycelium which becomes white when not very wet and fresh, and with spores intermediate between those of *Laccaria laccata* var. *laccata* and var. *proxima*. Spores round (e.g. 8 × 7.5 μ) to somewhat elongate (8.5 × 7 μ, 9.2 × 8 μ, 9.5 × 8 μ, 9.5 × 6.5 μ, 10.3 × 8 μ, with ornamentation); basidia 4-spored, 35 × 10.3 μ. Hymenophoral trama regular, with clamp connections.

AGARICUS FASTIBILIS Pers., Syn. 326. 1801 *ex* Fr., Syst. mycol. **1**: 249. 1821.

Since there are no discrepancies between Persoon's and Fries's diagnoses (Fries, *in* Linnaea **5**: 718. 1830!) both collections L 910.258–951 and L 910.258–593 of the Persoon Herbarium are eligible as lectotypes of the species. Of these, the one marked "*Agaricus fastibilis* P. (cum cortina)" has the smaller spores and both size and spores of what is now mostly accepted as *Hebeloma fastibile* (Pers. ex Fr.) Kummer. This latter sheet is here proposed as lectotype since it is undoubtedly authentic and might be the type of Persoon's species.

This collection has a pileus now about 16–22 mm broad, brown with a gilvous marginal zone, not umbonate; color of stipe not visible now, but described as whitish, now distinctly fibrillose from the veil in an apical zone, subglabrous below, longer than the diameter of the pileus, equal with somewhat broadened base (now 4–6.5 mm there). Spores 8.5–10 × 4.5–5.7 μ, now practically smooth, melleous, ellipsoid to fusoid-ellipsoid. Cheilocystidia not recovered. — Illustration: Fig. 16.

This, being as small as it is, and showing the copious cortina at the apex of the stipe, can hardly be the *H. fastibile* sensu Maire which is the *H. crustuliniforme* of Ricken, i.e. *Hebeloma sinapizans* (Paulet ex Fr.) Gill. sensu Kühn. & Rom. It can also hardly be *H. fastibile* sensu Kühn. & Rom. It seems closest to the species keyed out by the latter authors under the name "*Hebeloma strophosum* Fr." (p. 245). *Hebeloma strophosum* (Fr.) Sacc., however, was encountered by me in the Caucasus [*in* Beih. bot. Cbl. (II) **46**: 103. 1929 under *H.* (*Roumeguerites*) *mesophaeum* Fr. (var.?), with description!], where the spores were considerably larger than indicated by Kühner & Romagnesi. I have identical material from Cambridge, Mass., U.S.A., leg. & det. Singer (FH).

The second collection in the Persoon Herbarium is of the same size and shape, but has an umbo. The spores here are fusoid, melleous, 10.2–12 × 5.8–7 μ. I should think that this is the same as the species keyed out by Kühner & Romagnesi under "*H. testaceum* Fr." (in the sense of J. E. Lange). The *H. testaceum* in the sense of Bresadola seems to be the same as *Hebeloma fastibile* sensu Konrad, Kühner & Romagnesi (non Persoon). *Agaricus testaceus* Fr. might be the same.

The analysis of the type appears to be of particular importance inasmuch as

this species has been interpreted in many ways, and must be taken as the type species of the genus *Hebeloma*.

AGARICUS FICOIDES Bull. *ex* Pers., Mycol. eur. **3**: 97. 1828.

The specimen L 910. 258–603 may serve as type of the revalidating author. It is in plain agreement with the plate by Bulliard.

The specimen represents the species now generally and correctly called either *Hygrophorus pratensis* (Pers. ex Fr.) Fr. or *Camarophyllus pratensis* (Pers. ex Fr.) Kummer. This synonymy has been anticipated by Fries (*in* Linnaea **5**: 710. 1830), and has been accepted by all mycologists.

AGARICUS FOENISECII Pers., Icon. Descr. Fung. 42. 1800 *ex* Fr. Syst. mycol. **1**: 295. 1821.

The specimen conserved (L 910.258–609) does not agree with the figure given by Persoon for the type: it has smooth spores and is something different although undoubtedly coprinaceous. It can not be considered as type material of *Panaeolina foenisecii* (Pers. ex Fr.) Maire.

AGARICUS FRAGILIS Pers., Syn. 440. 1801 *ex* Fr., Syst. mycol. **1**: 57. 1821.

The specimen preserved is L 910.258–623. It is either authentic or type material, and in good condition.

This is the form with the dull purple pileus (not bright red). Spores about 9.8 × 8.5 μ, ornamentation of type IIIa, 0.4–0.7 μ high.

Since there is no discrepancy whatsoever between Persoon's and Fries's diagnoses, this specimen should be considered as lectotype. It fixes *Russula fragilis* (Pers. ex Fr.) Fr. in the sense it is accepted in Singer (*in* Hedwigia **66**: 214. 1926 as *R. emetica* ssp. *fragilis*), and Kühner & Romagnesi (Flore anal. 460. 1953). Some authors thought the bright red ("emetica-red") form to be typical, for example J. E. Lange and Bresadola, before them Corda and Patouillard. This however is *R. mairei* var. *fageticola* and *R. emeticella*, with lower ornamentation and other chemical reactions than the otherwise similar *R. emetica* (Schaeff. ex Fr.) Fr. and its subspecies (differing chemically) *Russula emetica* subsp. *lacustris* Sing. (*in* Rev. mycol. **15**: 133. 1950) which seems to be identical with *R. emetica* var. *silvestris* (Sing.) Kühn. & Rom. [basionym: *Russula emetica* subsp. *euemetica* f. *silvestris* Sing. *in* Beih. bot. Cbl. (II) **49**: 305. 1932].

It is very valuable to have a specimen which may serve as type of an important species like *R. fragilis* which is the type of the largest section of *Russula*, viz. section *Fragiles* Fr.

AGARICUS FUSCOPURPUREUS Pers., Icon. Descr. Fung. 12. 1798 *ex* Fr., Syst. mycol. **1**: 128. 1821.

The specimen L 910.258–622 is evidently the type since the carpophores preserved are two of those figured by Persoon (l.c., pl. 4 fig. 1). There is no discrepancy

between Persoon and Fries 1821 and the designation of the type is correct according to any interpretation of the present Code. The specimens are well preserved and contain plenty of spores.

Spores 5.5–7.5 × 2.2–3 μ, hyaline, smooth, cuneiform to cylindric or oblong, also some fusiform. Epicutis of the pileus irregular as in *Collybia dryophila*, consisting of filamentous repent hyphae (1.5–3.5 μ diameter) which run in all directions, and are beset by a now mellcous pigment, thickly granular in water but disappearing (now) in KOH (10 %) in some places, leaving scars and an uneven hyphal surface. Basal mycelium consisting of dark coarse strigose hairs, well preserved.

This is the same as *Marasmius fuscopurpureus* (Pers. ex Fr.) Fr. sensu Kühner but not sensu Kühner & Romagnesi. It is also the species of Ricken, J. E. Lange, and the present author, which was renamed *Marasmius obscurus* Favre, a synonym of *M. fuscopurpureus*. The *M. fuscopurpureus* sensu Favre is probably *M. hybridus* Kühn. & Rom., and the *M. fuscopurpureus* sensu Konrad & Maublanc, Kühner & Romagnesi, (non Pers. nec Fr.) remains without a valid name, as far as this author is aware.

Persoon's species as well as the other species named above should be classified in *Collybia*; the correct name of *A. fuscopurpureus* as analyzed here, is *Collybia fuscopurpurea* (Pers. ex Fr.) Kummer.

AGARICUS GALOPUS Pers., Obs. mycol. **2**: 56. 1799 *ex* Fr., Syst. mycol. **1**: 148. 1821.

What is either type or authentic material, and may well be accepted as lectotype of the species revalidated by Fries 1821 is in good condition under no. L 910.258–640. It is unquestionably the same species as the one nowadays called *Mycena galopoda* (Pers. ex Fr.) Kummer, type species of section *Lactipedes*.

AGARICUS GEOPHILUS Pers., Syn. 340. 1801 *ex* S. F. Gray, Nat. Arr. Brit. Pl. **1**: 608. 1821 (as *Gymnopus*).

The specimen L 910.258–673 is authentic and may be acceptable as lectotype of the name as spelled by Persoon. [1] It is in good condition, and no discrepancies exist between Persoon's conception and the compilation (from Persoon, in the majority of cases!) by Gray.

This has smooth, ellipsoid to coma-shaped (with one side applanate) brownish spores, 8–8.5 × 4.5–5.3 μ. The metuloids are striking and numerous. It is plainly the lilac form, i.e. the type form of what we now call *Inocybe geophylla* (Sow. ex Fr.) Kummer.

As for the white form, see under *Agaricus argillaceus* Pers. above.

AGARICUS GILVUS Pers., Syn. 448. 1801 *ex* Fr., Syst. mycol. **1**: 80. 1821.

L 910.256–1437 is an authentic collection in good condition, and should be

[1] I take *A. geophilus* as a binomial different from and therefore based on a different type than *A. geophyllus* Sow. ex Fr. The change in spelling was deliberate and the meaning of the epithet is completely changed by it.

recognized as lectotype of the species inasmuch as there is no contradiction between Fries 1821 and Persoon 1801 and 1828.

This grew in frondose woods near Paris and corresponds perfectly to the description given by Persoon. — Illustration: Fig. 17.

Spores 4.7 × 3.7 μ, rough, hyaline.

Among the species of modern authors, this coincides precisely with *Clitocybe flaccida* (Sow. ex Fr.) Kummer sensu Kühner & Romagnesi (Flore anal. 139. 1953) which should be renamed *C. gilva* (Pers. ex Fr.) Kummer. The species called *C. gilva* by Ricken is closely related but different. The species called *C. gilva* by Quélet is said to be the same as *C. alexandri*. Britzelmayr, judging by his spore measurements, must have misinterpreted *A. gilvus* also.

Whether the correct name for Persoon's species is *C. gilva* or *C. flaccida* must be decided in favor of the former because Fries says in 1821 that *A. flaccidus* is intermediate between *A. gilvus* and *A. gibbus* and clearly indicates the differences between *A. flaccidus* and *A. gilvus* but says nothing about the differences between *A. flaccidus* and *A. gibbus* which remain obscure until 1828. In fact, he gives *A. infundibuliformis* Schaeff. as synonym of *A. flaccidus* but in his later work he separates *A. flaccidus* from *A. infundibuliformis* by the glabrous pileus of the former and its yellowish lamellae whereas *A. gibbus* Pers. then becomes a synonym of *A. infundibuliformis*. The change in the description of the lamellae suggests that Fries has changed his mind on this species. Clearly, we have to take his 1821 concept for any species which is to compete with *A. gilvus* Pers. ex Fr. Thus, we believe that *A. flaccidus* Fr 1821 should be considered to be a synonym of *A. gibbus* and *A. infundibuliformis*. The *A. flaccidus* of Fries's later work is that of Persoon, Mycol. eur. **3**: 58. 1828, which he quotes (excl. Persoon's var. β which Persoon does not seem fully to identify with his own concept of *A. flaccidus*).

In the Persoon Herbarium there is also a second specimen of *Agaricus gilvus* collected by Junghuhn, and determined by him. This, however, can hardly be taken to be authentic (although there is no annotation by Persoon) since it is a small form and thus contradicts the diagnosis.

AGARICUS GOMPHUS Pers., Icon. Descr. Fung. 51. 1800.

Neither specimens (L 910.255–751 and L 910.255–641) nor description or figure (l.c., pl. 13 fig. 1) are in any way contradictory to Fries's diagnosis of *Agaricus rutilus*. *Agaricus gomphus* replaces *A. rutilus* of Persoon's "Commentarius" (1800: 22) in "Synopsis" (1801) which becomes clearer because of the citation of Sowerby, Engl. Fung. pl. 105.

Therefore, the specimen—either one of the two existing ones—may be taken not so much as lectotypes for *A. gomphus* (which has to my knowledge not been revalidated) but as lectotypes of *A. rutilus* (Schaeff. ex Fr.) Lund. & Nannf. inasmuch as *A. rutilus*, Comm. p. 22 as well as Sowerb. pl. 105 and *A. gomphus* Pers. are indicated in the revalidating diagnosis by Fries.

The specimens are both identical in every regard with the species described

in my monographs as *Gomphidius rutilus* (Schaeff. ex Fr.) Lund. & Nannf. (see Singer *in* Farlowia **2**: 533. 1946 and *in* Mycologia **41**: 473. 1949).

AGARICUS GRANULOSUS Batsch; Pers., Syn. 264. 1801 *ex* Fr., Syst. mycol. **1**: 24. 1821.

Although Persoon, "Synopsis", is the only source (along with Swartz) Fries quotes 1821 for the species as a whole, he indicates Batsch as author in the index and Batsch appears under form "b. pileo ferrugineo", p. 25. 1821, in the revalidating diagnosis. Those who would prefer a typification by the specimen preserved in Persoon's Herbarium (L 910. 255–590) which is authentic as far as Persoon's interpretation of Batsch's species and figure goes, should take into consideration that this has amyloid spores, and therefore belongs in a section different from the one of *A. granulosus* Batsch and the modern concept of *Cystoderma granulosum* (Batsch ex Fr.) Fayod (see Smith & Singer *in* Pap. Mich. Acad. Sci. **30**: 82. 1945).

It is here proposed that the form b of Fries (1821) with its respective reference to Batsch be taken as lectotype of the species in the sense of Fries.

AGARICUS GROSSULUS Pers., Mycol. eur. **3**: 110. 1828.

The type is L 910.256–1029 because the two specimens under this name in the Persoon Herbarium and on the sheet cited correspond exactly to the figure (l.c., pl. 26 fig. 6, not "Tab. XXVI. f. 2" as quoted by Persoon, a printing error!). The collection comes from near Paris.

There is a figure in pencil with descriptive notes. Both figure and notes correspond to the diagnosis and illustration quoted above.

Spores hyaline, 7–10.3 × 4.5–6.3 μ, smooth, without suprahilar depression, ovoid-ellipsoid to ellipsoid or ellipsoid-subcylindric, thin-walled, inamyloid; basidia 23–36 × 5.7–7.3 μ, cylindric-clavate to clavate, hyaline, 2–3–4-spored; cystidia none. Hymenophoral trama hyaline, irregular, consisting of strongly interlaced hyphae, not gelatinized. Epicutis not studied. Hyphae of stipe inamyloid, without clamp connections. The habitat was rotten wood since the analysis of substratum attached to the base of the stipe shows woody particles mixed with a little earth. — Illustration: Fig. 18.

The analysis given above together with the descriptive notes and drawings prove that this is the same species as the one called *Omphalina abiegna* (Berk. & Br.) Sing. by myself, and (erroneously) *O. wynniae* (Berk. & Br.) Orton [should be *O. wynniae* (Berk. & Br.) Ito which is rather a hygrophoraceous species] by Dennis, Orton & Hora, and *Omphalia abiegna* (Berk. & Br.) J. E. Lange by Kühner & Romagnesi (1953). *Agaricus grossulus* has evidently ample priority over the other names, and therefore the combination **Omphalina grossula** (Pers.) Sing., *comb. nov.*, is proposed.

Fries (*in* Linnaea **5**: 711. 1830) identifies *A. grossulus* with *A. umbelliferus*. L. ex Fr., Elench. 22. 1828, but it is evident that he meant to replace *A. ericetorum* Syst. mycol. **1**: 165. 1821 by this older (Linnaean) name but to include what he took for color varieties. In this broad sense of *A. umbelliferus*, it is certainly identical with

A. grossulus, *A. ericetorum* and a whole series of related species of *Omphalina* which we now separate from the typical *A. ericetorum* (q.v.). Later on (Hym. eur. 473) Fries changed his mind about *A. grossulus*, calling it a variety of *Marasmius languidus* which is demonstrably incorrect even without type analysis.

AGARICUS GRISEOPALLIDUS Desm., Pl. crypt. Nord de la France No. 120. 1826.
AGARICUS GRISEOLUS Pers., Mycol. eur. **3**: 87. 1828.

The latter species is based on the former and both are clearly identical, the latter being synonymous with the former. The specimen preserved at Leiden in Persoon's herbarium (L 910.255–835) is labeled *Agaricus griseus* Desma. which is an apparent *lapsus pennae* for either *A. griseopallidus* or *A. griseolus*, which, in the present case, makes no difference.

The specimen is identical with syntypes of *A. griseopallidus* studied by me before (LE portion, 1943) and is correctly known as *Omphalina griseopallida* (Desm.) Quél. *Agaricus griseolus*, of later publication date, becomes a synonym.

AGARICUS GUMMOSUS Pers., Mycol. eur. **3**: 101. 1828.

The type of this species (L 910.258–666) is preserved and in rather good condition. Spores 7–8 × 3.5–4.7 μ, hyaline. Hymenophoral trama bilateral.

This is one of the whitish species of *Hygrophorus* sensu stricto. Fries (*in* Linnaea **5**: 711. 1830) says: "A me ad *A. chrysodon* relatus fuit; an rite, dijudicent denùo observantes." Probably 'rite'!

This species was published in the same year another *A. gummosus*—now generally used—was published. This, Lasch's *A. gummosus*, is indicated in Syst. mycol. **3**, index, by Fries and, forming part of "Systema mycologicum", must be given preference over other names appearing in that period.

AGARICUS INTEGRELLUS Pers., Icon. Descr. Fung. 54. 1800 *ex* Fr. Syst. mycol. **1**: 161. 1821.

There is material which may be considered typical or at least authentic for Persoon's species (L 910.255–761), but this material shows that the species described by Fries [which is the one now called *Delicatula integrella* (Pers. ex Fr.) Fayod] is different. Indeed, Persoon's specimens have distinct not venose lamellae which is likewise in agreement with Persoon's description. If in spite of the discrepancy the type of Persoon's were recognized for the species as a whole, *Delicatula integrella* sensu autt. mod. would have to be renamed. This author interprets the Rules so as to typify *A. integrellus* by the type(–description in this case) of the revalidating author, i.e. by Fries.

Agaricus integrellus Pers. non Fr. is a species of *Mycena* or *Hemimycena* which I have not attempted to identify.

AGARICUS LAEVIS Pers., Mycol. eur. **3**: 164. 1828.

The type (L 910.255–762) corresponds to the figure, l.c., pl. 25 fig. 1. It agrees

with the diagnosis and was collected as indicated there, "prope Parisios". The type specimen was already annotated by C. Bas whose observations coincide with mine.

Spores 7–8 × 4.3–5.7 μ, verruculose-punctate, the exosporial ornamentation not well preserved (as in many Cortinariaceae), so that a large percentage of the spores appear to be subsmooth, ellipsoid, without plage, ochraceous melleous; basidia 23.5–29 × 6–8 μ, 4-spored; cystidia, none seen; cheilocystidia about 28 μ long, 1.5–2.5 μ thick, capitate (rarely clavate at apex), the tip 2.5–4 μ thick, filamentous below. Dermatocystidia on pileus and stipe numerous, hyaline, much like the cheilocystidia. Veil remnants, none seen. Hyphae of stipe without clamp connections. — Illustration: Fig. 19.

This coincides with material previously seen by me, collected by von Höhnel, Michelsberg bei Stockerau, Nieder-Oesterreich, Austria, 28–X–1906, determined (FH) as *G. hypnorum* but identical with the species described by Kühner (Le Genre Galera 168. 1935) as *Galerina graminea* (Velenovský) and "très probablement" (Kühner, l.c., p. 170) the species described as *Galera graminea* Velen. by Velenovský. This latter species becomes now a synonym of **Galerina laevis** (Pers.) Sing., *comb. nov.*

Fries (*in* Linnaea **5**: 717. 1830) claims that *A. laevis* as for its illustration in "Mycologia europaea", is exactly *Agaricus pusiolus* Fr. "p. 262". What he means is *A. pusillus* Fr., Syst. mycol. **1**: 264. 1821 = *A. pusiolus* Fr., Elenchus **1**: 36. 1828, thus a species published in the same year as Persoon's. It may be said that in the first place, the two species do not fully agree even in their diagnoses, secondly the Friesian species has not been considered as a well defined and interpretable (cf. Singer *in* Acta Inst. bot. Acad. Sci. URSS II **6**: 492. 1950) species of *Naucoria* until Métrod (*in* Rev. mycol. **11**: 79. 1946) recognized in it an *Agrocybe*, *A. pusiola* (Fr.) Métrod, a fungus very different from Persoon's.

AGARICUS LEIOPUS Pers., Disp. meth. Fung. 21. 1797 *ex* Pers., Mycol. eur. **3**: 140. 1828.

The type of this species (L 910.255–763) is in good condition. This corresponds closely to the dark form of *Collybia butyracea* (Bull. ex Fr.) Kummer which I determine as f. *asema* (Fr.) Sing. but which Fries, Ricken, and A. H. Smith consider a separate species. Kühner & Romagnesi seem to agree with this writer as to the impossibility to separate *A. asemus*. Indeed, Fries did not differentiate between the color forms as such as rather between a more thick-and soft-fleshy species (*A. butyraceus*) and a thin species (*A. asema*), but according to my experience there is no correlation between these characters. Persoon himself (1828) had already put *A. asemus* Fr. in synonymy with *A. leiopus* which he thought too close to *A. butyraceus!*

AGARICUS LEPTORHIZUS Pers., Mycol. eur. **3**: 256. 1828.

The type (L 910.255–666) is well preserved.

Spores (5.3–)7.5–8 × (3–)3.5–4.5 μ, ellipsoid, smooth, hyaline, inamyloid; basidia 17–21 × 4.5–6.7 μ, 4-spored; cystidia, none, but some basidioles (?) broader than the basidia reaching 17.8–22 × 7.5–11 μ; cheilocystidia not differentiated.

Hymenophoral trama regular, consisting of thin filamentous hyphae which are somewhat interwoven, fuscidulous-hyaline in NH_4OH, inamyloid. Epicutis of repent hyphae forming a cutis, pale fuscous, no diverticulate elements visible.

This, in connection with the type description makes it quite clear that we have here a later synonym of *Agaricus rancidus* Fr. the correct name of which is: *Lyophyllum rancidum* (Fr.) Sing.

Fries guessed at *A. umbratilis* β, later at *A. protractus*—neither guess very revealing, and both unlucky.

AGARICUS LEUCOPHAEUS Pers., Mycol. eur. **3**: 73. 1828; *non* ibid. p. 219.

The type (L 910.255–795) is well preserved. It comes from France.

Spores 4.5–5.5 × 3.5–4 μ, some slightly angular, echinate-rough, (not an exosporial ornamentation!), light brownish; basidia 14–16 × 4.5–6 μ, 4-spored. Hyphae of stipe with clamp connections. — The margin of the pileus is not ciliate now but it is not costate either and the spores are too small for *Ripartites helomorpha* (Fr.) Karst. Therefore, we conclude that the type is *Ripartites tricholoma* (A. & S. ex Fr.) Karst. as Fries had already stated in his index to the third volume of "Systema mycologium" and *in* Linnaea **5**: 706. 1830.

AGARICUS LEUCOPILUS Pers., Mycol. eur. **3**: 268. 1828.

The type (L 910.255–781) has numerous and well preserved amyloid spores, 7–11.5 × 3.5–7 μ and smooth, and there are both 2- and 4-spored basidia present, but the author has seen no cystidia on the sides of the lamellae (but they may have collapsed entirely) and the elements of the edge are not well preserved. There were only a few doubtful cheilocystidia. The hymenophoral trama consists of broad and short amyloid elements and the epicutis seems to be slightly gelatinized and thin; some distinctly diverticulate elements seen, these radially arranged. — Illustration: Fig. 20.

I do not dare identify this species with any of the modern taxa inasmuch as the cystidial elements were inconclusive for me. It is possible that a specialist of the genus, sectioning the specimens carefully might come to a more positive conclusion. At any rate, this is a species of *Mycena* in the narrowest sense.

Fries (*in* Linnaea **5**: 730. 1830) does not find the slightest difference between this and *Mycena galericulata* (Scop. ex Fr.) S. F. Gray.

AGARICUS MEGALUS Pers., Mycol. eur. **3**: 170. 1828.

The type (L 910.256–1665) was collected by Cordier.

Spores 7–10.3 × 5.7–8 μ, smooth and slightly thick-walled. Macroscopically, it resembles the large forms of *Oudemansiella radicata* (Relhan ex Fr.) Sing. It is undoubtedly a later synonym of that species. Fries (Hym. eur. 113) synonymizes this (as *A. megaleus* Pers.) with *A. prolixus* Fr. *Collybia prolixa* (Hornem. ex Fr.) Gillet is now understood to be a form of stirps *Maculata* of *Collybia* in the narrowest sense, and has much smaller spores. This latter species is unknown to me.

AGARICUS MERULINUS Pers., Mycol. eur. **3**: 17. 1828, *non* Wallr. 1833.

The type is distributed on two sheets. We have examined material from L 910.255–848 which we consider the monotype. The carpophores are somewhat scanty but revive well.

Spores 7–7.2 × (3.5–)4.5–4.8 μ, ellipsoid, smooth, inamyloid; basidia 20–29 × 5.2–7 μ, clavate, 4-spored; cystidia on sides of lamellae, none, but there are (on edges, mainly near the margin of the pileus?) some capitate elements which are larger than the basidia, but rare in my preparations, hyaline and with rather thin walls, smooth and entire, 37–44 × 4.5–5.2 μ. Epicuticular layer characteristically 'asterostromelloid' (i.e. not as in *Asterostromella*, but rather as in *Asterotus* and *Campanella* spp.) with transitions to 'Rameales'-structure, at any rate diverticulate to repeatedly short-ramulose under wide angles. Tramal hyphae distinctly thin-filamentous and wavy in a gelatinous mass, with numerous clamp connections, some like medallion-clamps.

The fruiting bodies are said to have been white to green, the lamellae branching, the stipe short and inconspicuous.

This is the first species of *Campanella* ever collected in Europe and no other representative of this mainly exotic genus has been found until 1958 (comm. Bas, L). The two finds are not identical with each other. It appears that the French collection which was made at the end of October 1816 in a park (some "viridarium", as Persoon says) in or near Paris, France, on the base of a trunk, is an adventitious species, and for that reason has not been rediscovered.

Among the known exotic species of the genus there is none that might be considered identical. The green species without cystidia or with few and inconspicuous ones are *C. aberrans* Sing. and *C. aeruginea* Sing. Especially the former is very close to Persoon's species, but differs in spore characters. The combination **Campanella merulina** (Pers.) Sing., *comb. nov.*, is proposed.

Fries (*in* Linnaea **5**: 701–702. 1830) thought this were "not even varieties of", i.e. fully identical with, *Agaricus applicatus*, an obvious mistake!

AGARICUS MESOPHAEUS Pers., Mycol. eur. **3**: 173. 1828.

The type (L 910.255–852) is well preserved. Spores 9–11 × 5.5–6 μ, now (as in many cortinariaceous forms) smooth to very slightly punctulate (see introduction!), ellipsoid-subamygdaliform, light brownish, without plage. — Illustration: Fig. 21.

The macroscopical characters agree well with the description and also with the concept of Fries and the modern concept (for instance, Kühner & Romagnesi, Flore anal. 245. 1953), and so do the spores.

Many authors cite the Persoonian species preceded in his treatments by an asterisk as if they were varieties or subspecies of the preceding species. They are however, according to Persoon's own explanation (cf. D.R.P., A.M.R., E.V.S., Index Persoonii Mycol. eur. 3. 1942) to be taken as autonomous species. The correct name for the species analyzed above is therefore: *Agaricus mesophaeus* Pers. = *Hebeloma mesophaeum* (Pers.) Quél.

AGARICUS MITIS Pers., Obs. mycol. **1**: 54. 1796 *ex* Fr., Syst. mycol. **1**: 188. 1821.

Both collections (L 910.255–656 and 910.255–834) are certainly authentic. Particularly the one on conifer branchlets which corresponds well with l.c., pl. 5 fig. 3, may well be the type. It should be accepted as lectotype inasmuch as there is not the slightest discrepancy between this and the descriptions given by Fries.

The spores are still (after at least 165 years!) distinctly amyloid, oblong, smooth.

This is now known as *Panellus mitis* (Pers. ex Fr.) Sing.

AGARICUS MUCIDUS Schrader; Pers., Syn. 266. 1801 *ex* Fr., Syst. mycol. **1**: 28. 1821.

For the understanding of the revalidation diagnosis by Fries (1821) which states that the pileus is "plerumque candidus", it is not without interest that Persoon considered type variety the pure white form while under var. β all the literature inclusive of Schrader's orginal account are listed. It is therefore significant that the specimen bearing the name *A. mucidus* in the Persoon Herbarium is precisely that species, i.e. *Oudemansiella mucida* (Schrader ex Fr.) Höhnel.

AGARICUS MYOMYCES Pers., Disp. meth. Fung. 20. 1797 *ex* Fr., Syst. mycol. **1**: 44. 1821.

The specimen L 910.261–111 of the Persoon Herbarium is simply labeled *Agaricus Myomyces* P. without further data. It is undoubtedly authentic and perhaps the type. It is here treated as representing Persoon's concept of this species as compared with Fries's.

All the other sheets under this name were originally determined by other names, and later corrected to *A. myomyces*; they are therefore considered as less likely to represent the form Persoon had primarily in view.

Spores 5.7–7 × 3.5–4.5 μ, hyaline, smooth, ellipsoid. Hymenophoral trama strictly regular, hyaline. Epicutis of parallel hyphae 4.5–12 μ broad. Clamp connections, none.

The aspect of the carpophores as well as the preceding data on the microscopical characters make this identical with what we now call *Tricholoma terreum* (Schaeff. ex Fr.) Kummer. However, the revalidation diagnosis by Fries is quite evidently not the same species. Although *A. terreus* Schaeffer (pl. 64) is cited in the first place, Persoon is quoted with a question mark and the description indicates a mixture of at least two species which can be enumerated: (1) the reddening context indicates *A. saponaceus* Fr. ex Fr. and Fries himself (1830) interprets his species as *A. saponaceus*, (2) the mouse-odor contradicts this, and the yellow-gilled variety confirms that there is a second element viz. *Tricholoma scalpturatum* (Fr.) Quél. = *A. argyraceum* (Bull. ex St-Amans 1821) Gillet = *A. myosmus* Pers. 1828. This was the interpretation given by Persoon, J. E. Lange. Persoon in his personal copy of "Systema mycologicum" annotated *A. myomyces* Fr. with "non Pers." and even went so far as to propose a novum nomen (Mycol. eur. **3**: 203. 1828).

Since then according to statements by all authors involved, *A. myomyces* sensu Pers. is different from Fries's interpretation, the recognition of the Persoonian

type means that our generally known European *Tricholoma*, *T. terreum*, quoted everywhere and used as an edible mushroom in many parts, becomes *T. myomyces* (Pers. ex Fr.) J. E. Lange (but non sensu Lange). By recognizing the revalidating author's type, one would either designate the species as nomen confusum (Orton), or select as lectotype the element (2) above indicated whereby a species less known and variously named by modern authors would receive the epithet 'myomyces'.

AGARICUS NECATOR Bull.; Pers., Syn. 435. 1801 *ex* Fr., Syst. mycol. **1**: 64. 1821.

The specimen under this name in the Persoon Herbarium is undoubtedly this species in the sense of Karsten and Singer, viz. *Lactarius necator* (Bull. ex Fr.) Karst. While the original plate is not well executed as far as color is concerned, the first interpretation (Persoon) and revalidating diagnosis leave no doubt about its identity with a fungus now often called *Lactarius turpis*. Its rejection as nomen confusum as proposed by Dennis, Orton & Hora, is unacceptable because in this case there is no confusion whatever. The meaning of the epithet is certainly inadequate ('murderer') but the species was then generally considered as poisonous except in Russia; on the other hand, *Agaricus turpis* suggests just the same thing, a strange fact considering that Weinmann, its author, wrote in Russia.

This apparent contradiction can be explained by reading the original diagnosis of *Agaricus turpis* Weinm. (*in* Syll. Pl. nov. **2**: 85. 1826): "... pileo ... sordide-flavo vel cupreo, nigredine obducto, ... margine lutescente ... fragilis ... stipes ... ½ unc. crassus..." Of course, this is *not* the so-called *L. turpis* of some modern authors inasmuch as Weinmann in the same paper also enumerates *A. torminosus* and *A. necator*.

Even though some authors are now accustomed to the wrong name, there just is no historically correct and nomenclatorially acceptable way of rejecting the epithet 'necator'.

AGARICUS OCHRACEUS Pers., Mycol. eur. **3**: 264. 1828, *non* Bull. ex St.-Amans, Mérat, 1821, *nec* Wulfen ex Zant. 1821.

This binomial designates a species different from the earlier binomials quoted above. Its type (L 910.261–136) represents therefore a homonym to be abandoned inasmuch as no precise determination is possible. The spores are 6.3–7 × 3.8–4.5 μ, hyaline, smooth, and inamyloid. The epicutis shows some diverticulate hyphae.

The specimen is labeled *A. nanus* Bull. = *ochraceus* Pers. which probably refers to *Agaric nain* = *A. pumilus* Bull., a species impossible to determine.

Fries (1874) thinks this and *A. leucopilus* to be synonyms of his *A. gypseus*, but this makes *A. gypseus* even more puzzling since *A. leucopilus*, as we have seen, has amyloid spores while *A. ochraceus* Pers. has inamyloid spores. I am afraid that *A. gypseus* cannot be interpreted any more, and has to be taken for a nomen dubium.

AGARICUS OPACUS Pers.—See under *A. tabularis* Pers.

AGARICUS PASCUUS Pers., Syn. 427. 1801 *ex* Fr., Syst. mycol. **1**: 205. 1821.

Material undoubtedly authentic, and perhaps the type, is represented in the

Persoon Herbarium under L 910.261–139. It does not disagree with the diagnosis but does not agree with Fries's concept.

Spores about 12.7 × 7.5 μ, broadly fusoid-ellipsoid, rusty melleous, with spinulose-verruculose exosporium. General aspect also that of a cortinariaceous species. — Illustration: Fig. 22.

This material is important because for those who accept pre-Friesian types where the diagnosis or the type specimens of the revalidating author disagree. In the present instance, *A. pascuus* Pers. would become a *Cortinarius* sp. or anyhow a cortinariaceous species while, at the same time, *Agaricus pascuus* Pers. ex Fr. is the type species of the genus *Nolanea*. Of course, since it disagrees with the diagnosis of that genus in several points, it would have to be rejected as generic type, and another lectotype be selected.

For those who, like the author, do not recognize pre-Friesian types in this kind of situation, the description of *A. pascuus* given by Fries 1821 would become the type. Romagnesi thinks that this species is a species collectiva although all its component forms seem to enter in *Nolanea*.

AGARICUS PHACELLUS Pers., Mycol. eur. **3**: 112. 1828.

The type is L 910.256–1723; it was found near Paris, France. It is in rather good condition.

Spores 4–5.5 × 2.3–3.5 μ, hyaline, smooth, ventricose to ellipsoid or ellipsoid-oblong, inamyloid; basidia 13–15(–17) × 4–5.3 μ, small, clavate, 4-spored; cystidia and cheilocystidia, none. Hymenophoral trama regular, consisting of medium broad, inamyloid hyphae. Epicutis of pileus consisting of hyphae which are radially arranged and filamentous, in part incrusted by a hyaline incrustation, otherwise not ornamented, or ramified, with clamp connections.

Description, external aspect, and the above analysis confirm that this is the same as *Collybia cirrata* (Pers. ex Pers.) Quél. *Collybia cirrata* was revalidated by Persoon the same year as he described *A. phacellus*. We give preference to the former name.

AGARICUS PHAEOCOMIS Pers., Mycol. eur. **3**: 192. 1828.

The type (L 910.261–130) is in good condition.

Edges of lamellae very slightly darker than sides; stipe not squamose. Spores

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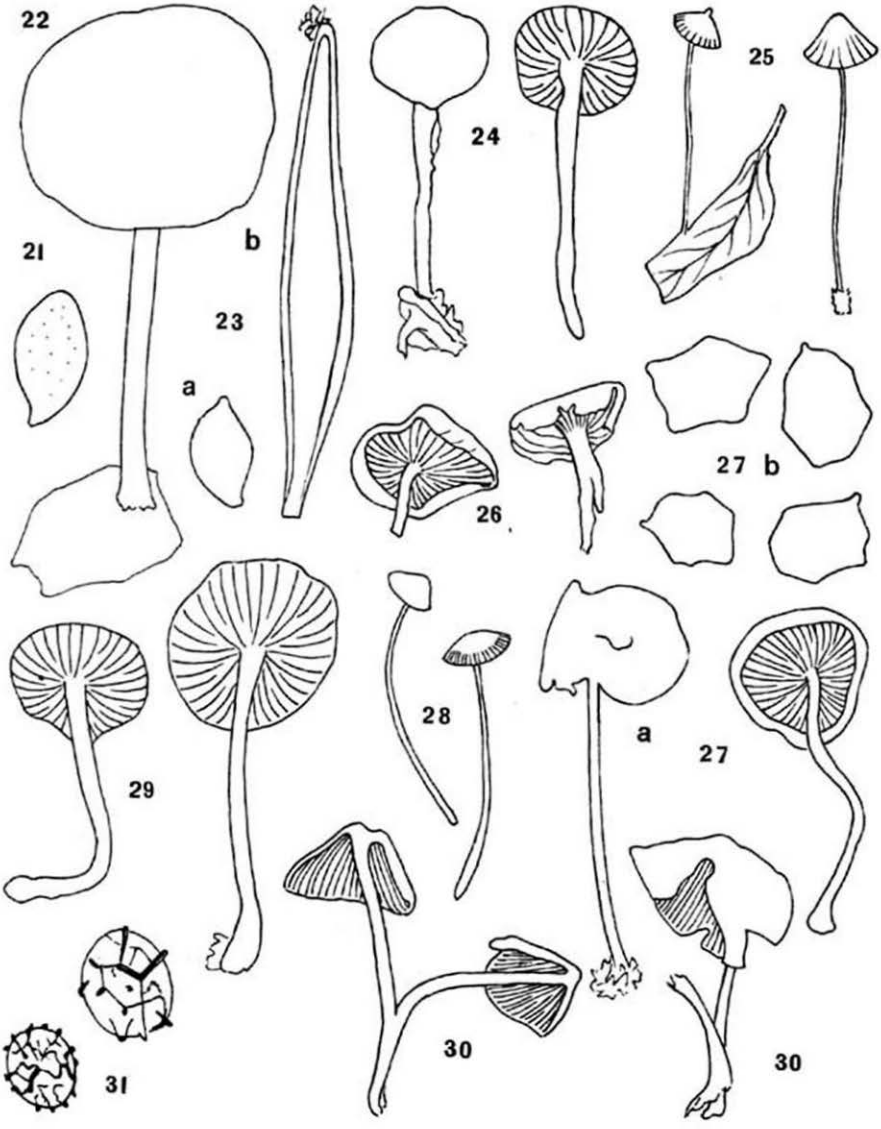
EXPLANATION OF FIGURES 21–31

Figs. 21–31. — 21. *Agaricus mesophaeus* Pers. Spore. — 22. *Agaricus pascuus* Pers. ex Fr. Carpophore. — 23. *Agaricus phaeocomis* Pers. a. Spore. b. Metuloid. — 24. *Agaricus phaeophthalmus* Pers. Carpophores. — 25. *Agaricus phyllogenus* Pers. Carpophores. — 26. *Agaricus phyllophilus* Pers. Carpophores. — 27. *Agaricus politus* Pers. ex Fr. a. Carpophores. b. Spores. — 28. *Agaricus pumilus* Pers. ex Fr. Carpophores. — 29. *Agaricus pyriodorus* Pers. ex Fr. Carpophores. — 30. *Agaricus stipatus* Pers. ex Fr. Carpophores. — 31. *Agaricus subdulcis* Pers. ex Fr. Spores in Melzer reagent.



Figs. 21–31

8–9.2 × 4.8–5.8 μ, smooth, ellipsoid-amygdaliform, brownish; metuloids numerous, 60–78 × ± 10 μ, fusoid, hyaline, often pale brownish near edge of lamellae, thick-walled (wall about 3.8 μ thick). — Illustration: Fig. 23.

This is a species of *Inocybe*, belonging in the *Obscura* group. It must be left to the specialists of the group to determine whether a transfer to *Inocybe* serves any useful purpose. Fries (*in* Linnaea **5**: 720. 1830) thought of *Inocybe lanuginosa* which is incorrect.

AGARICUS PHAEOPHTHALMUS Pers., Mycol. eur. **3**: 72. 1828.

The type (L 910.261–124) is preserved; it comes from France.

Spores few preserved, small, 3.5–5.8 × (1.3 –)2–2.5 μ, smooth, hyaline, inamyloid, basidia 14–19 × 4.3–5.8 μ. Hymenophoral trama regular, consisting of filamentous elements, inamyloid, with clamp connections. Epicutis of pileus with vesiculose elements. Habit that of a rather thin omphalioid *Clitocybe*. — Illustration: Fig. 24.

This is *Clitocybe hydrogramma* (Bull. ex Fr.) Kummer of which it is a synonym.

Fries (*in* Linnaea **5**: 706. 1830) likewise identified Persoon's species with *A. hydrogrammus*, half-expallent from, a very good guess. Fries also thought that *A. streptopus* Pers. is the same thing. Of this latter, type material is not preserved.

AGARICUS PHYLLOGENUS Pers., Mycol. eur. **3**: 242. 1828.

The type (L 910.256–1733) comes from France. It is well preserved.

Spores 5.7–9.2 × 3.5–5 μ, hyaline, smooth, oblong or ellipsoid, amyloid; basidia 21–23 × 5–7 μ, mostly 4-spored; cheilocystidia 17–20 × 7–10.5 μ, clavate, hyaline, 'en brosse' in upper portion. Hymenophoral trama regular, strongly amyloid, consisting of broad elements. Epicutis hyphous, hyphae appressed, 'en brosse'. The pileus is conic to conic obtuse, up to 13 mm broad now, the stipe filiform and apparently glabrous with mycelioid base which is attached to oak leaves. — Illustration: Fig. 25.

This, in the monograph of Kühner, appears as *Mycena vitrea* var. *tenella* Kühner and in Kühner & Romagnesi (1953) as *Mycena iodiolens* var. *tenella*. It appears that these names have to be replaced by Persoon's which is not only older but better established because of the specimens. The combination **Mycena phyllogena** (Pers.) Sing., *comb. nov.*, is therefore proposed. *Agaricus vitreus* Fr. is quite ambiguous.

AGARICUS PHYLLOPHILUS Pers., Syn. 457. 1801 *ex* Fr., Syst. mycol. **1**: 83. 1821.

The specimen preserved here (L 910.261–131) is not the type although apparently determined in Persoon's handwriting. It is in contradiction with the original diagnosis where Persoon states that "the pileus is 2 unc. broad". The specimens have now a diameter of 15–19 mm.

Spores 6–6.3 × 3.5–3.6 μ, hyaline, smooth, inamyloid; basidia 19–24 × 5.5–6 μ, 4-spored. Clamp connections seen. The lamellae are close and decurrent, and the stipe is now 3 mm broad above, 1.5 mm below. — Illustration: Fig. 26.

The analyzed material is not the *A. phyllophilus* Pers. ex Fr. which, in both the

case of Persoon as that of Fries seems to be identical with the species described under this same by Kühner & Romagnesi (1953), i.e. the species with the flesh-cream spore print. The specimen is a species difficult to place, inasmuch as the hygrophanity of the pileus and the odor of the context are unknown.

AGARICUS PLICATUS Pers., Disp. meth. Fung. 62. 1797 *ex* S. F. Gray, Nat. Arr. Brit. Pl. **1**: 634. 1821 (as *Coprinus*), *non* Pers., Mycol. eur. **3**: 78. 1828.

The authentic specimen preserved (L 910.256–1722) was collected in Germany by Junghuhn. It is the same as *Coprinus atramentarius* (Bull. ex Fr.) Fr. and becomes a synonym of that species.

AGARICUS PLICATUS Pers., Mycol. eur. **3**: 78. 1828.

The type (L 910.256–1732) was not studied since it is obviously a homonym.

AGARICUS POLITUS Pers., Syn. 465. 1801 *ex* Fr., Syst. mycol. **1**: 209. 1821.

The type (or authentic) material (L 910.255–345) is in good condition. It is not in contradiction with Fries 1821 but should not be recognized as lectotypical (see below).

Spores 7–10.3 × 5.8–8.5 μ, mostly hexagonal, symmetric in the sense of Romagnesi, stramineous. Carpophores almost 'collybioid'. — Illustration: Fig. 27.

This is apparently the same species as generally recognized as *Rhodophyllus politus* by modern authors; however, it is the beech form, not the bog form, and it is the latter which is the one described by Fries (1821). This is important because some modern specialists may not agree with Fries who made both forms conspecific in his later work. Kühner & Romagnesi have the bog-form.

AGARICUS POLYMYCES Pers., Disp. meth. Fung. 19. 1797 *ex* S. F. Gray, Nat. Arr. Brit. Pl. **1**: 663. 1821 (as *Lepiota*).

There are numerous collections, all authentic, one might be the lectotype but we have designated none because the question is of no importance as long as only one species in the *Armillariella mellea* group is recognized in western Europe. When a revision of the stirps according to principles discussed in Lloydia **19**: 176–178, 1956 will be forthcoming, the monographer should make the choice of a lectotype since there is a possibility that the binomial *A. polymyces* might be needed in addition to *A. mellea*.

AGARICUS PRAECOX Pers., Syn. 420. 1801 *ex* Fr., Syst. mycol. **1**: 282. 1821.

The only specimen which was found under this name may be authentic or even possibly the type. It should be recognized as the type of the species by lecto-type designation since there are no contradictions between its characters, the characters indicated in the original diagnosis, and the concept of the species as published by Fries in 1821. This specimen is L 910.261–732.

Spores 8–11 × 5.7–7 μ, mostly 8.5–10 × 6–6.5 μ, smooth, melleous, with distinct apical germ pore. Cystidia 23 × 15 μ. Macroscopically as described.

This is *Agrocybe praecox* (Pers. ex Fr.) Fayod as now interpreted by all modern authors.

AGARICUS PROBOSCIDEUS Fr., Obs. mycol. **2**: 232. 1818 *ex* Fr., Syst. mycol. **1**: 274. 1821.

There is one specimen in the Herbarium Persoon which is labeled "*Agaricus proboscideus* Fr. E Norwegia misit. Habitat ad truncos *Alni*."

The material is not part of the type. It was not collected on pine wood in mines as was the type seen by Fries. Nevertheless since the label might implicitely suggest that the specimen has been sent by its author (Norway was at that time part of Sweden), it is not a priori impossible that this is authentic material for the Friesian species. This is possible also because of the circumstance that Fries who in 1821 thought that "since it occurs only in underground passages, it seems of the nature of a monstrosity", describes it in 1838 as growing "on wood and branches" and adds "*Sommerf. Lapp. p.* 261!". Sommerfelt worked in northern Norway and published in 1826, so it may be that the material comes from his collections and as it were emphatically recognized by Fries, his material may be considered authentic for Fries's species for that reason.

This material is in external appearance and microscopical and microchemical characters identical with *Tectella patellaris* (Fr.) Murrill, a species described many years after the first and revalidating descriptions of *A. proboscideus* Fr.

The circumstantial evidence for considering this material as authentic is, in my opinion, not strong enough to transfer *A. proboscideus* to *Tectella*, or to consider *A. patellaris* a later synonym of *A. proboscideus*. Nevertheless, *A. proboscideus* has puzzled agaricologists for over a century and a half, and any data that might eventually help to untangle this puzzle seemed relevant enough to come to the knowledge of all mycologists.

AGARICUS PROPINQUUS var. SPADICEUS Pers., Mycol. eur. **3**: 63. 1828.

The type of the variety (L 910.255–347) has spores 5–5.5 × 2.5–3.8 –, smooth, basidia about 3.5 μ broad, cystidia, none, hyphae with clamp connections. This together with the data of the diagnosis and the external appearance of the carpophore seem to indicate that it is *Clitocybe alexandri* (Gillet) Konrad. Unfortunately, we do not know whether the type variety also belongs here so that we can only say that *C. alexandri* was indeed first collected and described not by Gillet but by Persoon.

AGARICUS PULVINATUS Pers., Mycol. eur. **3**: 44. 1828.

The specimen under this name (L 910.255–251) has nothing to do with this species and the specimen must have been determined by some one else (label not in Persoon's handwriting). This seems more like an attempt to determine exotic material. The carpophores preserved are an assemblage of a *Melanotus* sp. and a *Stereum* sp.

AGARICUS PUMILUS Pers., Syn. 317. 1801 *ex* Fr., Syst. mycol. **1**: 263. 1821.

L 910. 255–854 is the only specimen of *A. pumilus* Pers. in the Herbarium. It corresponds well with the original (Persoon) and the revalidation (Fries) diagnosis. It is, by a *lapsus pennae*, labeled "*A. pumilus* Schaeffer" but this means '*A. pumilus* Pers. = *pusillus* Schaeff.' It may well be taken as the type, but is at least authentic and eligible as lectotype.

Spores 11–11.5 × 5.5–6 μ, ellipsoid to amygdaliform, melleous to brownish ochraceous, well pigmented but completely smooth in KOH, NH_4OH and the Melzer reagent, without a suprahilar plage; basidia 21–23 × 5.5–7.5 μ, almost all 4-spored, very few 2-spored, hyaline; cystidia, none; cheilocystidia 30–50 × 1.7–7 μ, filamentous with or without a thickened base (if thickened, base 4–7 μ across), otherwise 1.7–3 μ thick except for a swelling at the apex which makes the cells subcapitate (2.5–4.7 μ diameter) but which may rarely and occasionally be missing, hyaline to pale ochraceous. Hymenophoral trama pale stramineous, regular. Epicutis not gelatinized, its hyphae repent and filamentous with or without an ochraceous pigment incrustation, thin-filamentous; hypodermium of broader hyphae which are more strongly incrusted by rusty brown pigment, all forming a cutis, some superficial hyphal endings occasionally forming almost cystidioid tips, but typical dermatocystidia not observed. All hyphae with clamp connections. The stipe is without a trace of an annulus or annular belt and was probably covered with appressed silky threads, the stipe itself thin, filiform, with a moss thallus still preserved at the base of one specimen (not *Sphagnum*). — Illustration: Fig. 28.

This material is the same as that described by Kühner in his Galera monograph as *Galerina mycenopsis*. The name **Galerina pumila** (Pers. ex Fr.) Sing., *comb. nov.*, is proposed. This change in the name of one of the species of *Galerina* should be welcome rather than inconvenient inasmuch as Kühner (l.c., p. 190) cites only "(Ricken)", not (Fr. ex Fr.), because, as he explains, "L'espèce de Fries paraît différente de celle de Ricken et les remarques faites par Fries (*Monographia*) à propos de *G. mycenopsis* (décrit par suite d'une erreur d'impression sous le nom de *G. mycenoïdes*), laissent supposer que l'auteur ne concevait pas très clairement les limites de son espèce."

Bas (*in* Persoonia **1**: 303. 1960) expresses the opinion that *Agaricus pumilus* Pers. should be placed in *Agrocybe* but this was written before the type of *Agaricus pumilus* Pers. was discovered. As Bas states correctly, Fries changed his mind in regard to *A. pumilus* in Elench. **1**: 29. 1828 where he describes an annulate species which is most probably the same as the one described by Bas (l.c., p. 304) which belongs in the stirps *Marginata* of *Galerina*.

AGARICUS PURPUROPUS Pers., Mycol. eur. **3**: 110. 1828.

The type (L 910.255–170) is preserved.

Spores angular, 8.5–9.3 × 6.3–8 μ. The hymenium is destroyed. This is a *Rhodophyllus* with a slightly umbilicate pileus glabrous and now rather dark but said to be whitish; lamellae close, adnate. I cannot determine this specimen any further.

AGARICUS PYRIODORUS Pers., Syn. 300. 1801 *ex* Fr., Syst. mycol. **1**: 255. 1821.

The specimen preserved (L 910.255–185) is the only specimen of this name in the Persoon Herbarium; it may be the type but is most certainly authentic and should be acceptable as lectotype for *A. pyriodorus* Pers. ex Fr. inasmuch as there is no discrepancy between Persoon's and Fries's concept. The specimen is well preserved.

Spores smooth, amygdaliform, 9.2–10.8 × (3.5 –)5–5.8 μ, brownish, without germ pore. Metuloids 60–63 × 10.3–16 μ, fusoid, muricate with crystalline incrustation, moderately numerous on sides and edges of lamellae, with very thick (3.8 μ diameter) hyaline wall. The lamellae are finely crenulate. — Illustration: Fig. 29.

This is the *Inocybe pyriodora* (Pers. ex Fr.) Kummer of modern authors.

AGARICUS QUISQUILIARIS Pers., Mycol. eur. **3**: 258. 1828.

The type (L 910.255–199) represents a small *Mycena* in the narrowest sense, section *Filipedes*. The spores are 7.5 × 4–4.7 μ; both spores and trama are distinctly amyloid.

A more precise determination might be attempted by a specialist of the genus. This would be desirable also because in *Mycena* already exists a *Mycena quisquiliaris* (Josserand) Kühner.

Fries, by merely reading the diagnosis, came to the same conclusion (*in* Linnaea **5**: 729–730. 1830): "Pertinet ad formas *Mycenarum* locis udis umbrosis gracilescentes; a simili *A. galericulata* mihi obvia vix recedit".

AGARICUS RACEMOSUS Pers., Disp. meth. Fung. 15. 1797 *ex* Fr., Syst. mycol. **1**: 134. 1821.

Type or authentic material has been studied (L 910.255–200). This is undoubtedly the same as the modern concept of *Collybia racemosa* (Pers. ex Fr.) Quél.

AGARICUS RADICATUS var. PUDENS Pers., Syn. 313. 1801 *ex* S. F. Gray, Nat. Arr. Br. Pl. 1: 605. 1821 (as *Gymnopus pudens*).

The type or authentic material (L 910.255–278) is in good condition and can easily be determined as *Oudemansiella longipes* (Bull. ex St-Amans) Moser, or *Xerula longipes* (Bull. ex St-Amans) Maire. Since St.-Amans revalidated *A. radicatus* var. *pudens* as species a few months earlier than S. F. Gray revalidated *G. pudens* the Friesian epithet may be restituted.

AGARICUS RHIZOGEUS Pers., Mycol. eur. **3**: 249. 1828.

The specimen studied (L 910.255–329) is one of two which were determined *A. rhizogeus*, but they are somewhat deteriorated. A third collection had the original determination crossed out and replaced by *A. rhizogeus*. The specimen studied is undoubtedly authentic but so are the others.

This has white lamellae, radicant stipe fibrillose at base, slightly striate otherwise.

The spores are about medium sized, mostly collapsed; epicutis not gelatinized, trama and spores amyloid.

This is a *Mycena* in the narrowest sense, perhaps *M. parabolica* in the sense of J. E. Lange, or aff. *M. filopes* sensu Kühner.

It is possible that a specialist of the genus, studying all three collections, can determine the species more precisely. Fries (*in* Linnaea **5**: 728. 1830) says that this is patently *A. plexipes* Fr. but that species is now interpreted as a *Lyophyllum*.

AGARICUS ROMALEUS Let. *ex* Fr., Hym. eur. 318. 1874.

The specimen (L 910.262–217) is the type or part of the type. It is in agreement with Letellier's figure.

Spores 5.2(– 7) μ diameter, globose; basidia 20–28 × 5.7–7.5 μ; cystidia, none. Hyphae hyaline, filamentous, with clamp connections.

This is *Lyophyllum fumosum* (Pers. ex Fr.) Orton. It will be added to the already impressively long list of synonyms of that species.

AGARICUS RUBESCENS Pers., Disp. meth. Fung. 67. 1797 (as *Amanita*) *ex* Fr., Syst. mycol. **1**: 18. 1821.

The only specimen in existence in the Persoon Herbarium, L 910.262–227, is not the type, but authentic and characteristic. It is labeled "*Amanita rubescens* Pers. *Agaricus verrucosus* B. specimen exiguum". It should be acceptable as lectotype.

This is the species now called *Amanita rubescens* Pers. ex (Fr.) S. F. Gray.

AGARICUS RUBIGINOSUS Pers., Syn. 385. 1801 *ex* Secr., Mycogr. suisse **2**: 377. 1833.

The only authentic specimen that agrees well with the original description (L 910.262–220) was studied.

It has deep fuliginous spores 11.5 × 7 μ, with distinct germ pore and is undoubtedly a coprinaceous species.

Another specimen, leg. Chaillet (?) does not agree with the type description since it has too large carpophores.

These data should be sufficient to eliminate *A. rubiginosus* Pers. from the species entering the genus *Galerina* inasmuch as Secretan, the revalidating author (not Fries 1836 as stated by Orton) has again another species, neither coprinaceous nor a *Galerina* but most probably a *Cortinarius!*

Persoon himself gave the species up in 1828 considering it a synonym or a form of *Agaricus hypnorum*. Fries (1838) thought to have rediscovered Persoon's species ("vix Secr.") and gives an illustration in Icon. sel. pl. 128 fig. 3 but this is a var. *maior* which according to Kühner "ne ressemble guère à notre *G. rubiginosa*" [=*G. vittaeformis* (Fr.) Sing.].

AGARICUS SAGARUM Pers., Syn. 331. 1801 *ex* Secr., Mycogr. suisse **2**: 172. 1833.

The type of this species is Bulliard, Herb. pl. 585 fig. 2. Authentic material, i.e. material which was apparently accepted by Persoon as correctly determined, was

later added to his Herbarium from material collected by Chaillet (L 910.262–225). This is *Collybia confluens*.

As far as I am aware, Persoon's species has not been revalidated, except by Secretan whose species is doubtful and does not fully agree with either *C. confluens* or *C. hariolorum* sensu Favre, but was given as a synonym of *A. hariolorum* by Fries (1874). Persoon himself (1828) gave up *A. sagarum* and thought that *A. hariolorum* Bull. was perhaps the same as *A. archyropus*, i.e. *C. confluens*. If we take Persoon's concept up against Secretan's, *A. sagarum* becomes a synonym of *C. confluens;* if we take up Secretan's concept, as I would prefer to do, the species must be regarded as a nomen dubium until and unless it will be cleared up in the future.

AGARICUS SCHAEFFERI Pers., Obs. mycol. **2**: 55. 1799.

There is an authentic specimen for both *A. schaefferi* Pers. and *A. alliatus* Pers. (L 910.256–1724) "Ex Norvegia". Since both names appear as synonyms of *Agaricus scorodonius* Fr. ex Fr. *in* Syst. mycol. **1**: 130. 1821, this authentic specimen may serve as additional proof that *A. scorodonius* is actually the species now generally called *Marasmius scorodonius* (Fr. ex Fr.) Fr., for the specimen cited is demonstrably that species in the modern sense.

AGARICUS SCOBIGENA Pers., Mycol. eur. **3**: 23. 1828 (as *A. scobigeria*, a misprint, recte: *scobigenus!*).

The type is L 910.256–1718. It was collected by Delastre, "sur la Poussière de bois scié du Pin Maritime. Poitou. Environs d. Chât[ellerault].

Spores 5–5.8 × 3.5–4 μ, smooth, now few pseudoamyloid, most inamyloid, melleous, ellipsoid. Hymenophoral trama still distinctly bilateral.

The spores are now (1960) almost all inamyloid but there are a few transitional stages conserved which show the mechanism by which the pseudoamyloidity becomes lost. The pseudoamyloid reaction is apparently particularly localized in the outermost layer of the spore which in very old material disintegrates, and in some spores this layer is still seen flaking off leaving irregular plage-like zones; where the outermost layer remained intact, the pseudoamyloid reaction can still be seen. This is a synonym of *Paxillus panuoides* (Fr. ex Fr.) Fr. (see also *Agaricus bubalinus* Pers.). Fries (*in* Linnaea **5**: 702. 1830) likewise determined it thus.

AGARICUS SEBACEUS Pers., Mycol. eur. **3**: 188. 1828.

The type (L 910.262–223) is well preserved. The spores are (3–)3.5–4.7(– 5.2) × 1.8–2.5 μ, smooth, ellipsoid, hyaline; basidia 12.5–17.5 × 3.5–4 μ. Lamellae short-decurrent, crowded, narrow; margin of pileus incurved.

I determine this specimen as *Clitocybe diatreta* (Fr. ex Fr.) Kummer; there is no doubt in my mind as to the identity of this material with collections of mine in Europe and Asia. The species is here interpreted in the sense of J. E. Lange. Fries thought this is *A. subalutaceus* Batsch ex Fr. But that species, is now variously interpreted, and, in the sense of Ricken, has subglobose spores, in the sense of Lange

it has larger spores, and in both senses, the lamellae are much less crowded than in *A. sebaceus* Pers.

AGARICUS SEPINCOLA Pers., Mycol. eur. **3**: 120. 1828.

The specimen now preserved under this name does not coincide. This is a *Inocybe* sp. with macroscopical characters quite different from those of the type diagnosis. There must have been a confusion of specimens and sheets.

AGARICUS STILBOPUS Pers., Mycol. eur. **3**: 219. 1828.

Not one of the two sheets preserved under this name can be the type since one is too small, one too large, as compared with the type diagnosis, and both have lamellae which could not possibly have been described as black. Both are *Cortinarius* sp., different from each other.

AGARICUS STIPATUS Pers. var. *a*, Syn. 423. 1801 *ex* Fr., Syst. mycol. **1**: 296. 1821.

This (L 910.262–248) may be considered typical along with another collection. L 910.262–248 is labeled "*Agaricus* affinis *appendiculato*" and "*A. stipatus a*".

The spores are (4.5 –)6–7.3(– 8) × (3 –)3.5–4.5(– 5.2) *μ*, smooth, with a broad germ pore, ellipsoid to oblong, dull brown, not particularly pale in ammonia, more fuscous after a while, rather fuliginous although very transparent in KOH; basidia 12.5–17.5 × 4.5–5.8 *μ*, cystidia on the sides of the lamellae, none (unless completely collapsed, not one observed with certainty (some doubtful, of type of cheilocystidia); cheilocystidia 16–40 × (5 –) 8–18 *μ*, conspicuous, making the edge of the lamellae heteromorphous, hyaline, with thin walls, or nearly so, not muricate, 'utriform', i.e. broadly bottle-shaped-ventricose, broadly and short and obtusely mucronate above or vesiculose or clavate or with a constriction in the middle, numerous and well preserved. Hymenophoral trama hyaline or subhyaline. — Illustration: Fig. 30.

I determine this *Psathyrella candolleana* (Fr.) Maire, but with some hesitation. Kühner & Romagnesi (Flore anal. 368. 1953) say that *P. candolleana* is a "espèce collective, d'où l'on isolera sans doute de nombreuses variétés, mais qu'il est encore trop tôt pour tenter de subdiviser". Once such a subdivision takes place, it is possible that the epithet 'stipatus' will again be used.

In another collection, we find the spores slightly smaller. The carpophores developed apparently on all kinds of débris. This is probably identical with the other collection. A third collection came from Germany and was collected by Junghuhn, apparently mainly on earth, with spores as in the previously mentioned collection. Junghuhn's collection, of course cannot be the type.

In Fries's later works *A. stipatus* becomes *A. appendiculatus* Bull. ex St-Amans a species which, according to Dennis, Orton & Hora (1960) if taken in the sense of the revalidating author, as well as in the sense of Bresadola and Rea, is likewise *P. candolleana*.

Thus, our conclusion is that *A. stipatus* = *A. appendiculatus* = *A. candolleanus*.

AGARICUS STYLOBATES Pers., Syn. 390. 1801 *ex* Fr., Syst. mycol. **1**: 153. 1821.

The type or more probably merely authentic material preserved (L 910.256–1766) comes from Verrières, in the surroundings of Paris. Its pileus is about 8 mm broad. A sulcate basal disc, still very distinct, forms some sort of a socle.

It is the *Mycena stylobates* (Pers. ex Fr.) Kummer in the sense of Kühner and Kühner & Romagnesi.

AGARICUS SUAVIS Pers., Abh. essb. Schw. 155. 1822.

The type (L 910.262–160) is the same as *Agaricus gibbus* Pers. ex Fr. = *A. flaccidus* Sow. ex Fr. (1821, *non post.*) = *A. infundibuliformis* Schaeff. ex Fr. (Elench. 12, as alternative name, *et op. ult.*). It is therefore a further synonym of *Clitocybe gibba* (Pers. ex Fr.) Kummer.

We found the spores of the type smooth, hyaline, 4.8–7 × 2.3–3.5 μ; basidia 21 × 4 μ. The carpophore is rather large.

There is also a second specimen under the name of *A. suavis* Pers. which refers to a somewhat smaller form described under *A. suavis* Pers. in "Mycologia europaea" **3**: 59. 1828. I have not studied it. Even if it were different, it would be a later homonym of *A. suavis* Pers. 1822. However, Fries (1830) thinks it is also *A. gibbus*.

AGARICUS SUBDULCIS Pers., Syn. 433. 1801 *ex* Fr., Syst. mycol. **1**: 70. 1821.

There is only one collection (L 910.262–155) which is labeled *A. subdulcis*, and this seems to be representative of the type form as described by Persoon; there are also no contradictions with *A. subdulcis* Pers. ex Fr. as described in the revalidating diagnosis. Therefore the present specimen is taken as a lectotype of the species It does not have a long stipe (which would exclude the type variety) but on the contrary refers to the synonym of the type variety. Pileus and lamellae are well preserved.

Spores 7.3–9.3 × 6–8.5 μ, with low (0.3–0.6 μ) ornamentation of type II (complete network, or almost complete reticulation of crowded seriate wrats and lines and thicker crests) or, *more often* of type II–IIIb (II–IV, IV, VIII), the thinner lines at their crossings mostly nodose-thickened, thick lines never by themselves forming a complete or even nearly complete network. Macrocystidia definitely present. Epicutis hyphous, no spherocysts visible in a scalp preparation (or only vaguely in few places). — Illustration: Fig. 31.

This is in every respect identical with the *Lactarius subdulcis* (Pers. ex Fr.) Fr. as described and illustrated by Neuhoff, who in turn thinks that his species is the same as Ricken's concept of the species; Romagnesi (*in* Bull. Soc. mycol. Fr. **54**: 224. 1938) and Neuhoff 1941 are also cited. In reality, this form was seen by me in Austria, Wiener Wald, but not, at that time, clearly separated from similar species.

The spores as here described and illustrated are *not* characteristic for the *L. subdulcis* in the sense of Kühner & Romagnesi. A careful comparison with the latter shows that indeed we have two different species here, and that the type and thus

the genuine *L. subdulcis* can be distinguished from the species of Kühner & Romagnesi at a glance by the spore ornamentation which is much more isolated in the species as characterized by the French authors (Flore anal. 480. 1953) where we read "Sp. 8–10 × 5.5–7.5 μ, grenelées-verruqueuses, a verrues ça et là réunies en réseau". This is the species which I have taken as *L. subdulcis* sensu Kühn. & Rom., Romagnesi, J. E. Lange and with which I am fairly well familiar from both fresh and herbarium material, also material recently revised and found to be in complete agreement with the description by Kühner & Romagnesi, Romagnesi, and with a species described recently from Czechoslovakia. This latter, *Lactarius hradecensis* Z. Schaefer (*in* Česká Mykologie **2**: 85. 1948), is the valid name for *Lactarius subdulcis* sensu Kühner & Romagnesi. A comparison between the spores of *L. subdulcis* (our fig. 31) and *L. hradecensis* (l.c., p. 84) will make the difference clear enough.

AGARICUS SUBOPACUS Pers., Mycol. eur. **3**: 102. 1828 (*ex errore*, cf. *Errata corr.* p. 283), see *A. opacus*.

AGARICUS TABULARIS Pers., Mycol. eur. **3**: 73. 1828.

The type of this species (L 910.256–1765) as well as the type or authentic material referring to *Agaricus opacus* Pers. (L 910.262–165 and L 910.262–1765) are preserved and in good condition.

The spores are smooth, hyaline, inamyloid, ellipsoid, (3–)3.7–5 × (1.7–)2.3–2.8 μ; basidia 14–15 × 3.5–4.5 μ. Hyphae of the trama of the lamellae rather loose, filamentous, hyaline, inamyloid. The pileus in glabrous, medium sized, flat, apparently white; lamellae crowded, adnate-subdecurrent; stipe moderately long, glabrous, leaves of frondose trees attached to the basal portion of it (*Quercus*). The type of *A. tabularis* came from the Bois de Boulogne at Paris where it may grow until today. The specimens of *A. opacus* respectively *A. subopacus* agree with those of *A. tabularis* in every particular. This probably came from the Bois de Vincennes.

This species, because of the stypic or acidulous taste, may be compared with *A. gallinaceus* which, however, in the sense of some authors is the same as *C. hydrogramma* which has different macroscopical and microscopical characters, and in the sense of others is a smaller and thinner species with larger spores.

This is quite similar to the species I knew as *C. pityophila* but differs in the habitat on oak leaves. It is certainly not *C. phyllophila* because the lamellae are too crowded. This leads to the conclusion that there is a leaf-inhabiting form or race of *C. pithyophila*. This seems to corroborate that Fries indicates his *A. cerussatus* (which, according to descriptions is hardly much different from *A. pithyophilus*) as growing in both coniferous and frondose woods, and would invalidate my suspicion that *C. cerussata* sensu Ricken was the same as *Clitocybe alba* (Bat.) Sing. This suspicion originated with my failure to collect a form corresponding to the characters of *A. cerussatus* in frondose woods. Kühner & Romagnesi have not collected it either. And it seems that Ricken did likewise ignore this form since the larger spores would corroborate the correctness of my original interpretation.

In consequence of these facts, my determination of the specimens of the Persoon Herbarium here discussed is *Clitocybe cerussata* (Fr.) Gillet (with priority over the Persoonian species), leaf-inhabiting form or race.

Strangely enough, Fries (Hym. eur. 74. 1874) identifies *A. tabularis* Pers. with *A. grammopodius*, a species of *Melanoleuca*, but (l.c., p. 93), *A. opacus*, *A. subopacus* and *A. cretaceus* Pers. with his *A. opacus* "With." which is "maxime affinis *A. cerussato*, cui *olim subjunxi* et a quo *aliorum suaso* tantum nunc separo." Except for the obvious error regarding *A. tabularis*, this indicates that our determination of *A. opacus-A. subopacus* coincides with that of Fries. *A. opacus* Fr. is put in synonymy of *Clitocybe tornata* (Fr.) Kummer by Dennis, Orton & Hora (1960), evidently in the sense of Ricken, Moser in Gams, but one fails to see that this species with its crowded ("sehr gedrängt") lamellae could be the Friesian species *A. tornatus*, and, if it were, how it would differ from *A. cerussatus* Fr. On the contrary, it seems quite logical that Ricken who misinterpreted *A. cerussatus* (for *C. alba*), needed a name for the true *A. cerussatus*, and thought to have found it in *A. tornatus*.

AGARICUS TARDUS Pers., Syn. 461. 1801 *ex* Mycol. eur. **3**: 80. 1828.

The type (L 910.262–158) is indeed the same as *Pseudoclitocybe cyathiformis* (Bull. ex Fr.) Sing. Fries 1821 cites *A. tardus* Pers., Syn., for *A. cyathiformis* so that the specimen in the Persoon Herbarium serves not only to prove the identity of *A. tardus* Pers. but serves to establish the concept of *A. cyathiformis* in the revalidating description (Fries, Syst. mycol. **1**: 173), already rather well understood because of the illustrations quoted, especially the type plates (Bulliard pl. 575, pl. 568 fig. 1). To round out the picture, Fries (*in* Linnaea **5**: 707. 1830) identifies *A. tardus*, Mycol. eur., l.c., with his *A. cyathiformis*.

AGARICUS TRICHOTIS Pers., Mycol. eur. **3**: 18. 1828.

This is the type (L 910.256–1763) and evidently precisely the specimens from which the figures (l.c., pl. 26 fig. 9) were made.

It is in good condition; 3 carpophores, collected near Paris, France. The pileus is black with black pilose covering. Spores about 5.3 × 4.5 μ, smooth, hyaline; basidia 14–16 × 3.5–4.5 μ. Hyphae in trama of lamellae strongly gelatinized, 1–2.3 μ broad, filiform, with numerous clamp connections.

This is unmistakably **Resupinatus trichotis** (Pers.) Sing., *comb. nov.* = *Resupinatus rhacodium* (Berk. & Curt.) Sing., the latter now being reduced to synonymy of the former.

Fries thought that Persoon's species was the same as *Agaricus applicatus* which seems a good guess for anyone who is not familar with this closely related species (cf. *in* Linnaea **5**: 701–702. 1830). Later (1874) Fries indicates another *A. trichotis* "Trog 1824" which is said to be a synonym of *A. pezizoides* Fr. This would make *A. trichotis* Pers. a later homonym of *A. trichotis* Trog. However, Fries' citation is erroneous since a careful review of the literature shows that Trog did not publish an *Agaricus trichotis* previous to Persoon.

AGARICUS VELUTINUS Pers., Syn. 409. 1801 *ex* Fr., Syst. mycol. **1**: 288. 1821 (as *A. lacrymabundus β. velutinus*).

The material L 910.262–151 is either authentic or type material and should at any rate be considered lectotypical for *A. lacrymabundus* var. *velutinus* (Pers. ex) Fr. It is in good condition and labeled:

"*Agaricus velutinus* Pers. Syn. fung.
"——— *lacrymabundus* Bull."

Three young specimens, fasciculate, and one older specimen are represented on the sheet. The spores are fuliginous-sepia, strongly verrucose, 9–11.5 × 7–7.7 μ. The color of the pileus is described "ferruginous", cap apparently coarsely fibrillose, and umbonate according to description. But the specimens are rather fleshy and thick.

This is what modern authors call *Psathyrella velutina* (Pers. ex Fr.) Sing. It is interesting because this species is the type species of the genus *Lacrymaria* Pat., and *Psathyrella* subgen. *Lacrimaria* (Pat.) Sing. In the sense of Kummer, it has also been designated (selected) as lectotype of the genus *Hypholoma* Kummer but the data given by Kummer are insufficient to state whether his *A. velutinus* coincides with the *A. velutinus* of Persoon and Fries. Moreover, it can hardly coincide with the generic description which is the sum of characters indicated in the key leading up to "*Hypholoma*" in Kummer (not only the last stage) and adding these characters one will find that there is hardly an agaric which combines these characters. We therefore consider *Hypholoma* an untenable genus, based on a nomen dubium.

AGARICUS VIOLACEOCINEREUS Pers., Syn. 279. 1801 *ex* Fr., Syst. mycol. **1**: 217. 1821.

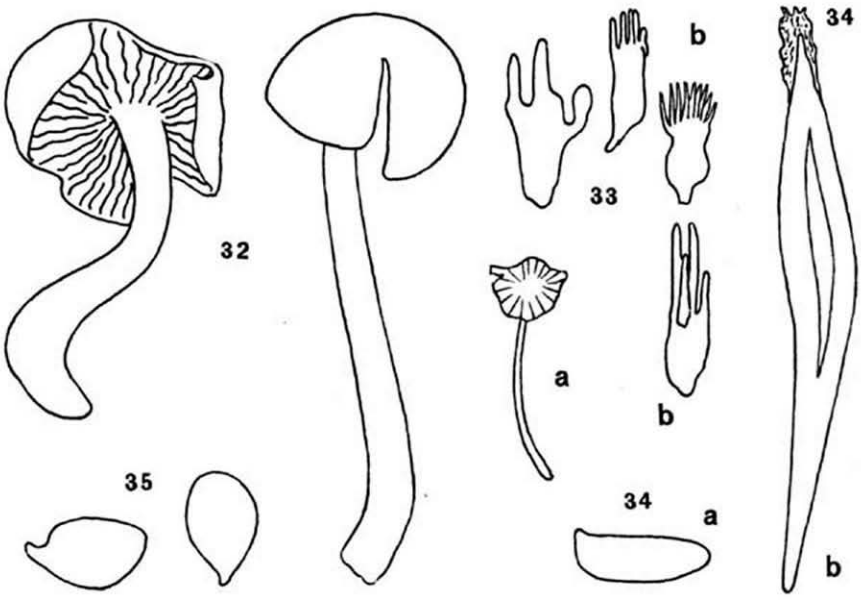
The type or authentic specimen preserved in the Persoon Herbarium is L 910.262–203 which is in good condition. It should be accepted as lectotype of the species.

The color is now almost uniformly spadiceous except for the lamellae which are deep rusty; the characters of the surface of the pileus (glabrous?, viscid?) are not visible now. The lamellae are broad, moderately crowded. Spores numerous, rough, rusty-melleous, 11–14.5 × 7–8 μ, mostly 12.5 × 7–7.3 μ. — Illustration: Fig. 32.

It is hoped that these data may help identify the true *Cortinarius violaceocinereus* (Pers. ex Fr.) Fr. In "Hymenomycetes europaei" (p. 361, 1874) Fries reversed the name of Persoon to read *C. cinereoviolaceus* but still kept quoting Persoon and "Systema mycologicum". Therefore, the Persoonian name and its revalidation remain the basionyms of *C. cinereoviolaceus* also and the latter has the same type specimen. It is not permissible to have two autonomous species based on different types, one on *C. violaceocinereus* and the other *C. cinereoviolaceus*.

AGARICUS VITELLICOLOR Pers., Mycol. eur. **3**: 93. 1828.

The specimen preserved, probably the type, L 910.262–201, is well preserved. I believe this to be *Hygrophorus hypothejus* (Fr. ex Fr.) Fr.



Figs. 32–35. — 32. *Agaricus violaceocinereus* Pers. ex Fr. Carpophores. — 33. *Heliomyces berteroi* Lév. a. Carpophore. b. Broom cells of the pileus. — 34. *Merulius leucophaeus* Pers. a. Spore. b. Metuloid. — 35. *Merulius uliginosus* Pers. Spores.

AMANITA

Amanita aspera Pers.—See *Agaricus asper!*
Amanita rubescens Pers.—See *Agaricus rubescens!*

AMANITA VIRGATA Pers., Syn. 249. 1801 *ex* S. F. Gray, Nat. Arr. Br. Pl. **1**: 601. 1821 (as *Vaginata*).

The specimen preserved (L 910.262–210) is the same as the species now generally known as *Volvariella volvacea* (Bull. ex Fr.) Sing.

BOLETUS

BOLETUS BRACHYPORUS Pers., Mycol. eur. **2**: 128. 1825.

The type from Meudon, near Paris, has all characters of and is identical with *Gyrodon lividus* (Bull. ex Fr.) Sacc.

BOLETUS CASTANEUS Bull.; Pers., Syn. 509. 1801 *ex* Fr., Syst. mycol. **1**: 392. 1821.

The material preserved is not the type nor authentic. It is, however, the same species: *Gyroporus castaneus* (Bull. ex Fr.) Quél.

BOLETUS CONSTRICTUS Pers., Syn. 708. 1801 *ex* S. F. Gray, Nat. Arr. Brit. Pl. **1**: 647. 1821 (as *Leccinum*).

The material preserved bears the inscription "*Boletus cyanescens* B. / —— *constrictus* Pers. Syn. fung. (Fragmenta)". This is indeed the same as *Gyroporus cyanescens* (Bull. ex Fr.) Quél. Since *B. constrictus* Pers. appears as synonym in the revalidating diagnosis of *B. cyanescens* Bull. in Fries 1821, the specimen preserved at L serves as further indication as to the identity of *G. cyanescens* (Bull. ex Fr.) Quél.

BOLETUS RUBEOLARIUS Sow.; Pers., Syn. 512. 1801 *ex* S. F. Gray, Nat. Arr. Br. Pl. **1**: 648. 1821 (as *Leccinum*).

The material is not a type but might serve to identify the species indicated by S. F. Gray as "*Leccinum rubeolarium*" (Pers.) S. F. Gray. It was not analyzed by me.

BOLETUS SUBTOMENTOSUS L.; Pers., Syn. 506. 1801 *ex* Fr., Syst. mycol. **1**: 389. 1821.

The specimen of the Persoon Herbarium studied is typical for his description in "Synopsis". Since this is also indicated by the revalidating author, it may serve to make the latter's concept clearer, and might even be recommended as a lectotype. This is indeed typical *Xerocomus subtomentosus* (L. ex Fr.) Quél. in the sense of contemporaneous authors, including Singer.

HELIOMYCES

HELIOMYCES BERTEROI Lév. *in* Ann. Sci. nat. (Bot.) III **2**: 177. 1844.

The type (L 910.258–618) is deposited as "*Agaricus fulvus* Bertero ined." On the basis of this collection, Léveillé described his *Heliomyces berteroi*. The specimen here deposited is therefore either the type, or a syntype of *H. berteroi*. It is in good condition.

Pileus deep orange fulvous; lamellae distant; stipe glabrous, its base mycelioid. Spores (few now) 11.5–14.5 × 3.5–4.5 μ, smooth and hyaline, thin-walled, inamyloid. Cystidiole-like cystidia (perhaps transformed basidioles which have remained sterile) seen, 19–23 × 5.7 μ, but true *Marasmius*-cystidia, none. Edge of lamellae not studied. Trama distinctly pseudoamyloid. Epicutis of pileus a hymeniform layer of broom cells, marbled hyaline and deep golden melleous, the cells composing it varying in size from 6 × 6 μ to 15 × 5 μ (main body only), setulae erect, few ascendant, usually 4.5–8 × 1.2–1.5 μ but in the largest broom cells (which are scattered and rare although very striking and reach 24 μ in length) the setulae reach 10–15 × up to 3.5 μ, they are conical to narrowly cylindric-rod-shaped, obtuse to acute (in the largest—obtuse), and few (in the large broom cells) to numerous (in the medium sized ones), broom cells hyaline in the main body, setulae either hyaline or deep golden melleous. — Illustration: Fig. 33.

The original label says "*Agaricus fulvus* Bertero. Ad corticem putrescentem

arborum Portorico. Hb. Persoon." There is an addition in what seems to be Léveillé's handwriting which says "*Heliomyces* species nova. Lév."

This specimens keys out and is indeed identical with *Marasmius berteroi* (Lév.) Murrill. However, it is not the large form, more common in most parts of tropical and subtropical America, but the small variety observed several times by Singer in South America.

MERULIUS

MERULIUS CRISPUS Pers., Icon. Descr. Fung. 32. 1800 *ex* Fr., Syst. mycol. **1**: 323. 1821 (as *Cantharellus*).

Authentic material from France preserved in the Persoon Herbarium compares well with Persoon's own and with Fries's (1821) data. It is what is now called *Plicatura crispa* (Pers. ex Fr.) Peck (Meruliaceae).

MERULIUS LEUCOPHAEUS Pers., Mycol. eur. 2: 15. 1825.

The type was collected by Couvin in the Forêt de Branguilly, near Pontivy in the summer of 1811 in a forest of beech, oak, and birch.

Spores 8.5–9.5 × 3.5–4.5 μ, cylindric, inamyloid, smooth, hyaline; metuloids 80–125 × 11–14 μ with walls 3.5–5.5 μ thick, fusiform, acute, incrusted at the apex, amyloid. Hyphae inamyloid.

This is clearly *Geopetalum carbonarium* (A. & S. ex Fr.) Pat.

There is also additional material on another sheet, coming from Eppe, fall, authentic. Here, the spores are slightly smaller, but it is undoubtedly the same species.

Further material, collected by Delastre in August 1825 on burned ground was thought to be perhaps different by Persoon because the veins are "almost all entire, a few ramose above". He had this material under two alternative herbarium names, *M. tephroleucus* and *M. melaleucus*. — Illustration: Fig. 34.

MERULIUS SPATHULARIUS Schw, *in* Schr. naturf. Ges. Leipzig **1**: 92. 1822.

This specimen was apparently sent to Persoon by Schweinitz and must be part of the original type. As such it is very valuable. It represents exactly the species now generally known as *Dacryopinax spathularia* (Schw.) Martin (but perhaps closer to *Calocera?*).

MERULIUS TURFOSUS Pers., Mycol. eur. 2: 26. 1825.

There are three type sheets of which the most complete and apparently original one is L 910.255–523 which is the lectotype, the two others being syntypes. The right lowest specimen is here proposed as lectotype specimen. There are other carpophores on the sheet, six altogether, and they are accompanied by drawings in color which show this in living condition growing on moss over wood (no *Sphagnum*).

This material shows all characters of *Omphalina ericetorum* (Pers. ex Fr.) M. Lange (cf. *Agaricus ericetorum* Pers.).

Spores (6.3–)7.3–8.5 × (3.5–)3.8–4.7 μ, hyaline, smooth, ellipsoid; basidia 29–31 × 3.8–4.7 μ; hymenophoral trama irregularly interwoven and consisting of filamentous hyphae without clamp connections.

Another sheet was sent by the same collector (Mougeot) from the same station (Vosges) and is said to be common in our bogs (tourbières). This here was collected in spring. This was first labeled "*Agaricus turfosus* an *Merulius*?", and then relabeled "*Merulius turfosus* Myc. Europ. 2." This sheet consists of carpophores less well preserved.

The third sheet was already called "*Merulius turfosus* Pers. in lit." by Mougeot. Mougeot says these specimens were collected in spring and promises to observe them better which was apparently urged upon him by Persoon. All three collections are the same thing. This species (*Merulius turfosus* Pers.) is therefore another synonym of *Agaricus ericetorum* Pers. This was also stated by Fries (*in* Linnaea **5**: 709. 1830).

MERULIUS ULIGINOSUS Pers., Mycol. eur. **2**: 22. 1825.

The type ("Auf . . . Moosen in . . . Torfsümpfen. Schleicher" is in very good condition. Numerous spores present. — Illustration: Fig. 35.

Veins simple, near margin all strongly and some repeatedly forked and occasionally anastomosing. There is a smooth stipe-like base as in *Panellus stypticus* but nothing more. The margin of the pileus is lobed. Spores 7.5–9.3 × 5.2–6.3 μ, hyaline, smooth; basidia 23–26(–35) × 5–6 μ. Hyphae with numerous clamp connections.

This is a representative of the genus *Leptoglossum* Karst. (= *Leptotus* Karst.). It is very close if not too close to *L. lobatum* (Fr.) Karst., differing from that species (in the sense of Kühner & Romagnesi) only in smaller spores. However, in a collection of mine from Tierra del Fuego, Est. Nueva Argentina, 17–II–1950, Singer M 323 (LIL) which is otherwise typical for *L. lobatum*, the spores are 7.5–10.3 × 5.8–6.9 μ which would include the spore size ranges of both the small-spored and the large-spored forms of *L. lobatum*, and would suggest that *Merulius uliginosus* Pers. is conspecific and should not be transferred to *Leptoglossum* as an autonomous species. M. Lange (Medd. Grønland **147**: 20. 1955) also indicates spores about 7.5–10.5 × 5.5–7.5 μ large. He indicates a 2-spored form with spores 9–13 × 3–5 μ (his no. ML 348). It is tempting to assume that the specimens with a wide spore range are such as to contain some 2-spored basidia. This is possible even though a superficial search in my Tierra del Fuego material did not reveal the presence of 2-spored basidia.

POLYPORUS

Note: We have studied only those species of *Polyporus* which belong in the Agaricales (not including even the true Polyporaceae).

POLYPORUS VISCOSUS Pers., Mycol. eur. **2**: 41. 1825.

The type was collected by Couvin at Pontivy, Vosges, France.

This specimen clearly refers to what we now call *Suillus bovinus* (L. ex Fr.) O. Kuntze. There is already an annotation by Bresadola attached to this specimen. Brasadola who has studied it, concludes that it represents *Boletus mitis* = *B. bovinus*.

RUSSULA

Russula alutacea (Pers. ex Fr.) Fr.—See *Agaricus alutaceus* Pers.

Russula fragilis Pers. ex Fr.—See *Agaricus fragilis* Pers.

RUSSULA CYANOXANTHA (Schaeff. *ex*) Pers., Abh. essb. Schw. 146. 1822.

Persoon's specimen of this species is preserved.

Pileus smooth and glabrous; stipe white (?); lamellae little forked (if at all). Spores 8.5–11 × 7–9.2 μ, ellipsoid, ornamentation amylaceous, projecting up to 1–1.2 μ, of types IIIb, II–IIIb, II–IIIa (most frequently the latter), IIIa, in ammonia most spores hyaline, some slightly yellowish. Epicutis of pileus with oleiferous hyphae and dermatopseudocystidia with granular to somewhat banded contents. Macrocystidia in hymenium typical and numerous.

This specimen cannot be interpreted in any other way than as *R. parazurea* J. Schäffer. Since in this case Persoon is perhaps the revalidating author, it is a question whether in this example of discrepancy between Schaeffer's and Persoon's concept we accept as type Schaeffer's plate or Persoon's specimen. Schaeffer's plate is not good but has traditionally been interpreted as the species we now generally call *Russula cyanoxantha* (by rare and almost strange coincidence of opinion of all the specialists). It is however possible (but compare Rogers *in* Mycologia **36**: 530. 1944) that Schweinitz (Syn. Fung. Car. sup. *in* Schrift. naturf. Ges. Leipzig **1**: 87. 1822) who also revalidated *Agaricus cyanoxanthus* has priority over Persoon's 1822 paper. For this reason, and considering the situation as a whole, we do not think that any nomenclatorial consequences of the above type analysis should immediately be taken into consideration.

It seems best, for the time being, to leave *R. parazurea* its modern name. At the same time, I considered it necessary to publish pertinent evidence even though, as in the following case, it does not immediately contribute to stability in the nomenclature of the Russulas.

RUSSULA ROSEA Pers., Obs. mycol. **1**: 100. 1796.

The authentic material (which is probably not the original type, but might be) is L 910.262–222 which bears the following inscription: "*Russula rubra* = *Agaricus ruber* Fr. Syst. = *Russula rosea* Obs." Since Fries has a large species, the other sheet with corresponding determination by Persoon should not be taken into consideration.

Spores 8–8.5 × 6.5–7.3 μ, hyaline, with amylaceous exosporial ornamentation of types IV, V, VI, projecting 0.5–0.6 μ; basidia 45 × 13 μ cystidia of the pseudocystidial type, rather numerous, 50–63 × 6–13 μ thin-walled, rarely with a somewhat

thickened (1 μ) wall, with contents which fill the cell partially, fusoid. Hyphae without clamp connections, spherocysts numerous. In epicutis few dermatopseudocystidia, but hardly any of the macrocystidial type. External aspect of *Russula lepida* of modern authors.

This specimen is indeed a typical *Russula lepida* Fr.

Since *Russula rosea* was never revalidated in this sense, this identification has only theorical significance as far as the binomial *R. rosea* is concerned. We may add here, that *Russula rosea* Pers. contains the quotation *A. sanguineus* Batsch, and this latter is quoted as belonging to *Russula lepida* Fr. by Fries himself.

On the other hand, the basionym of *Agaricus rosaceus* Pers., Syn. 439, is *Russula rosea*. We may therefore assume that its revalidation by S. F. Gray (Nat. Arr. Brit. Pl. **1**: 618. 1821) also refers to *Russula lepida* Fr. which latter would become its later synonym. This makes it impossible to use *Russula rosacea* Fr. as a substitute for *Russula sanguinea* (Bull. ex St-Amans) Fr., 1836, which is based on *Agaricus sanguineus* Bull. ex St-Amans, a later homonym of *Agaricus sanguineus* Wulf. ex Fr. In order to abide by the rules of the present Code, *Russula rosacea* Fr. would become *Russula sanguinea* Fr. (1838).

Much more annoying is the definition of *Russula rosacea* (Pers.) ex S. F. Gray as given above since it makes *R. lepida*, one of the rather well known and generally accepted species a synonym. I cannot see, however, how this consequence could possibly be avoided without violating the rules of nomenclature.

This may be the place to correct a statement of my earlier papers (cf. *in* Sydowia **11**: 208. 1957) concerning the presence of bluing elements (dermato-macrocystidia) in the epicutis of *Russula lepida* Fr. [recte: *R. rosacea* (Pers. ex) S. F. Gray]. A careful checkup with specimens collected by this author near Vienna in 1960 showed that there are no elements bluing in sulfovanillin in the type form of this species. This means that *Russula lepidiformis* Murrill differs from *R. rosacea* (Pers. ex) S. F. Gray by the spore characters, not by the structure of the epicutis.

The data on *Russula rosea* also have some importance as far as *Russula rubra* (Lam. ex Fr.) Fr. is concerned. This species was in 1821 described as *Agaricus ruber* by Fries (Syst. mycol. **1**: 58). At that time it was a collective species which consisted of two main 'ingredients': *Agaricus sanguineus* Bull. ex St-Amans and *Agaricus rosaceus* Pers. (*R. rosea* Pers.) as stated by Fries himself, and as is amply clear from his description. Indeed, Persoon who naturally thought that this was a redescription of his species, made the following hand-written comment in his copy of "Systema mycologicum" under *A. ruber*: "Ad maximas pertinet. Pil. planiusculus ad marginem nonnumquam . . . rimulato-squamulosus quasi. Sapor subacris. Pil. 3 unc. latus. Stipes non fragilis." These are observations which attempt to eliminate the sanguineus element from Fries's diagnosis. The terms 'acris' and 'amarus' were still undefined at that time.

Can a satisfactory type be separated from Fries's mixtum compositum? Fries himself felt that his species was not well characterized. He eliminated (1838) both the sanguineus and the rosaceus element, describing both species under *R. rosacea*

and *R. sanguinea* on the one hand as *R. lepida* on the other. Nevertheless, he left *R. rubra* also, still citing Syst. mycol., l.c., but put it in the neighborhood of *R. lepida* Fr. from which it would be distinguished by acrid taste. This species is now as ambiguous as ever even after having been deprived of all those elements which might have been acceptable as lectotypes. Since there are no specimens left, it becomes necessary to abandon *Agaricus ruber* Fr. 1821 as nomen dubium and confusum, and with it *Russula rubra* (Fr.) Fr. which is based on it without being identical with it. Consequently we cannot any more accept Bresadola's interpretation of *R. rubra*, which we propose to replace by the name of one of its synonyms.

Systematic arrangement

of modern taxa affected by, or discussed in connection with, the specimens preserved in the Persoon Herbarium, Rijksherbarium, Leiden, the Netherlands.

Note: The second binomial given refers to the name of the specimen studied in connection with which the respective modern name has been discussed; the second binomial is omitted if it is not in the relation of a type, lectotype, syntype, paratype to the first, at least tentatively. The page numbers indicated refer to the preceding part of this paper. The order of the taxa is mainly in agreement with Singer (1951).

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Lepiota aspera var. *acutesquamosa* (Weinm.) Sing., p. 9
Lepiota acutesquamosa var. *furcata* Kühner, p. 9
Lepiota cristata (A. & S. ex Fr.) Kummer, p. 16
Lepiota clypeolaria (Bull. ex Fr.) Kummer, p. 16
Cystoderma carcharias (Pers. ex Secr.) Fayod — *Agaricus carcharias* Pers., p. 13
Cystoderma sp., p. 29
Cystoderma granulosum (Batsch ex Fr.) Fayod, p. 29

COPRINACEAE:
Coprinus atramentarius (Bull. ex Fr.) Fr., p. 39
Coprinus disseminatus (Pers. ex Fr.) S. F. Gray — *Agaricus disseminatus* Pers., p. 22
Psathyrella velutina (Pers. ex Fr.) Sing. — *Agaricus velutinus* Pers., p. 49
Psathyrella candolleana (Fr.) Maire, p. 45
Psathyrella gracilis var. *corrugis* (Pers. ex Fr.) Pearson & Dennis — *Agaricus corrugis* Pers., p. 18
Panaeolina foenisecii (Pers. ex Fr.) Maire, p. 26

BOLBITIACEAE:
Agrocybe praecox (Pers. ex Fr.) Fayod — *Agaricus praecox* Pers., p. 39, 40

STROPHARIACEAE:
Psilocybe angulata (Batsch ex Pers.) Sing. — *Agaricus angulatus* Batsch ex Pers., p. 6, 7
Kuehneromyces mutabilis (Schaeff. ex Fr.) Sing. & Sm., p. 14

CORTINARIACEAE:
Inocybe sp., p. 16, 38, 45
Inocybe pyriodora (Pers. ex Fr.) Kummer — *Agaricus pyriodorus* Pers., p. 42
Inocybe obscura (Pers. ex Pers.) Gillet, p. 38
Inocybe geophylla (Sow. ex Fr.) Kummer, p. 27
Inocybe argillacea (Pers.) Sing. — *Agaricus argillaceus* Pers., p. 8
Hebeloma fastibile (Pers. ex Fr.) Kummer — *Agaricus fastibilis* Pers., p. 25
Hebeloma testaceum (Batsch ex Fr.) Quél., p. 25
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Hebeloma mesophaeum (Pers.) Quél. — *Agaricus mesophaeus* Pers., p. 25, 33

Hebeloma strophosum (Fr.) Sacc., p. 25
Phaeomarasmius erinaceus (Fr.) Sing., p. 9
Rozites caperata (Pers. ex Fr.) Karst. — *Agaricus caperatus* Pers., p. 13
Cortinarius purpurascens var. *subpurpurascens* Fr., p. 10
Cortinarius porphyropus (A. & S. ex) Fr., p. 10
Cortinarius arenatus (Pers. ex) Fr. — *Agaricus arenatus* Pers., p. 7
Cortinarius alboviolaceus (Pers. ex Fr.) Fr. — *Agaricus alboviolaceus* Pers., p. 4
Cortinarius violaceocinereus (Pers. ex Fr.) Fr. — *Agaricus violaceocinereus* Pers., p. 49
Cortinarius cinereoviolaceus Fr., p. 49
Cortinarius persoonii Henry, p. 24
Cortinarius anomalus (Fr. ex Fr.) Fr., p. 24
Cortinarius sp. aff. *C. pholideus* (Fr. ex Fr.) Fr., p. 8
Cortinarius acutus (Pers. ex Fr.) Fr. — *Agaricus acutus* Pers., p. 3
Cortinarius sp., p. 10, 17, 24, 45
Galerina laevis (Pers.) Sing. — *Agaricus laevis* Pers., p. 231, 232
Galerina graminea (Velen.) Kühner, p. 31
Galerina tibiicystis (Atk.) Kühner, p. 12
Galerina pumila (Pers. ex Fr.) Sing. — *Agaricus pumilus* Pers., p. 41
Galerina mycenopsis (Fr. ex Fr.) Kühner, p. 41
Galerina rubiginosa (Pers. ex Fr.) Kühner — *Agaricus rubiginosus* Pers., p. 43
Galerina vittaeformis (Fr.) Sing., p. 43

CREPIDOTACEAE:
Tubaria autochthona (Berk. & Br.) Sing., p. 22
Tubaria dispersa (Pers.) Sing. — *Agaricus dispersus* Pers., p. 22

RHODOPHYLLACEAE:
Rhodocybe mundulus (Lasch) Sing., p. 17
Rhodocybe popinalis (Fr.) Sing., p. 6, 17
Rhodophyllus chalybaeus (Pers. ex Fr.) Quél. (recte: *Acurtis chalybaeus*) — *Agaricus chalybaeus* Pers., p. 14
Rhodophyllus pascuus (Pers. ex Fr.) Quél. — *Agaricus pascuus* Pers., p. 35, 36
Rhodophyllus politus (Pers. ex Fr.) Quél. (recte: *Acurtis politus*) — *Agaricus politus* Pers., p. 69
Rhodophyllus depluens (Batsch ex Fr.) Quél. (recte: *Acurtis depluens*) — (*Agaricus epigaeus* Pers.), p. 23

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Paxillus panuoides (Fr. ex Fr.) Fr., p. 12, 44

GOMPHIDIACEAE:
Gomphidius rutilus (Schaeff. ex Fr.) Lundell & Nannfeldt — (*Agaricus gomphus* Pers.), p. 28, 29

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Gyrodon lividus (Bull. ex Fr.) Sacc., p. 50
Gyroporus castaneus (Bull. ex Fr.) Quél., p. 50
Gyroporus cyanescens (Bull. ex Fr.) Quél. — (*Boletus constrictus* Pers.), p. 51
Xerocomus subtomentosus (L. ex Fr.) Quél. — (*Boletus subtomentosus* L. sensu Pers.), p. 51
Suillus bovinus (L. ex Fr.) O. Kuntze, p. 54
Boletus sp. — (*Boletus rubeolarius* Sow. ex S. F. Gray sensu Pers.), p. 51

RUSSULACEAE:
Russula cyanoxantha (Schaeff. ex) Pers. — *Russula cyanoxantha* sensu Pers., p. 54
Russula parazurea J. Schaffer, p. 54
Russula rosacea (Pers. ex) S. F. Gray — *Russula rosea* Pers., p. 54

Russula lepida Fr., p. 55
Russula rosacea Fr., p. 55
Russula sanguinea Fr., p. 55
Russula rubra (Lam. ex Fr.) Fr., p. 56
Russula alutacea (Pers. ex Fr.) Fr. — *Agaricus alutaceus* Pers., p. 5
Russula punctata Krombh., p. 6
Russula fragilis (Pers. ex Fr.) Fr. — *Agaricus fragilis* Pers., p. 26
Russula mairei var. *fageticola* (Sing.) Kühn. & Rom., p. 26
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Russula emetica subsp. *lacustris* Sing., p. 26
Lactarius subdulcis (Pers. ex Fr.) Fr. — *Agaricus subdulcis* Pers., p. 46, 47
Lactarius hradecensis Z. Schaefer, p. 47
Lactarius necator (Bull. ex Fr.) Karst. — *Agaricus necator* Bull. sensu Pers., p. 35
Lactarius turpis (Weinm.) Fr., p. 35

APHYLLOPHORALES:

MERULIACEAE:
Plicatura crispa (Pers. ex Fr.) Peck — *Merulius crispus* Pers., p. 52

DACRYOMYCETALES:

DACRYOMYCETACEAE:
Dacryopinax spathularia (Schw.) Martin — *Merulius spathularia* Schw., p. 52

2. Discussion and conclusions

In the preceding type studies 137 species were analysed or anotated of which we may distinguish the following categories:

1. Persoonian or other species which are pre-Friesian and are in agreement with the concept of the revalidating author: 59 instances.

2. Persoonian or other species which never were revalidated: 5.

3. Persoonian or other species which are pre-Friesian and are in disagreement with the concept of the revalidating author: 10.

4. Post-Friesian Persoonian or other species which are revalidations of pre-Friesian species: 12.

5. Post-Friesian Persoonian and other species which do not refer to pre-Friesian basionyms: 46.

6. Persoonian or other material which is not in agreement with the respective diagnoses: 8.

As for the first category, the large number of instances is one of the main contributing factors why the name changes necessary have not been numerous. However, one should not think that all of these specimens are types of Persoon which were later validated by Fries or his school. Many were validated by Persoon himself (1825–8) or by his school (S. F. Gray). If they were validated by Persoon himself and the specimens are not types of the pre-Friesian description, they were also counted as examples under category 4.

In category 2 there would be little of interest if it were not for the fact that some of these names are basionyms of other published names.

Category 3 is particularly interesting because in this case we may well judge whether the use of a pre-Friesian (original) type is preferable to the recognition of only the type of the revalidating author. In the case of *Agaricus arenatus*, there are two interpretations for Fries's concept, and no certain one for Bulliards; although the first dilemma seems better than the second, we do not count this as a significant case. The same is true for *A. bryophilus* where the pre-Friesian concept is as vague as the Friesian, and no generally accepted interpretation exists. Other inconclusive cases are those of *A. sagarum* and *A. conocephales*. In the case of *A. granulosus*, the typification question is irrelevant. However the cases of *A. integrellus*, *A. myomyces*, *A. pascuus*, *A. rubiginosus*, and *Russula cyanoxantha* seem pertinent. In all these cases, the recognition of the original pre-Friesian type would either jeopardize well introduced familiar names in favor of little known or new ones (*Delicatula integrella Tricholoma terreum, Rhodophyllus pascuus, Galerina rubiginosa*) or on the contrary save a well introduced and familiar name (*Russula cyanoxanantha* which would otherwise be applied to a species described as new in the thirties of this cenry (*R. parazurea*). However, there is only this one last case—and this one still quite inconclusive—against four. We do not wish to elaborate further since it is not the purpose of the present paper to furnish arguments for on against a certain interpretation of the rules.

In category 4 we find a surprising number of cases where Persoon appears as the revalidating author. In all these cases, we have assumed that his type is the decisive one inasmuch as in all these cases the alternative would be the typification by extremely vague descriptions or often rather poor illustrations. We do not wish to elaborate on the desirability of an alternative attitude on typification in these cases since most of them deal with binomials which are now often ignored or reduced to synonymy.

In category 5 we have all the species published by Persoon (and some few by other authors) after 1821, i.e. a large number of those published by him in "Mycologia europaea". These names furnish the largest percentage of unexpected name changes since they were validly published with deposition of a more or less identifiable type specimen (or authentic material in full agreement with the diagnosis) by a mycologist unsurpassed in his time in experience and exactness of observation but were largely ignored by the mycologists since then until our days. This is partly due to Fries's negative attitude towards "Mycologia europaea",[1] partly to the difficulty of using the book, unfinished and index-less as it was. Later on mycologists were much too much influenced by Fries's work and much too bewildered by the somewhat unwieldy accumulation of diagnose after diagnose in *Agaricus* to make much use of Persoon's final work, so that the good species there described were never

[1] The reader will find rather harsh criticism of this work by E. M. Fries *in* Linnaea **5**: 689–731, especially page 699; later on Fries rarely accepted any of the species described by Persoon between 1825 and 1828 and indicated many as synonyms of his own. This appreciation of Persoon's latest work is only in part justified by the text, and not at all in view of the existing specimens which, of course, would have been of little value for Fries, but give Persoon's species much more weight nowadays than they would otherwise have had.

acknowledged, nor newer collections compared with them, and consequently most of them were redescribed as new by other authors whose names entered the modern floras and monographs.

In the last (sixth) category we are dealing mainly with later misderminations, not always by Persoon himself but by his collectors whose tentative determinations were left unchanged by Persoon. It is however remarkable (and does prove that Persoon was well familiar with his species) that so few cases have come to my attention while studying his Herbarium. Naturally, not eight examples, but many more might be found in the collection—and which modern mycologist would not have committed many more errors?—as those counted here refer exclusively to such cases where the only clue or one of few clues was an 'authentic' specimen—which however did not agree with the diagnosis.

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MYRIANGIALES FROM INDONESIA

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The Hague

(With three Text-figures)

A systematic account of the Myrangiales known to occur in Indonesia is given. The order is represented by 9 genera containing together 15 species distributed over 5 families. The genus *Micularia* Boedijn and two species (*Micularia merremiae* Boedijn, *Elsinoë fici* Boedijn) are described as new. Additional collections are cited for most of the other species. *Agyrona calami* (Rac.) Boedijn is a new combination.

Representatives of the Myriangiales are especially abundant in tropical regions. In Indonesia I was able to collect specimens of all the families distinguishable in the order. The number of species is far inferior to that of other orders of Ascomycetes.

The chief character of the Myriangiales is to be found in the form and the arrangement of the asci, which are more or less globose, thick-walled, and distributed singly in cavities of the ascostroma, being separated from each other by persistent stromatic pseudoparenchyma.

ATICHIACEAE

Mycelium lacking. Ascomata pulvinate or star-shaped, composed of threads embedded in a gelatinous matrix. Propagulae many-celled, formed on outside, or in cavities, of thallus. Asci thick-walled, in monascous locules, either within the ascoma proper or in special swellings of it. Ascospores 1-septate, pale coloured. Saprophytes on insect secretions on leaves of vascular plants.

Phycopsis Mangin & Pat.

Phycopsis Mangin & Pat. *in* C.R. Acad. Sci., Paris **154**: 1480. 1912.

Ascomata more or less semiglobose, brown, consisting of toruloid hyphae embedded in a gelatinous matrix which turns blue with J; cells on outside encrusted with brown granules. Propagulae formed on outside of thallus, globose, many-celled. Asci thick-walled, especially so near the apex, originating near the periphery, separated from each other by the tissue of the tallus. Ascospores 1-septate, pale coloured.

Phycopsis treubii (Höhn.) Boedijn

Phycopsis Treubii (Höhn.) Boedijn *in* Bull. Jard. bot. Buitenzorg, 3e Sér., **11**: 228. 1931.
Atichia Treubii Höhn. *in* Ann. Jard. bot. Buitenzorg, 2e Sér., Suppl. **3**: 27. 1909.
Phycopsis Dennisii Batista & Peres *in* Nova Hedwigia **2**: 467. 1960.

Ascomata subglobose, cylindrical, conical or subclavate, often arranged in rows, or forming lobed masses in which the outlines of the constituent thalli are more or

less visible, in the fresh state gelatinous and translucent, olive brown, when dry brittle and black, 72 μ to 2 mm long, 100–150 μ high, internally subhyaline, composed of parallel cell chains which are often connected with each other and embedded in a hyaline mucus which stains deeply blue with iodine; cells of chains globose to ellipsoid, 3–6 μ, gradually increasing in size toward the periphery and there up to 14 μ long; cells on outside of thallus globose, 4–8 μ in diam., provided with numerous brown granules. Propagulae originating in outer layer of thallus, protruding as globose bodies 15–35 μ in diam., build up of globose cells 3–8 μ in diam., the peripherical ones incrustated with brown granules. Asci originating near top of thallus, more or less in a single layer, the individual asci isolated within the tissue, mostly formed after the majority of the propagulae has disappeared, globose to egg-shaped, 8-spored, the wall thickened at the apex, 24–35 × 18–28 μ. Ascospores conglobate, broadly ellipsoid, 2-celled, slightly constricted at the cross-wall, the apical cell mostly slightly broader than the basal one, 9.5–22 × 7–9.5 μ, hyaline, at last pale brown.

KRAKATAU, Nov. 1932, *Boedijn*, on *Calophyllum inophyllum*.

JAVA, Bogor, Dec. 1948, *van Wiersum*, on *Citrus* sp.; Bogor, Dec. 1957, *Boedijn*, on *Citrus* spec.; Hortus Bogoriensis, Oct. 1949, *Boedijn*, on *Eugenia aromatica*, June 1950, *Boedijn*, on *Psychotria malayana*, June 1953, *Boedijn*, on *Ficus* sp., Jan. 1954, *Boedijn*, on *Strychnos Horsfieldiana*; Tjibodas, June 1953, *Boedijn*, on *Grevillea* sp.; Gunung Salak, Tjiapus, Sept. 1953, *Boedijn*, on *Eugenia aromatica*.

ATICHIA Flotow

Atichia Flotow *in* Linnaea **23**: 149. 1850.
Heterobotrys Sacc. *in* Michelia **2**: 21. 1880.
Actinomma Sacc., Misc. mycol. **1**: 28. 1884.
Seuratia Pat. *in* Bull. Soc. myc. France **20**: 136. 1904.
Euthrypton Theiss. *in* Verh. zool.-bot. Ges. Wien **66**: 325. 1916.

Ascomata star-shaped, consisting of threads embedded in a gelatinous matrix, not reacting with iodine; cells on outside brown. Propagulae formed in cavities of the thallus, triangular, many-celled. Asci thick-walled at the apex, originating in special swellings of the thallus, separated from each other by the tissue of the thallus. Ascospores 1-septate, pale coloured.

ATICHIA MILLARDETII Rac.

Atichia Millardetii Rac., Par. Alg. u. Pilze Java's **3**: 41. 1900.
Seuratia coffeicola Pat. *in* Bull. Soc. myc. France **20**: 136. 1904.
Atichia dominicana Cotton *in* Kew Bull. **1914**: 59.

Ascomata irregularly star-shaped, dark-coloured, usually black, with 3–8 rays which in old specimens are irregularly pinnately or sometimes even bipinnately branched; 0.5–10 mm in diam., gelatinous, build up of more or less ovoid cells 4–7 μ long, forming winding, toruloid hyphae embedded in a subhyaline mucus which does not stain with iodine, the cells near the periphery brown, the others subhyaline; pockets formed in the rays, either globose 50–70 μ in diam. or more often elongated 100–600 × 50–100 μ, these cavities typically dark-coloured by the presence of the propagulae. Propagulae more or less triangular in outline, flattened, build up of brown, ovoid to ellipsoid cells 3–5 μ long, the whole structure measuring 18–22 μ along one of the sides; on the corners mostly 2–3 projecting, colourless threads, 8–10 × 1–2 μ. Fertile portions also formed on the rays as round to oval, pulvinate, projecting parts 78–130 μ in diam. or 85–153 × 61–112 μ and

50–80 μ high. Asci formed in these cushions in a more or less single layer, the individual asci isolated within the tissue, ovoid, 8-spored, thick-walled at the apex, 34–48 × 25–28 μ. Ascospores conglobate, ovoid, 2-celled, constricted at the septum, with rounded poles, 16–19 × 6–9 μ, pale brown.

JAVA, Bogor, on *Anacardium occidentale*, *Cinnamomeum zeylanicum*, *Coffea arabica*, *Styrax benzoin*, *Syzygium jambolanum*, according to Raciborski; March 1935, *Boedijn*, on *Eugenia aromatica*; Jan. 1950, *Boedijn*, on *Phaeomeria speciosa*; May 1956, *Boedijn*, on *Eugenia* sp.; Hortus Bogoriensis, Nov. 1949, *van der Laan*, on leaves of undetermined plant; Jan. 1954, *Boedijn*, on *Memecylon floribundum*.

PIEDRAIACEAE

Mycelium hardly developed, represented only by small plates of pseudoparenchyma in the host. Ascomata pulvinate, pseudoparenchymatous, not gelatinous. Asci thin-walled, in monascous locules in a single layer. Ascospores 1-celled, cylindrical, with an appendage at each pole, hyaline. Parasites on the human hair.

PIEDRAIA Fonseca & Leão

Piedraia Fonseca & Leão *in* Mem. Inst. Oswaldo Cruz, Suppl. **4**: 124–127. 1928.

Mycelium much reduced. Ascomata superficial, black, pulvinate to elongated, of a pseudoparenchymatous structure, pale brown with a dark-coloured outer layer. Asci thin-walled, in monascous locules within the ascoma. Ascospores 1-celled, more or less cylindrical, with an appendage at each pole, hyaline.

PIEDRAIA JAVANICA Boedijn & Verbunt

Piedraia javanica Boedijn & Verbunt *in* Mycopathologia **1**: 196. 1938.

Ascomata black, at first more or less pulvinate, then elongated and up to 0.75 mm long, 130–187 μ high, on section pseudoparenchymatous, consisting of dull brown cells 4–8 × 3–4 μ, chiefly arranged in regular vertical rows; near the periphery with a darker coloured layer; locules in pseudoparenchyma 50–100 μ in diam., arranged in a single layer, each locule containing 1 ascus, rarely 2. Asci broadly ellipsoid, short-stalked, 8-spored, thin-walled. Ascospores at first irregularly arranged, 2–3-seriate, soon parallel in a fascicle, sometimes provided with a few oil-drops, long cylindrical, with rounded tips, sometimes unequal-sided or more or less curved, seldom crescent-shaped, thick-walled, with a straight or curved appendage at each pole, 20–60 × 4–12 μ, usually 40–44 × 8–10 μ; appendages 2–28 × 1.5–3.5 μ; when mature very pale greenish to hyaline.

JAVA, Purbalingga, *Kal*; Purwokerto, *Oosterveen*; Djakarta, 1948, *Rijkebusch*.

SACCARDIACEAE

Mycelium only in hairs of host, very small. Ascomata pulvinate, pseudoparenchymatous, sometimes with bundles of small hairs at apex. Asci thick-walled, in monascous locules within the ascostroma in an irregular layer. Ascospores with 1 or 3 cross-walls, hyaline. Parasites in hairs and glandular scales of vascular plants.

MOLLERIELLA Winter

Molleriella Winter *in* Bol. Soc. broter. **4**: 199. 1886.

Mycelium very much reduced. Ascomata superficial, pulvinate, pseudoparenchymatous, with an outer layer of brown cells. Asci thick-walled, irregular distributed in the pseudoparenchyma but more or less in a single layer, one in each locule. Ascospores 3-septate, hyaline.

MOLLERIELLA MIRABILIS Winter — FIG. 1

Molleriella mirabilis Winter *in* Hedwigia **25**: 102. 1886.

Ascomata more or less kidney-shaped, dark-coloured, 35–86 μ across, 20–50 μ high, on section showing an indistinct sybhyaline pseudoparenchyma with the asci in a single though irregular layer near the surface, with one ascus in each cavity; on the outside a layer of dark angular cells 2–6 μ in diam. which in older specimens separate so that the asci can be seen shining through. Asci globose to subglobose, 8-spored, the wall thickened at the apex where it is up to 3 μ thick, 20–25 × 17–19 μ. Ascospores conglobate to fasciculate, cylindrical, straight or curved with rounded poles, 2–3-septate, 11–14 × 3.5–5 μ, hyaline.

JAVA, Hortus Bogoriensis, July 1953, *Boedijn*, on the glandular scales on both sides of the leaves of *Ipomoea pes-caprae*.

Typically the ascomata are laterally attached to the scales and up to three of them may develop on a single scale. It is curious that von Höhnel (*11*), who studied Winter's type material, interprets the scales as the eggs of a mite. The scales are yellowish and the mycelium of the fungus forms dark, radially arranged bands within the cells, which, however, remain still discernable. Von Höhnel states that the eggs are 44 μ long and 36 μ broad. In my material the scales are 36–48 μ across. The leaves of the host plant are apparently perfectly healthy and the fungus can only be detected with the aid of a hand-lens.

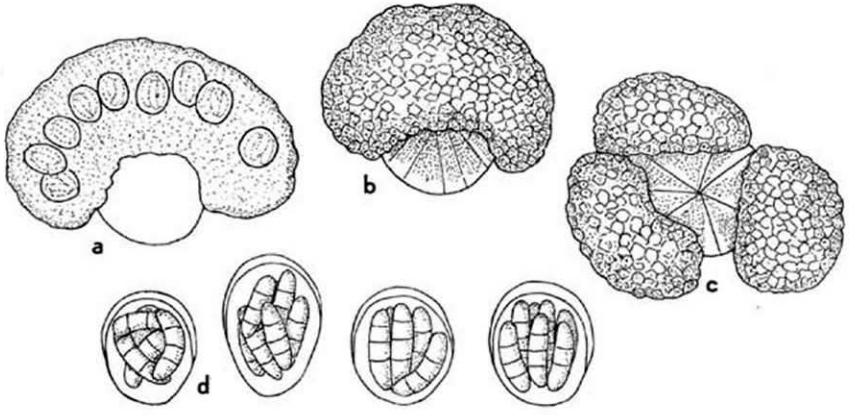


FIG. 1. *Molleriella mirabilis* Winter. — a. Ascoma in section. b. Ascoma on a glandular scale. c. Three ascomata on a glandular scale. d. Asci with ascospores.

MOLLERIELLA SIRIH Zimm.

Molleriella sirih Zimm. *in* Cbl. Bakt. (II. Abt.) **7**: 140. 1901.

Ascomata small, dark-coloured, semiglobose, with an uneven surface, 80–100 μ in diam. Asci formed in the pseudoparenchymatous ground tissue in an irregular layer near the periphery, one ascus in each locule, 8-spored, pear-shaped, 18–20 × 12–14 μ. Spores more or less fasciculate, ellipsoid, often slightly attenuated near the base, 3-septate, straight or somewhat curved, 10–13 × 4 μ, hyaline.

JAVA, Bogor, on hairs on both sides of the leaves of *Piper betle*.

Description after Zimmerman.

Micularia Boedijn, *nov. gen.*

Ascomata hypophylla, pulvinata, copiosissime distributa, atra, superficialia, punctiformia, apicibus breviter setosis, setulis fasciculatis. Asci solitarii, crasse tunicati, octospori in orbem dispositi. Sporidia oblonga, medio 1-septata, hyalina. — Typus: *Micularia merremiae* Boedijn.

Ascomata superficial, pulvinate, black, with bundles of small spreading hairs at the apex. Asci in an irregular ring near the apex, the individual asci separated by pseudoparenchyma, thick-walled, globose, 8-spored. Spores oblong, 1-septate, hyaline.

Micularia merremiae Boedijn, *nov. spec.* — FIG. 2

Ascomata hypophylla, per totam folii superficiem copiosissime distributa, atra, pulvinata, 65–122 μ diam., 65–99 μ crassa, ad apicem setulis brunneis, septatis, 13–32 × 2.5–7 μ obsita. Interne pseudoparenchymatica e cellulis 4–8 μ longis composita. Asci octospori, crasse tunicati, globosi, 17–23 μ diam. in orbem dispositi. Sporidia oblonga, media parte 1-septata, leniter constricta, intus guttulis minutis repleta, 12–16 × 5–6 μ, hyalina.

Ascomata pulvinate, black, 65–122 μ across, 65–99 μ high; on top provided with a varying number of simple, septate, brown hairs, 13–32 × 2.5–7 μ, sometimes slightly constricted at the septae, usually in spreading bundles, in old specimens often nearly wanting; on section ascomata consisting of pale coloured pseudoparenchyma, the angular cells 4–8 μ long; on the outside a dark coloured layer. Asci in the pseudoparenchyma in an irregular ring near the apex of the ascocarp, thick-walled, 8-spored, globose, 17–23 μ in diam.; in water the outer wall ruptures and a cylindrical, thin-walled endo-ascus of 45–58 × 10–13 μ is thrust forward, piercing the pseudoparenchyma and protruding far beyond the ascocarp, the spores then violently shot away. Ascospores oblong to ellipsoid, hyaline, 1-septate, slightly constricted at the septum, filled with numerous minute droplets, 12–16 × 5–6 μ.

JAVA, Hortus Bogoriensis, June 1953, May 1954, May 1956, *Boedijn*, on the glandular scales on the underside of the leaves of *Merremia* sp.

The ascocarps are always situated singly on top of the scales. When detached they show a circular scar at the base. In this case, too, the leaves are seemingly healthy and the fungus can only be found with the aid of a hand-lens.

ELSINOACEAE

Mycelium well developed inside the tissues of the host. Ascomata pulvinate, originating in or under the epidermis and protruding at maturity. Asci thick-

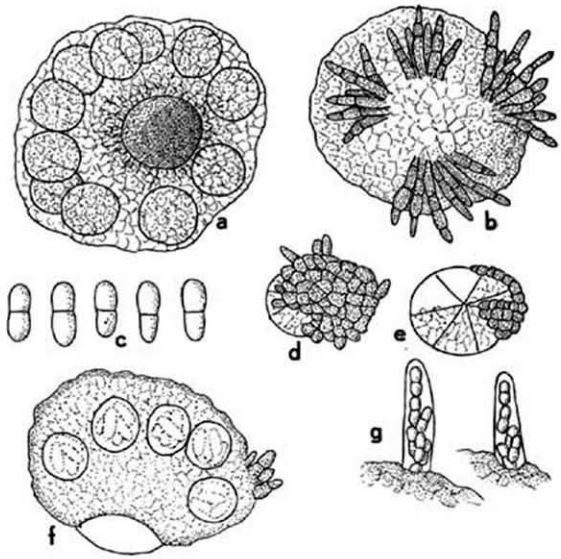


FIG. 2. *Micularia merremiae* Boedijn, *nov. spec.* — a. Ascoma seen from below and made transparent to show the asci and showing the place of attachment to the glandular scale of the host as a circular scar at the centre. b. Ascoma seen from above. c. Ascospores. d, e. Early stages of developing ascomata on glandular scales. f. Ascoma in section. g. Asci protruding through the outer layers of the ascomata.

walled at the apex, distributed in monascous locules at various levels in the pseudoparenchyma of the ascostroma. Ascospores 3-septate, sometimes with a longitudinal wall in one of the middle cells, hyaline. Parasites in the leaves and sometimes also stems and fruits of vascular plants.

ELSINOE Rac.

Elsinoe Rac., Par. Alg. u. Pilze Java's **1**: 14. 1900.
Plectodiscella Woronichin *in* Mycol. Cbl. **4**: 232. 1914.

Mycelium inside the host. Ascomata developing in or under the epidermis and protruding at maturity, consisting of a hyaline or subhyaline pseudoparenchyma, without definite cortex. Asci thick-walled at the apex, originating at different levels in the pseudoparenchyma, each ascus in a separate cavity, 8-spored. Ascospores hyaline, 3-septate, sometimes also with a longitudinal wall in one of the middle cells. Conidial fructification pertaining to the form-genus *Sphaceloma* Bary.

ELSINOE CANAVALIAE Rac.

Elsinoe canavaliae Rac., Par. Alg. u. Pilze Java's **1**: 14. 1900.

Ascomata developing under the epidermis, causing hypertrophy of the underlying tissue which results in the formation of mostly crowded and often confluent blisters, 1–10 mm long, 2–3 mm broad, of a dull reddish colour, about between vinaceous fawn and avellaneous (Ridgway), turning grey when old and dry; between mesophyll and epidermis a subhyaline pseudoparenchyma, 20–48 μ thick, is formed wherein the asci originate in an irregular arrangement, singly or in groups, but always isolated from one another by the ground tissue. Asci globose to subglobose, 8-spored, 18–20 μ in diam. or 19–20 × 14–16 μ, with slightly thickened apex. Ascospores conglobate to parallel, ellipsoid, straight, at one pole often slightly attenuated, 3-septate, 10–12 × 3–4 μ, hyaline.

JAVA, Bogor, *Raciborski*, on leaves of *Canavalia gladiata*; Jan. 1913, *Smith*, on leaves of *Canavalia obtusifolia*; July 1949, *Boedijn*, on leaves and stems of *Canavalia maritima*; Nov. 1949, *Boedijn*, on leaves and pods of *Canavalia ensiformis*; Jan. 1950, *Boedijn*, on leaves of *Canavalia maritima*.

ELSINOE MENISPERMACEARUM Rac.

Elsinoe menispermacearum Rac., Par. Alg. u. Pilze Java's **1**: 15. 1900.

Ascomata forming dark brown, roundish spots, 1–2 mm in diam. in leaves, but hardly causing any hypertrophy; under the epidermis a narrow layer of pseudoparenchyma is formed wherein the asci originate in an irregular layer, each ascus more or less isolated from the others by interascal tissue. Asci subglobose, rather thick-walled, 8-spored, 18–23 × 14–17 μ. Ascospores conglobate or more or less parallel, ellipsoid, straight, 3-septate, 10–12 × 2.5–4 μ, hyaline.

JAVA, Bogor, *Raciborski*, on leaves of *Tinospora crispa* and *T. cordifolia*; Banten, Gunung Sari, May 1931, *Boedijn*, on leaves of *Stephania hernandifolia*.

ELSINOE PHASEOLI Jenkins

Elsinoe phaseoli Jenkins *in* J. agr. Res. **47**: 788. 1928.

Ascomata in or under the epidermis, causing irregular, roundish, reddish brown spots, 2–5 mm long; pseudoparenchyma with an irregular row of asci. Asci ovoid or subellipsoid, 8-spored, the wall thickened at the apex, 30–40 μ in diam. Ascospores parallel, oblong, ellipsoid, the basal part sometimes more obtuse than the apical, 3-septate, sometimes with a longitudinal septum in one of the central cells, 13–15 × 5–6 μ, hyaline.

KRAKATAU, May 1928, *Docters van Leeuwen 11,750*, on pods of *Phaseolus adenanthus*.

Since the material was immature the description is partly after Jenkins.

ELSINOE VITICOLA Rac.

Elsinoe viticola Rac., Par. Alg. u. Pilze Java's **2**: 4. 1900.

Ascomata especially on the underside of the leaves and on the larger veins where raised, brown spots are produced by hypertrophy of the leaf tissue; pseudoparenchyma is formed between the cells of the gall and in this tissue the asci originate in irregular groups of 2–16, separated from each other by pseudoparenchyma.

Asci globose to egg-shaped, 8-spored, thick-walled, up to 32 μ long, 26–28 μ broad. Ascospores long-ellipsoid, 2–3-septate, 15–18 × 4–4.5 μ, hyaline.

JAVA, *Raciborski*, on the leaves of *Vitis serrulata*.

Description after Raciborski as no additional material could be procured.

ELSINOE ANTIDESMAE Rac.

Elsinoe antidesmae Rac., Par. Alg. u. Pilze Java's 1: 15. 1900.

Ascomata on the underside of the leaves, especially on the main ribs, giving rise to more or less elongated, dark grey warts, 1–10 mm long, 0.5–1.5 mm broad; under the epidermis of these structures a layer of pseudoparenchyma is formed containing the asci which are irregularly distributed. Asci thick-walled, subglobose to more or less egg-shaped, 8-spored, 21–23 × 19–21 μ. Ascospores ellipsoid, 2–3-septate, up to 14 μ long, 2–3 μ broad, hyaline.

JAVA, Bogor, *Raciborski*, on the leaves of *Antidesma heterophylla*.

No additional material was collected. Description after Raciborski.

Elsinoe fici Boedijn, *nov. spec.* — FIG. 3

Ascomata hypophylla, subepidermalia, pulvînata, minuta, erumpentia, 250–500 μ diam., 50–150 μ crassa. Stroma pseudoparenchymaticum, subhalinum. Asci solitarii, ovoidei vel piriformes, octospori, 26–37.5 × 17.5–21.5 μ. Sporidia conglobata vel fasciculata, hyalina, oblonga, recta, interdum basin versus sensim attenuata, 3-septata, 19.5–16 × 4–6 μ.

Ascomata on the underside of leaves, under the epidermis, very inconspicuous, forming minute, flat blisters hardly visible by the unaided eye, 0.25–0.5 mm in diam., then rupturing the epidermis and protruding, up to 50–150 μ high; stromatic tissue

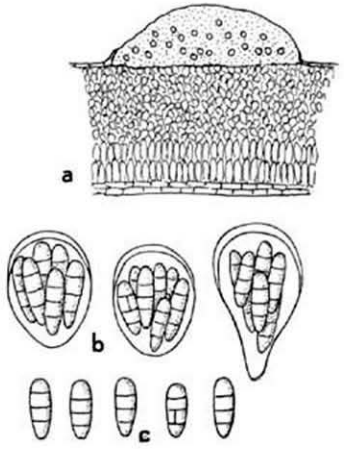


FIG. 3. *Elsinoe fici* Boedijn, *nov. spec.* — a. Section through ascoma. b. Asci. c. Ascospores.

indistinctly pseudoparenchymatous, subhyaline. Asci distributed at random in the pseudoparenchyma, ovoid to nearly pear-shaped, thick-walled at the apex, 8-spored, 26–37.5 × 17.5–21.5 μ. Spores at first conglobate, then more or less parallel, oblong ellipsoid, sometimes slightly attenuated near the base, 3-septate, sometimes with a longitudinal septum in one of the middle cells, 12.5–16 × 4–6 μ, hyaline.

JAVA, Hortus Bogoriensis, July 1953, *Boedijn*, on leaves of *Ficus glomerata*.

MYRIANGIACEAE

Mycelium inside the host, sometimes poorly developed. Ascomata pulvinate, erumpent or superficial, pseudoparenchymatous. Asci thick-walled, in monascous locules, irregularly distributed throughout the ascomata. Ascospores muriform, hyaline or coloured. Parasites on leaves or on scale insects.

AGYRONA Höhn.

Agyrona Höhn. *in* S.B. Akad. Wiss. Wien (Math.-nat. Kl., I. Abt.) **118**: 88. 1909.

Mycelium in the host. Ascomata pulvinate, protruding, pseudoparenchymatous, pale coloured with dark outer layer. Asci in a single layer, thick-walled, 8-spored. Ascospores muriform, subhyaline.

Agyrona calami (Rac.) Boedijn, *comb. nov.*

Phymatosphaeria calami Rac., Par. Alg. u. Pilze Java's **2**: 4. 1900.
Myriangium calami (Rac.) Henn. *in* Hedwigia **39**: 111. 1900.

Spots on the host orange yellow, up to 2 cm broad. Within these spots the ascomata originate; these are pulvinate and up to 250 μ broad, 50–74 μ high, protruding through the stomata, pale coloured with dark outer layer. Asci in a single layer, isolated from each other by pseudoparenchyma, thick-walled, ovoid, attenuated near the base, 8-spored, 26–32 × 17–19 μ. Ascospores muriform, 8-celled, 10–12 × 4–5 μ, subhyaline.

JAVA, Bogor, *Raciborski*, on the leaves of *Calamus* sp.

ANHELLIA Rac.

Anhellia Rac., Par. Alg. u. Pilze Java's **2**: 10. 1900.

Mycelium in the host. Ascomata black, flat with narrow base, originating under the epidermis and protruding at maturity, pseudoparenchymatous. Asci in a layer near the periphery, isolated from each other by pseudoparenchyma, thick-walled. Ascospores oblong, muriform, brown.

The genera *Agyrona* Höhn. and *Anhellia* Rac. are according to the descriptions hardly different. Unfortunately I could not study the types and new collections were not available.

ANHELLIA TRISTIS Rac.

Anhellia tristis Rac., Par. Alg. u. Pilze Java's **2**: 10. 1900.

Spots on the host pale green with rose coloured centre, up to 5 mm in diam. On the underside of these spots the ascomata originate which are flat with narrow base, black, sharp edged, up to 1.8 mm in diam., consisting of brown pseudoparenchyma with a darker layer at the outside. Asci near upper surface, globose, thick-walled, 8-spored, about 40 μ in diam. Ascospores oblong, muriform, consisting of 8–16 cells, up to 30 μ long, 14 μ broad, brown.

JAVA, Tjibodas, on the leaves of *Vaccinium Teysmannianum*.

MYRIANGIUM Mont. & Berk.

Myriangium Mont. & Berk. *in* Lond. J. Bot. **4**: 72. 1845.
Phymatosphaeria Pass. *in* Nuovo G. bot. ital. **7**: 138. 1886.
Pyrenotheca Pat. *in* Bull. Soc. bot. France **33**: 155. 1886.
Diplotheca Starb. *in* Bot. Notiser **1893**: 30.
Phymatodiscus Speg. *in* Bol. Acad. Cordoba **23**: 484. 1919.

Mycelium hardly developed. Ascomata dark-coloured, cushion-shaped, covered by more or less obconical, crowded outgrowths; on section pale coloured, pseudoparenchymatous. Asci embedded singly in the tissue of the outgrowths, distributed at different levels, thick-walled. Ascospores muriform, hyaline to pale coloured.

MYRIANGIUM DURIAEI Mont. & Berk.

Myriangium Duriaei Mont. & Berk. *in* Lond. J. Bot. **4**: 73. 1845.
Collema glomerulosum Tayl. (non Ach.) *in* Mackay, Fl. Hibern. **2**: 108. 1836.
Phymatosphaeria abyssinica Pass. *in* Nuovo G. bot. ital. **7**: 188. 1875.
Cenangium asterinosporum Ell. & Everh. *in* Bull. Torrey bot. Club **10**: 76. 1883.
Pyrenotheca yunnanensis Pat. *in* Bull. Soc. bot. France **33**: 155. 1886.
Phymatosphaeria brasiliensis Speg., Fungi Puigg. 174. 1889.
Phymatosphaeria argentina Speg., Fungi argentini novi v. crit. 299. 1899.
Myriangium yunnanense (Pat.) Rac., Par. Alg. u. Pilze Java's **3**: 41. 1900.
Myriangium argentinum (Speg.) Sacc. & Syd. *in* Sacc., Syll. Fung. **16**: 800. 1902.
Myriangium philippinense Syd. *in* Ann. mycol., Berl. **12**: 567. 1914.

Ascomata black, flat cushion-shaped, consisting of a level base 2–4 mm in diam. with a thin, often radially plicate border on which more or less turbinate tubercles with flattened tops are closely packed; these outgrowths up to 0.5 mm high, 200–550 μ broad; on section the whole ascoma appears pseudoparenchymatous, at first very pale, nearly white, turning brownish in older specimens, the cells 2–7 μ long and often more or less vertically arranged; on the outside with a darker layer; in the tissue of the tubercles numerous monascous cavities are found irregularly distributed at various levels. Asci wholly filling the cavities, subglobose, 8-spored, 38–51 × 25.5–39 μ; wall at the apex 3–9 μ thick. Ascospores conglobate, oblong-ovoid, the ends rounded, mostly 7-septate, constricted at the medium septum, with one or more longitudinal septa in each locule, 17–30 × 8–10 μ, colourless, later slightly coloured.

On scale insects.

JAVA, Bogor, April 1929, *Bakhuizen van den Brink 7028*, on stem of *Citrus medica*, March 1949, *Reitsma*, on stem of *Carica papaya*; Hortus Bogoriensis, July 1950, *Boedijn*, on leaves of *Zamia muricata*, June 1953, *Boedijn*, on leaves of *Encephalartos* sp., June 1953, *Boedijn*, on leaves of *Cycas Rumphii*; Pasar Minggu near Djakarta, April 1949, *Reitsma*, on stem of *Citrus* sp.

In specimens growing on scale insects on stems, plates of brown pseudoparenchyma penetrate the cortex, procuring a firm holdfast for the ascocarps.

DISCUSSION

The classification of the Myriangiales is at present rather unsatisfactory. Complete developmental studies are lacking, and, hence, only a preliminary arrangement suggesting the relationships of the different families can be attempted. Biological characters like the mode of living, and primitive features such as can be found in the morphology of the ascospores should be taken into account.

The forms that I would place at the base of the order are the representatives of the family Atichiaceae. These fungi do not possess a mycelium, but consist of a compact thallus which serves nutrition as well as propagation. They live as saprophytes on the excretions of insects and are, therefore, often associated with sooty moulds.

The genus *Phycopsis* is perhaps the most primitive since its thallus is a semiglobose body in which the asci are formed near the surface, no trace of a special fruiting structure being found. On the other hand, in *Atichia* the thallus is definitely star-shaped and the asci arise in distinct swellings which thus form the first indications of a fruit-body. In both genera the ascospores are pale coloured and only one-septate.

The family which may be derived from the Atichiaceae is that of the Saccardiaceae. Here a much reduced mycelium can already be distinguished by which the ascomata are attached to hairs of vascular plants, especially to glandular scales, which they parasitize. The representatives of this family have become parasites, but because they only attack trichomes, the host-plant is seemingly not affected. The ascomata are pulvinate, sometimes with some small bundles of hairs at the apex. The ascospores are one-septate in *Micularia*, mostly three-septate in *Molleriella*.

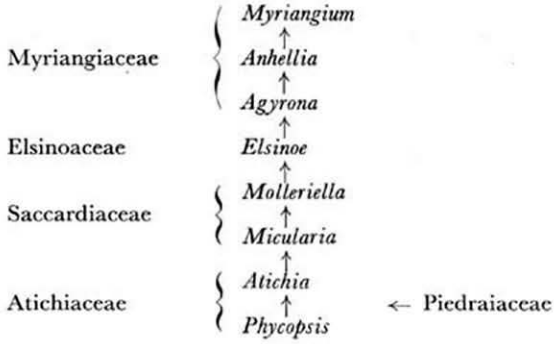
The next family which in its turn may be connected with the Saccardiaceae, is the Elsinoaceae. These are parasites within the leaves of vascular plants; they possess a well developed mycelium growing between the cells of the host. The ascocarps develop in, or more often, under the epidermis and protrude more or less at maturity. The hyaline ascospores show three cross-walls and in some instances a longitudinal septum develops in one of the middle cells.

The family of the Myriangiaceae may be linked with the Elsinoaceae by the genera *Agyrona* and *Anhellia* which are also leaf parasites with a well developed mycelium in the host-plant. The ascomata are erumpent and pulvinate and the ascospores typically muriform, subhyaline in *Agyrona* and brown coloured in *Anhellia*. The genus *Myriangium* which I would place next to these, is somewhat aberrant because its species parasitize scale-insects. Consequently, the mycelium is much reduced. The ascospores are subhyaline or pale coloured and muriform.

Remains the family Piedraiaceae with the only genus *Piedraia*, a parasite of the human hair. It can hardly be considered a serious parasite because the damage

it effects is very slight. The mycelium is reduced, the ascocarp pulvinate and the ascospores are one-celled and hyaline. It seems far-fetched to connect *Piedraia* with the Saccardiaceae on account of its parasitism on hairs. Perhaps there is some relation with the Atichiaceae, but without more data at hand no conclusion can be drawn at the moment.

The above suggestions on the relationships of the Myriangiales may be expressed in the following diagram. As in all other groups of Ascomycetes, such an arrangement can only be considered to be tentative and hypothetical.



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THE GENUS GLOIOCEPHALA MASSEE IN EUROPE

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(With 30 Text-figures)

A detailed study is given of *Marasmius menieri* Boudier and *M. caricis* Karsten, both of which appear to belong to the genus *Gloiocephala* Massee. The new combination *G. caricis* is made. *Marasmius menieri* sensu Corner is shown to be an undescribed species of *Gloiocephala*. The merits of the genus *Gloiocephala* are discussed.

In the dry summer of 1959, Mr. W. J. Reijnders (Hugo de Vries-Laboratorium, Amsterdam) collected in the marsh-reserve "Het Naardermeer" near Amsterdam, on old culms of *Typha*, a small, brown, conchate, gelatinous fungus with gill-like folds on the underside.

It was first thought to be a species of the genus *Campanella*. Material was sent to the specialist of that genus, Dr. R. Singer at Tucumán, Argentina, and to the Rijksherbarium at Leiden. Dr. Singer and Dr. M. A. Donk independently came to the conclusion that the species belonged to the genus *Gloiocephala* Massee. Meanwhile I had identified the species with *Marasmius menieri* Boudier.

After the publication of the very clear original description and drawings, by Boudier (*1894*: 61), only one detailed study on *M. menieri* seems to have been published, viz. by Corner (*1934*: 285). However, on comparing Corner's and Boudier's descriptions, I found several discrepancies. Fortunately Mr. E. J. H. Corner (Cambridge) was so kind as to send me some elaborate drawings of his fungus. They actually show a species quite distinct from *Marasmius menieri*, obviously also belonging to *Gloiocephala* as defined by Singer (*1960*), but differing from the species included in that genus by that author.

A further collection under the name of *Marasmius menieri*, kindly sent to me by Mr. D. A. Reid (Kew), contained still another species of *Gloiocephala*. This material turned out to be conspecific with *Marasmius caricis* P. Karst.

KEY TO THE EUROPEAN SPECIES OF GLOIOCEPHALA

1. Cap pale brown to reddish-ochraceous brown; stalk abortive, blackish; cuticle with thin-walled cells, cystidia-like, thick-walled cells, and, at least at margin, fusiform-capitate cystidia. *G. menieri*
1. Cap white to pale ochraceous; stalk well developed, entirely white or with brown base; cuticle with one kind of cells and non-capitate cystidia.
   2. Pileocystidia 32–53 × 7–15 μ, cylindrical to slender conical, with narrow but rounded apex; fold-like gills with cheilocystidia *G. caricis*
   2. Pileocystidia 50–120 × 6–18 μ, with filiform apical appendage; hymenium at best with some folds or wrinkles; cheilocystidia absent (*Marasmius menieri* sensu Corner) *G.* species

GLOIOCEPHALA MENIERI (Boud.) Sing. — FIG. 1—11

Marasmius menieri Boudier *in* Bull. Soc. mycol. France **10**: 61 *pl. 1 f. 4.* 1894. — *Gloiocephala menieri* (Boud.) Sing. *in* Sydowia **14**: 272. 1960.

Fruit-bodies very small and thin, elastic, soft, extremely eccentrically and short stipitate, appearing laterally attached in more mature specimens, on erect culms, often gregarious. Cap up to 10 mm, in very young stages convex with central stalk and slightly involute margin, soon developing asymmetrically, becoming convex conchate with straight margin, appressed to substrate near stalk, often with some radial furrows, varying in colour from very pale brownish to reddish-ochraceous brown (Séguy 191, Expo. E 36), sometimes rather spotted in old specimens, dull, minutely granular, brown punctate and with fimbriate margin under hand-lens, sometimes with more or less reticulate ridges in old specimens. Hymenium smooth at first, later on with 1–6 fold-like gills, which do not reach the margin of the cap and become more or less intervenose with age, often slightly irregularly alveolate in old specimens, especially near the stalk, white to very pale pinkish-brownish, with concolorous gill edge, which is fimbriate under hand-lens, in dried specimens brown punctate near stalk, especially on gill edges. Stalk up to 1 × 0.2 mm, equal, always horizontal and pressed against the hymenium, extremely eccentric and hardly visible in mature specimens, insititious, pale when very young, soon very dark brown, entirely concolorous pubescent under hand-lens. Context very thin, glassy, elastic. Spore print white. Smell faint. Taste not noted.

Spores 15.5–21.0 × 5.5–7.5 μ (22.0–25.0 × 4.5–6.3 μ in Orton's material) (apiculus included), fusiform, the apex rounded, the base tapering into a broad, more or less rounded, slightly bent apiculus, colourless, thin-walled, mostly with one, sometimes with several refractive droplets, neither amyloid nor pseudoamyloid. Basidia 40–60 × 9–13 μ, clavate, 4-spored, with basal clamp. Cystidia rather numerous on edges of folds and on edge of cap, scarce or lacking in hymenium. Cystidia on edges of gills 50–100 × (5–)8–12(–20) μ, slender, cylindrical, fusiform or clavate, the apex subacute to broadly rounded, often subcapitate, often with large yellow-brown apical globules, up to 30 μ across, which in NH_4OH or KOH turn dingy purplish in fresh material and olive brown in dried, sometimes with similar contents. Cystidia on edge of cap 45–70 × 8–14 μ, with 4.5–11 μ broad apex, fusiform, lageniform or subcylindrical, with slender neck and subacute apex, or with broad neck and subcapitate, seldom capitate apex often with a globule, or remnants of it, as in the cheilocystidia. Cuticle hymeniform, with pileocystidia and two kinds of cells: one 10–30(–40) × 10–20(–25) μ, vesiculose to clavate, thin-walled, colourless; the other 25–50 × 7–15(–20) μ, clavate to utriform, often irregular, with thick, 2- or 3-layered, yellow-brown to reddish brown wall, not changing colour in NH_4OH and KOH, sometimes encrusted with hyaline matter (disintegrating outer wall?); many transitions between the two types; pileocystidia abundant on outmost margin of cap and sometimes near place where cap is pressed against substrate, elsewhere scarce or even absent, 45–80 × 8.5–12 μ, the neck 3.5–7 μ broad, the apex 2–10 μ broad; fusiform, sublageniform or subcylindrical,

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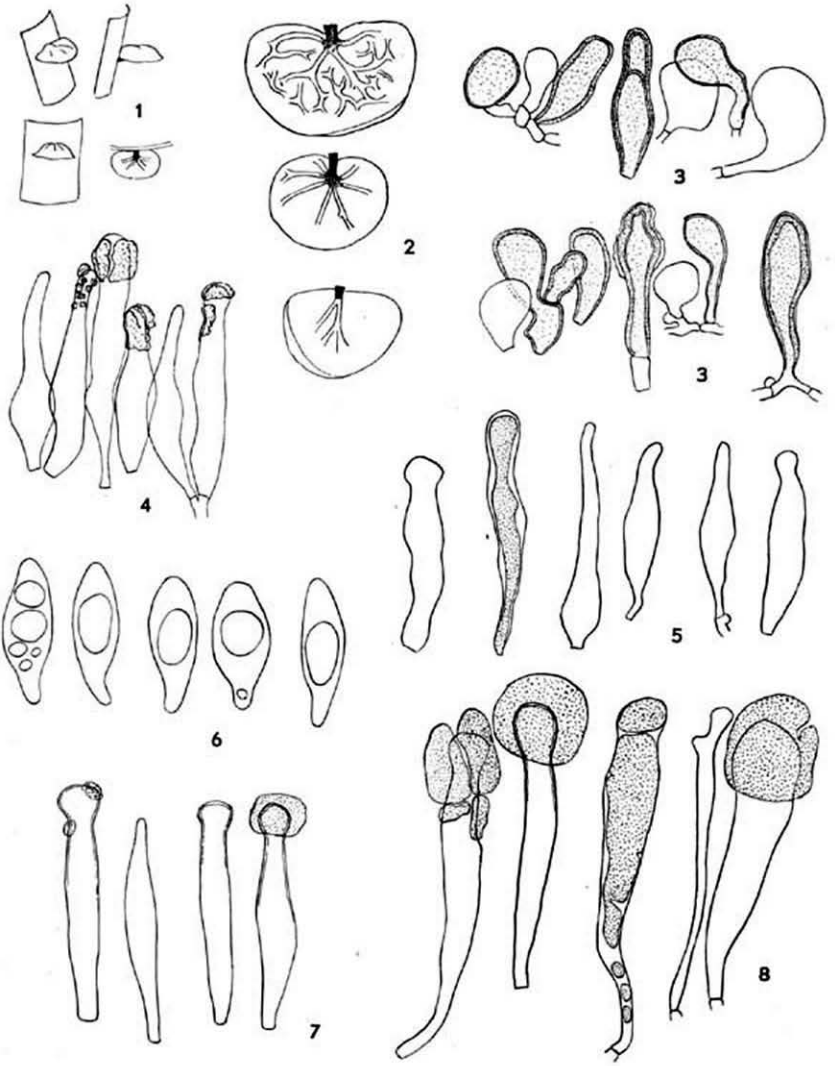
EXPLANATION OF FIGURES 1–8

Figs. 1–8. *Gloiocephala menieri* (Boud.) Sing. 1. Carpophores (× 1). 2. Carpophores seen from below (× 3). 3. Cells of cuticle (× 500). 4. Cystidia from edge of cap (× 500). 5. Pileocystidia (× 500). 6. Spores (× 1250). 7. Hymenial cystidia (× 500). 8. Cystidia from edge of fold near apex of stem. (1–8 from Bas 1757.)



Figs. 1–8

subcapitate or capitate, seldom acute, often with large yellow-brown globules, the contents hyaline or yellow-brown (globules and contents reacting with NH_4OH and KOH as in cheilocystidia), the wall slightly thickened. Caulocystidia 40–60 × 7–17 μ, 4–13 μ broad, mostly fusiform-capitate, seldom slender-fusiform with subacute apex, sometimes hyaline, often with large yellow-brown globules, mostly with yellowish brown contents (reaction of globules and contents with NH_4OH and KOH as in cheilocystidia). Trama of cap gelatinized throughout, 150–250 μ thick, of irregularly arranged, distant, 1.5–4(–6) μ wide hyphae, with some 1.5–2 μ wide hyphae running obliquely but straight from cuticle to hymenium. Trama of gills of same structure as trama of cap. Subhymenium 10–20 μ thick, made up of densely interwoven hyphae. Stalk with brown, 10–20 μ thick cortex; central part consisting of colourless, longitudinal, 1.5–10 μ wide hyphae with circa 0.5 μ thick walls, embedded in gelatinous matter, interstices 0.5–3 μ wide; cortex of several layers of 2–5 μ wide, thick-walled, brown hyphae embedded in brownish gelatinous matter, the outer hyphae obscured by pigmentation. All elements turn yellowish in Melzer's solution. In Cresyl Blue the cell walls of all elements except the spores turn purplish-pinkish, while the contents of the basidia, cystidia and the hyphae of the cap remain blue.

HABITAT.—On dead, still erect plants of *Typha angustifolia*; 0–20 cm above water level; in dense vegetation. Collected on *Carex riparia* by Orton.

DISTRIBUTION.—England, France, and the Netherlands.

SPECIMENS EXAMINED.—England: Norfolk, Surlingham, Thackmarsh, 17 July 1956, *Orton* 782 (L). Netherlands: Noord-Holland, Naardermeer, 23 Aug. 1959, *W. J. Reijnders s.n.* (L); 4 Sept. 1959, *Bas 1757* (L); 22 July 1960, *Bas 1925* (L).

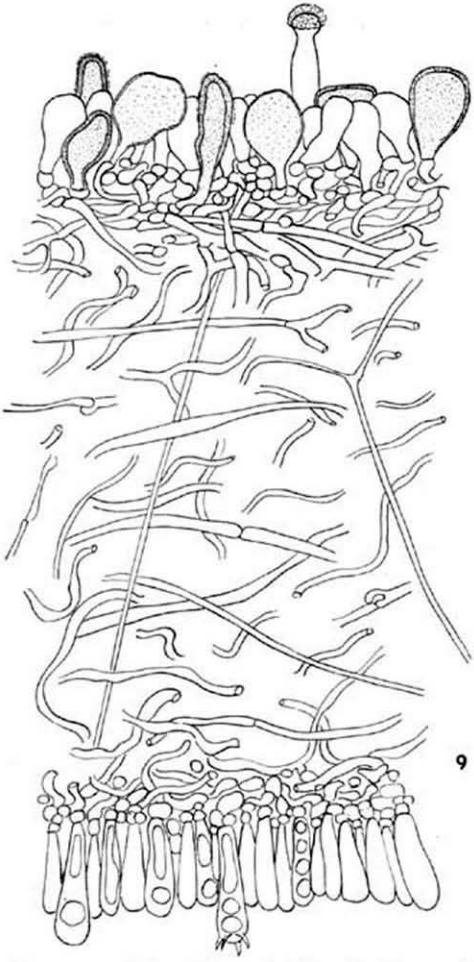
On the whole Boudier's original description and figures fit the Dutch material extremely well. There are only a few minor discrepancies. Boudier found the caulocystidia hyaline; I found most of them filled with a brown substances. Boudier saw only a gelatinous zone above the hymenium; in the material, which I studied, the whole context is gelatinous.

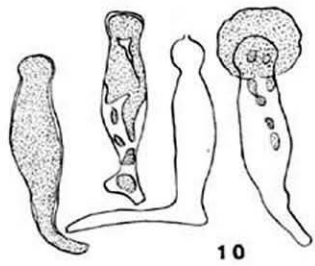
The British collection needs some comments.

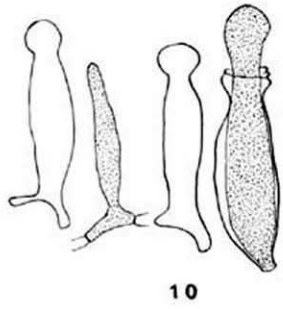
Mr. P. D. Orton kindly sent me one specimen of the few he collected. This specimen has all the essential characters of *G. menieri*; there are, however, several quantitative differences. In comparison with the Dutch material the spores of his specimen are considerably longer and more slender, 15.5–21.0 × 5.5–7.5 μ against 22–25 × 4.5–7.5 μ (in both cases spores taken from a deposit). One would be tempted to describe a variety 'macrospora', if Boudier had not given the spores as 18–25 × 5–7 μ in the original description. Orton's specimen is very pale, owing to the presence of many large thin-walled sphaerocysts and very few thick-walled cells in the cuticle; however, the pileocystidia are more numerous. It remains possible that a distinct taxon is involved, especially as it was collected on a different host.

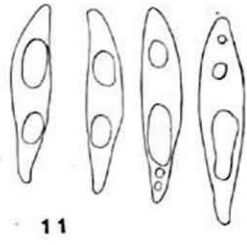
Marasmius menieri was reported once from the Netherlands, near Breda, by Schweers (*1948:* 3). However, no specimens or figures are left to substantiate this record.

Among the species of *Gloiocephala* described by Singer in his recent monograph (*1960:* 262–272), *G. palmarum* Sing. is the one most closely related. It resembles *G. menieri* in the pigmented cap, the short eccentric stalk, the gelatinous context









Figs. 9–11. *Gloiocephala menieri* (Boud.) Sing. 9. Radial section of cap (× 500). 10. Caulocystidia (× 500). 11. Spores (× 1250). (9–10 from Bas 1757, 11 from Orton 782.)

and the presence of three kinds of elements in the cuticle. However, the form of these elements is different, e.g. the large cystidia on the cap of *G. menieri* are thin-walled and mostly fusiform-capitate while those of *G. palmarum* are thick-walled [1] and lageniform.

[1] In my opinion the use of the term metuloids for cystidia so unlike the metuloids in their original sense, e.g. the cystidia of *Peniophora* and *Hohenbuehela*, is rather misleading.

Gloiocephala caricis (P. Karst.) Bas, *comb. nov.* — FIG. 12—25.

Marasmius caricis P. Karst. *in* Bidr. Finl. Nat. Folk **25**: 231. 1876. — *Androsaceus caricis* (P. Karst.) P. Karst. *in* Bidr. Finl. Nat. Folk **32**: 174. 1879.

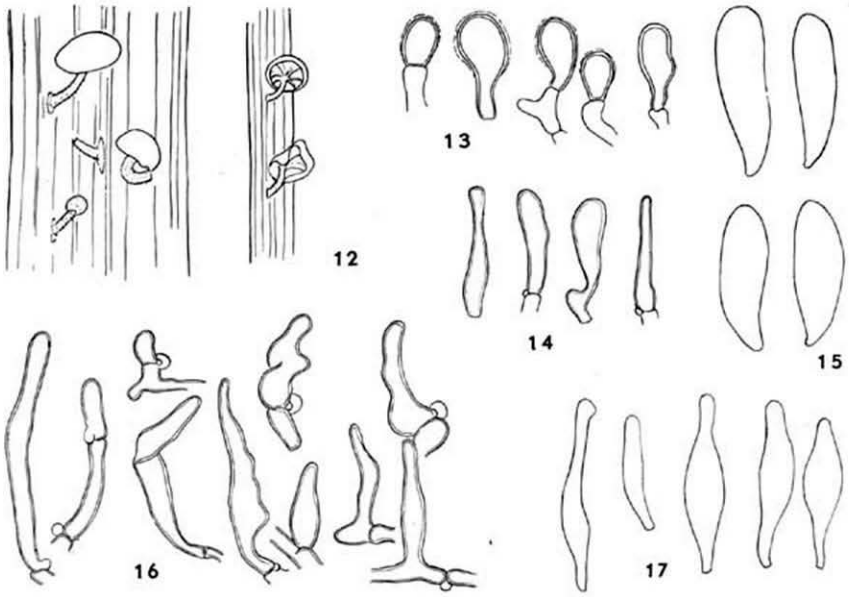
Fruit-bodies very small, gregarious on putrescent leaves of *Carex*. Cap (1.5–)2–4(–5) mm across, convex with margin slightly inflexed at first, then plano-convex, circular when young, sometimes slightly elongated when old, white to pale ochraceous with whitish margin, puberulous under hand-lens, smooth, sometimes slightly wrinkled at margin when fresh, dull. Gills 3–6(–10), very distant, rather narrow and thick, more or less fold-like, straight, very seldom forked, radial, reaching margin of cap, white (yellow in the dried type-material), with fimbriate edge under hand-lens. Stalk 1.5–4 × 0.1–0.3 mm, equal or slightly attenuated upwards, curved sideways, insititious, sometimes with slightly bulbous or disk-shaped base, central at first, then eccentric, white at apex, whitish to pale brown at base, densely puberulous, sometimes minutely villose at base. Flesh white, somewhat hyaline over hymenium, rather firm, comparatively thick in cap, up to 0.5 mm.

Spores (14.5–)17.7–21.5(–24.4) × (4.5–)5.3–6.3(–7.2) μ (inclusive of apiculus), slender-clavate to oblong-ellipsoid, with broadly rounded apex and tapering, slightly curved base, tapering into a rather small apiculus, colourless, rather thin-walled, with several oil-like droplets. Basidia 28–40(–50) × 8–11 μ, as a rule 2-spored (in two cases a small third sterigma was observed), clavate, with basal clamp. Cheilocystidia occurring mixed with basidia, 25–58 × 7–12 μ, fusiform to ventricose-fusiform, neck often elongated and 2.7–3.6 μ wide, the apex narrow but rounded, sometimes subcapitate and then 3.6–5 μ broad, often somewhat encrusted with hyaline matter, the wall slightly thickened, the base often rather broad and with clamp. Pleurocystidia 30–42 × 9–12 μ, fusiform, the apex 4–4.5 μ wide and rounded, with slightly thickened wall, colourless, easily overlooked. Cuticle irregularly hymeniform with scattered cystidia, made up of colourless to pale yellow, lozenge-shaped to clavate cells, 10–44 × (7–)11–15 μ, with thick more or less gelatinizing outer wall and rather thick inner wall which is metachromatic in Cresyl Blue, interstices much narrower than diameter of cells and filled with gelatinous matter. Pileocystidia 30–53 × 6–11.5 μ, cylindrical to very slender conical, sometimes fusiform, broad at base, originating from same parent hyphae as cells of cuticle, apex narrow but rounded, 2.7–5.4 μ wide; with basal clamps; wall slightly thickened, colourless. Caulocystidia up to 80 × 10 μ, very variable, e.g. (1) cystidia similar to the pileocystidia; (2) cylindrical, septate, sometimes subcapitate hairs; and (3) short projections of superficial hyphae; all possible transitions between these three types present; walls slightly thickened. Trama of stalk made up of longitudinal, thick-walled hyphae, embedded in a gelatinous matter; hyphae 3–9 μ wide; narrow and close together near surface, increasing in diameter towards centre, with the interstices becoming more distinct, but these not wider than diameter of hyphae and filled up with gelatinous substance. Trama of cap consisting of irregularly arranged, 5–10 μ wide hyphae with thick walls, not embedded. Trama of gills irregular to somewhat regular, composed of 3–7 μ wide hyphae, embedded in a gelatinous matter, the interstices on an average about as wide as the hyphae; with a thin, about 10 μ wide, densely ramose subhymenial layer. Clamps present. All elements pale yellowish in Melzer's solution. Inner walls of cells of cuticle and of hyphae of stalk slightly metachromatic in Cresyl Blue.

HABITAT.—In swamps, on putrescent leaves and culms of species of *Carex*, viz. *C. vesicaria* (coll. Karsten) and *C. rostrata* (coll. Reid).

DISTRIBUTION.—Finland and Scotland, probably also in the Netherlands.

SPECIMENS EXAMINED.—F i n l a n d: Tavastia australis, Mustiala, 30 Sept. 1870,



Figs. 12–17. *Gloiocephala caricis* (P. Karst.) Bas. 12. Carpophores (× 5). 13. Cells of cuticle (× 500). 14. Pileocystidia (× 500). 16. Caulocystidia (× 500). 17. Cheilocystidia. (12–17 from type.)

P. A. Karsten s.n., type (H). Scotland: Inverness-shire, Lily Pond, between Rothiemurchus and Loch an Eilean, 16 July 1957, *D. A. Reid & P. M. Reid s.n.* (K).

Mr. W. J. Reijnders (Amsterdam) showed me his notes and drawings of a species of *Marasmius*, collected on *Phragmites* in the Naardermeer near Amsterdam, 1 November 1952, very similar to *G. caricis*. The macroscopical description entirely matched this species, and the notes on the microscopical features, although rather brief, comprised no facts that would preclude the identity with *G. caricis*. However, as no material is available, the occurrence of *G. caricis* in the Netherlands has still to be definitely demonstrated.

All elements of *G. caricis*, except the cystidia, basidia and spores, have a wall consisting of two rather thick layers, the outer one of which has a tendency to gelatinize; its outline fades in NH_4OH and KOH. Where the elements are rather close together, as in the stalk, the trama of the gills and the cuticle, the intercellular space is filled up with gelatinous matter. Only in the upper part of the trama of the cap and in the hymenium are the elements not agglutinated.

According to Singer, the present species has to be placed in *Gloiocephala* on account of the gelatinizing hyphae in the trama of the cap. See further the discussion below.

Among the species of *Gloiocephala* described by Singer (1960), especially *G. inobasis* Sing. and *G. confusa* Sing. bear a certain resemblance to the present species. The hymenial cystidia of these two species are, however, completely different from those of *G. caricis*.

Still another small, white agaric, growing on *Carex*, has to be taken into consideration in this connection, viz. *Agaricus caricicola* Lasch (*1828*: 391). No original material seems to be available. Lange (*1936*: 63) placed this taxon as a variety under *Omphalia integrella* (Pers. ex Fr.) Kummer. This in accordance with Fries's suggestion in the general index of the "Systema Mycologicum" (*1832*: 11). Cejp (*1938*: 139) put *A. caricicola* in the synonymy of *Delicatula hirsuta* (Tode) Cejp, together with *Androsaceus ca icis* (P. Karst.) P. Karst.

There is a great similarity between the original descriptions of *Agaricus caricicola* Lasch and *Marasmius caricis* P. Karst. However, the original description of the gills of *Agaricus caricicola* makes it very plausible that Lasch's species belongs to the genus *Delicatula* sensu Kôhner & Romagnesi.

As Kühner (*1938*: 666) pointed out, it is not probable that *Agaricus caricicola* sensu E. J. Lange is conspecific with *Delicatula integrella*, as Lange mentioned the presence of cystidia; it is closer to *D. delectabilis* (Peck) Kühner & Romagn.

Another species which bears a great resemblance to *Marasmius caricis* P. Karst. is *M. caricicola* Kauffman apud Murrill & Pennington (*1915*: 277).

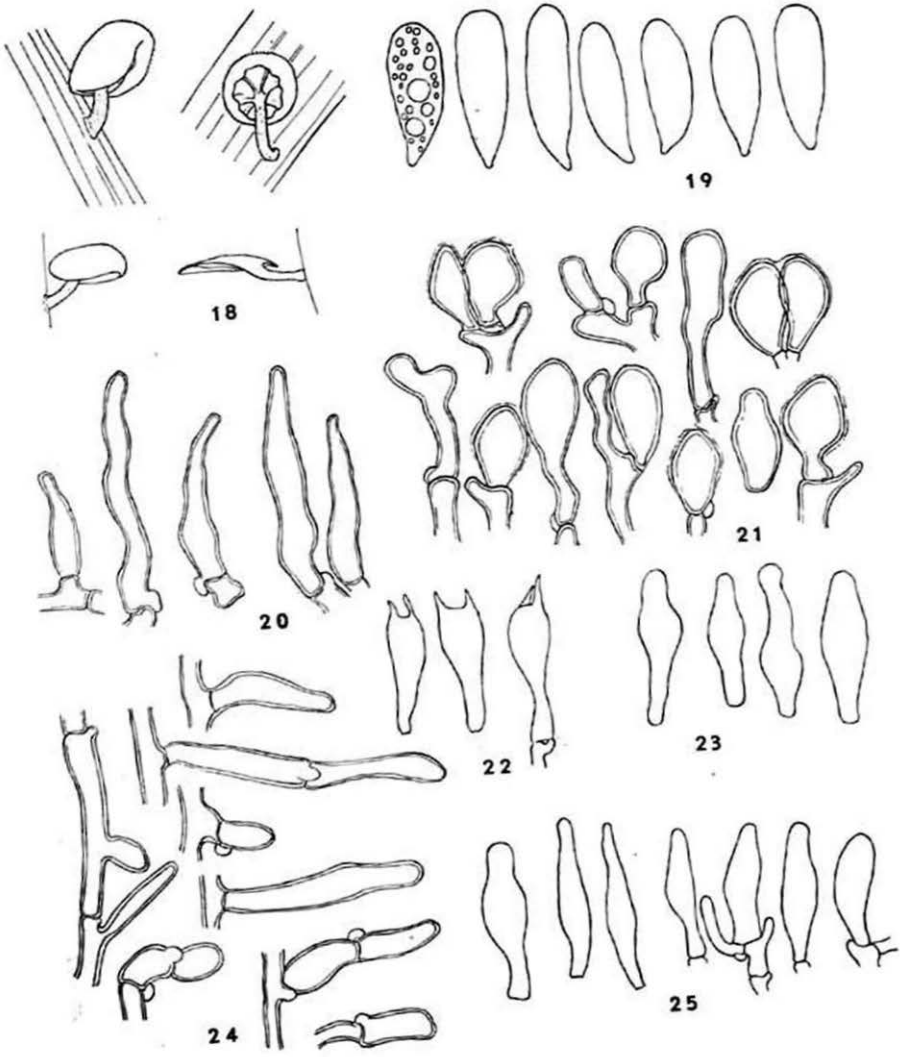
According to Kauffman's rather detailed description (*1918*: 74) *M. caricicola* differs from *M. caricis* in the broadly radially sulcate or alveolate surface of the cap, the rather broad gills, the subglabrous stalk, and the larger size (cap 4–8 mm across, stalk up to 0.7 mm thick).

By the kindness of Dr. A. H. Smith (Ann Arbor) I was able to study authentic material of *M. caricicola* Kauffm. (Whitmore Lake, Horshoe Lake and Mud Lake, Michigan, 12 Nov. 1910; probably erroneously labelled as the type). Unfortunately this material is in a very bad condition and it appeared impossible to check Kauffman's statement that the cuticle consisted of globose hyaline cells. I found one ellipsoid spore, 19.6 × 7.9 μ; one fusiform subcapitate (cheilo-?)cystidium, about 50 × 14 μ; some hairlike caulocystidia; clamped hyphae; no gelatinous tissue in the cap; no amyloid or pseudoamyloid elements; thick-walled hyphae in the stalk, which were metachromatic in Cresyl Blue.

On account of these perhaps still insufficient facts this species has to be placed in section *Epiphylli* of the genus *Marasmius*. But the possibility still remains that it will turn out to be a species of *Marasmiellus* when the exact structure of the cuticle will be known.

EXPLANATION OF FIGURES 18–25

Figs. 18–25. *Gloiocephala caricis* (P. Karst.) Bas. 18. Carpophores (× 5). 19. Spores (× 1250). 20. Pileocystidia (× 500). 21. Cells of cuticle (× 500). 22. Basidia (× 500). 23. Pleurocystidia (× 500). 24. Caulocystidia (× 500). 25. Cheilocystidia (× 500). (18–25 from Reid & Reid 16 VII 1957.)



Figs. 18–25

GLOIOCEPHALA species — FIG. 26—30

Marasmius menieri Boud. *sensu* Corner *in* Trans. Brit. mycol. Soc. **19**: 285. 1934.

Cap 2–6 mm across, 120–250 μ thick, convex then plane, sometimes subconcave, rarely umbonate, circular to almost spathulate, puberulous, even or subreticulate, not striate, white to pale yellowish or brownish; margin straight at first, often becoming slightly inflexed. Stalk 2–10 × 0.15–0.8 mm, attenuate upwards, with slightly bulbous base, central or slightly eccentric, generally more or less horizontal and pressed against the hymenium, rarely vertical, white at apex, ferruginous downwards, dark brown or black at base, puberulous below, glabrous above. Hymenium plane or with a few shallow folds or wrinkles, white or cream-coloured. Flesh pallid, slightly gelatinous over hymenium.

Spores 13–23 × 4–5.5 μ, fusiform pip-shaped, thin-walled, clouded vacuolate. Basidia 40–55 × 9–11 μ, 4-spored, seldom 2-spored; sterigmata 4–5 μ long. Hymenial cystidia absent. Cuticle consisting of clavate, pale yellowish brown cells, 25–80 × 12–30 μ, with slightly thickened walls, often more or less encrusted, mixed with numerous, colourless, thin-walled, smooth, ventricose pileocystidia with 1.5–2.5 μ wide, filiform appendages, 50–120 × 6–18 μ. Caulocystidia of two kinds, either ventricose to subtriangulair with filiform apex, or irregularly cylindrical to clavate, 30–70 × 5–20 μ, with dark brown walls. Trama of cap according to description partly gelatinized; according to drawing entirely gelatinized. Clamps present.

HABITAT.—In fens, on decayed leaves of *Cladium mariscus* and *Typha*, July–Oct.

DISTRIBUTION.—England.

SPECIMENS EXAMINED.—No material available. Description copied from Corner's publication. Figures copied from Corner's original drawings.

None of the species in Singer's publication on *Gloiocephala* (*1960*) appears closely related. In the species with hair-like pileocystidia these are thick-walled and always combined with smaller spores.

I have refrained from naming this presumably new species, as no material is available. No doubt this species will be found again when looked for in the proper places. Corner stated it to be common in the fens in Cambridgeshire, England.

According to Singer, this species is to be placed in *Gloiocephala* on account of the long, hair-like dermatocystidia and the gelatinizing trama of the cap.

Singer (*1960*: 261) placed in the genus *Gloiocephala* all species differing from those of the section *Epiphylli* of the genus *Marasmius* by one or more or the following features: (1) characteristic dermatocystidia, viz. cystidia which are large, or thick-walled, or pseudoamyloid, or capitate to subcapitate; (2) hymenial cystidia, which are not thin-walled and fusiform; (3) basal fibrils; (4) spathulate carpophores; (5) pigmented caps; (6) gelatinous tissue in the trama of the cap.

Especially in the case of *Gloiocephala caricis*, I cannot help wonderring at the

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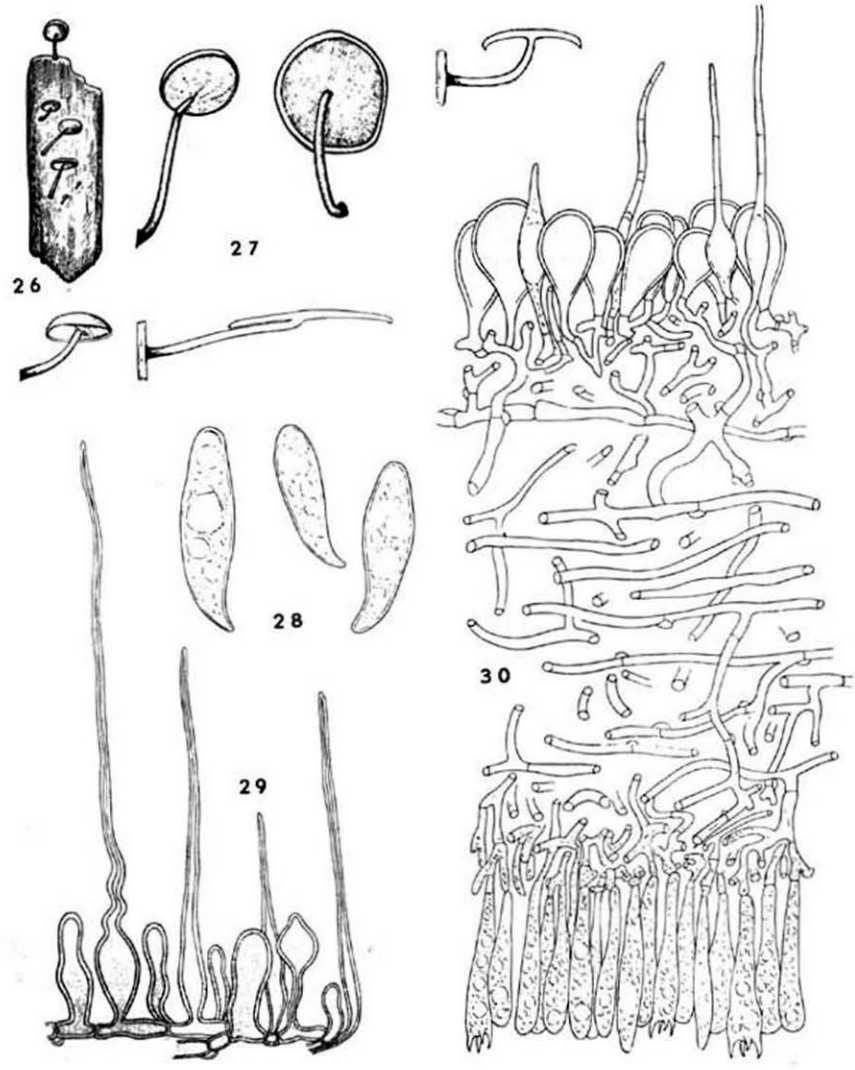
EXPLANATION OF FIGURES 26–30

Figs. 26–30. *Gloiocephala* sp. 26. Carpophores (× 1). 27. Carpophores (× 5). 28. Spores (× 1250). 29. Caulocystidia (× 500). 30. Section of cap (× 500). (After Corner's original drawings.)



Figs. 26–30

merits of the genus *Gloiocephala* as interpreted by Singer. In that species only one of the characters enumerated above is present, viz. the gelatinized trama of the cap, whereas in other respects *G. caricis* is very similar to *Marasmius epiphyllus*. In both species the cuticle consists of thin-walled, rather small more or less fusiform pileocystidia and vesiculose cells with a gelatinizing outer wall, on account of which the cells are embedded.

Cystidia play a prominent part in Singer's delimitation of *Gloiocephala*. It seems worth while to stress the fact that pileocystidia are rather frequent in the sections *Hygrometrici* and *Epiphylli* of *Marasmius*.[1] The pileocystidia in these sections may be (1) thick-walled and hair-like, as in *M. hudsoni* (Pers. ex Fr.) Fr. (see Patouillard *1883*: 149 *pl. 108 f. 327*); (2) rather thick-walled and fusiform subcapitate, as in *M. buxi* Quél. (see Favre *1933*: 8 *f.* 1; this species has a remarkable tendency to reduction of the hymenophore); (3) small, thin-walled, subcylindrical to ventricose in *M. epiphyllus* (Pers. ex Fr.) Fr. (Bas 1647); (4) large, slightly thick-walled and lageniform-subcapitate in M. epiphylloides Rea (Bas 1190); (5) medium, clavate-fusiform, thin-walled and heavily encrusted in *M. recubans* Quél. (Bas 1318). The question now arises whether or not these pileocystidia in the species mentioned above are fundamentally different from those occurring in species of *Gloiocephala*.

In the species placed in *Gloiocephala* by Singer, two types of characteristic cystidia may be distinguished. One is thick-walled and ventricose with a hair-like elongated neck; the other, fusiform-ventricose and capitate or subcapitate, mostly thin-walled and often encrusted.

In connection with the first type, the caulo- and pileocystidia of the unnamed species of *Gloiocephala* described above are very interesting. The pileocystidia of this species are thin-walled, ventricose-fusiform with an elongated hair-like neck (fig. 30). Especially the short ones among them bear a great resemblance to the pileocystidia of *Marasmius epiphyllus*, whilst the hair-like caulocystidia which resemble the pileocystidia but have thickened walls (fig. 29) are quite similar to the pileocystidia of, for instance, *G. longifimbriata* Sing. Thus, in the unnamed species of *Gloiocephala* transitions can be found between the dermatocystidia of the *Marasmius epiphyllus* type and the dermatocystidia of the first type in *Gloiocephala*.

The second type of cystidia in *Gloiocephala* occurs in *G. menieri* in its extreme form, viz. capitate fusiform-ventricose with a brown apical incrustation. However, at the margin of the cap of *G. menieri* (fig. 4) one will find all transitions from fusiform cystidia to the second type of cystidia in *Gloiocephala*.

In my opinion the two kinds of characteristic cystidia occurring in *Gloiocephala* are not only homologous to each other but also to the less conspicuous cystidia in *Marasmius epiphyllus*.

In this paper I have treated the genus *Gloiocephala* entirely in accordance with the formula given by Singer. In this way, two species have inevitably been introduced

[1] This is in opposition to Singer's statement (*1951*: 321) "... epicutis of the pileus consisting of irregular ... or hymeniformly arranged elements or an epithelium, but among these elements no differentiated hairs or dermatocystidia projecting ..."

which seem to represent important bridging elements between *Marasmius* and *Gloiocephala*.

There exists at the boundary of the genus *Marasmius*, a group of species in which reduction of the hymenophore is associated with a tendency to differentiation of the cystidia, formation of gelatinized tissue in the cap, and eccentric attachment and reduction of the stipe. I am afraid, however, that it will not be possible to maintain this group as a separate genus.

Grateful acknowledgements are expressed to the Director of the Botanical Museum at Helsinki, to the Director of the Herbarium of the Royal Botanic Gardens at Kew, and to the Director of the University Herbarium at Ann Arbor for sending on loan valuable material.

Thanks are also due to Mr. E. J. H. Corner F.R.S. (Cambridge), who placed some drawings at my disposal, to Mr. P. D. Orton (Reading), who sent material, to Mr. D. A. Reid (Kew), who procured material and annotations, and to Mr. W. J. Reijnders (Amsterdam) who supplied material, drawings and annotations.

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SUR TROIS PSILOCYBE

Par H. S. C. HUIJSMAN (*)
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(Avec 14 figures dans le texte)

Description de *Psilocybe callosa* (Fr. per Fr.) Quél., espèce oubliée et mal connue, et de deux espèces nouvelles.

PSILOCYBE CALLOSA (Fr. per Fr.) Quél.—FIGS. 1–5

Agaricus callosus Fr., Observ. mycol. **2**: 180. 1818. — *Agaricus callosus* Fr. *per* Fr., Syst. mycol. **1**: 292. 1821. — *Coprinarius callosus* (Fr. per Fr.) Kumm., Führ. Pilzk. 69, 1871. — *Psilocybe callosa* ("*callosus*") (Fr. per Fr.) Quél. *in* Mém. Soc. Emul. Montbéliard, 2e Série, **5**: 257. 1872. — *Geophila callosa* (Fr. per Fr.) Quél., Ench. Fung. 115. 1886.

Chapeau 14–25 mm, obtusément conique ou convexe, généralement avec un mamelon saillant, non hygrophane, à revêtement subvisqueux, à faible structure radiaire, parfois gercé ou subrimeux, jaune paille assez pâle (vers Expo. A72, 74), plus foncé au centre (Expo. A76), souvent avec des débris vélaires jaunâtres en petits lambeaux pelucheux à la marge droite. Lames assez espacées, 22–29 lamelles, lamellules de 1 ou 2 longueurs, larges et largement arrondies- ou subémarginées-adnées, à arête concolore et subhorizontale, gris-violacé peu foncé (vers Expo. D41). Pied 40–70 × 1,5–2,5 mm, subflexueux, devenant fistuleux, lentement aminci de haut en bas, subradicant, à partie enfoncée velue-strigueuse et fauvâtre, chatoyant, pruineux au sommet, aranéo-fibrilleux vers la base, jaunâtre pâle (± Expo. A72). Chair épaisse et blanche dans le centre du chapeau, concolore à la surface à l'extérieur du pied, sauf à l'insertion des lamelles où la couleur est franchement olivâtre, lavée de fauve-olivâtre à l'intérieur du pied; odeur et saveur insignifiantes. Sporée noirâtre-pourpré, presque noire. Spores 10–12 × 6,2–7,8 μ, elliptiques, violacé pâle sous le microscope, à paroi assez épaisse, assez transparantes, à grand pore souvent un peu oblique. Basides 26–33 × 10–12,5 μ, bouclées à leur base, tétrasporiques, subclaviformes ou faiblement élargies vers leur sommet. Arête des lamelles subhétéromorphe (avec quelques basides dispersées entre les cystides). Cheilocystides 22–46(–54) × 7–10 × 3–4 μ, ventrues dans leur moitié proximale, à col cylindrique ou un peu rétréci vers le sommet obtus. Pleurocystides ou chrysocystides absentes. Epicutis mince, à hyphes couchées d'un diamètre de 1,5–2 μ, emmêlées, légèrement gélifiées. Hypoderme non subparenchymateux, à hyphes larges, radiales, d'un diamètre de 12–36 μ. Chair à hyphes vasiformes assez fréquentes. Caulocystides ressemblant aux cheilocystides, mais de forme plus variable. Boucles nombreuses.

En quantité dans un champ inculte à Nans-les-Pins (Var, France); le 28 septembre 1960, leg. H. S. C. Huijsman (L).

J'attribue le champignon de Nans-les-Pins à l'*Agaricus callosus*, telle que cette espèce a été décrite par Fries dans Observationes mycologicae (l.c.). La description

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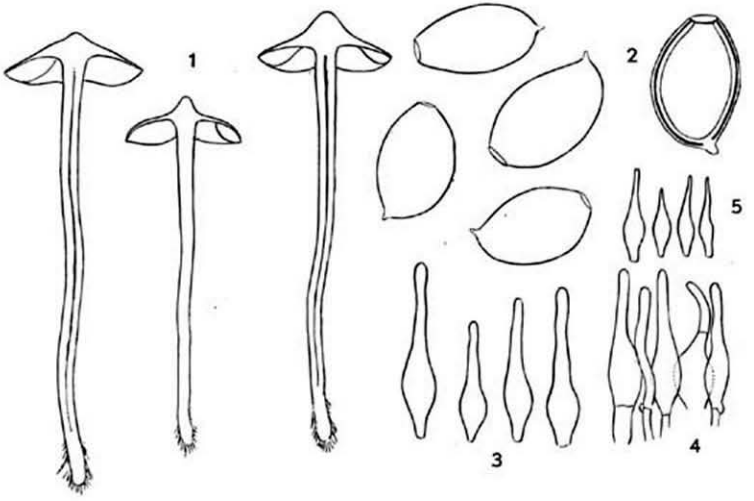


Figs. 1–5. — 1–4. *Psilocybe callosa* (Fr. per Fr.) Quél. 1. Section médiane de trois carpophores (× 1). 2. Cinq spores (× 1540). 3. Cheilocystides (× 500). 4. Caulocystides (× 500). — 5. *Psilocybe semilanceata*. Cheilocystides (× 500; à titre de comparaison).

friésienne dans Systema mycologicum (l.c.) est collective et renferme, en outre, *A. semilanceatus* Fr. per Secr., traité séparément par cet auteur dans Epicrisis 230–231. 1838 (comme, d'ailleurs, dans Obs. myc.). Il est probable que Quélet (meilleure description: Fl. mycol. 65. 1888) a eu en mains la même espèce. Une description moderne m'en est inconnue.

Je profite de l'occasion pour appuyer sur le fait qu'il ne faudrait jamais négliger de consulter Observationes de Fries dans tous les cas où cet auteur s'y réfère dans Systema. Très souvent Observationes donne nombre de détails qui sont laissés dans l'obscurité dans les diagnoses trop serrées de Systema. On peut dire que Observationes est à Systema ce que Monographia de Fries est à Hymenomycetes europaei.

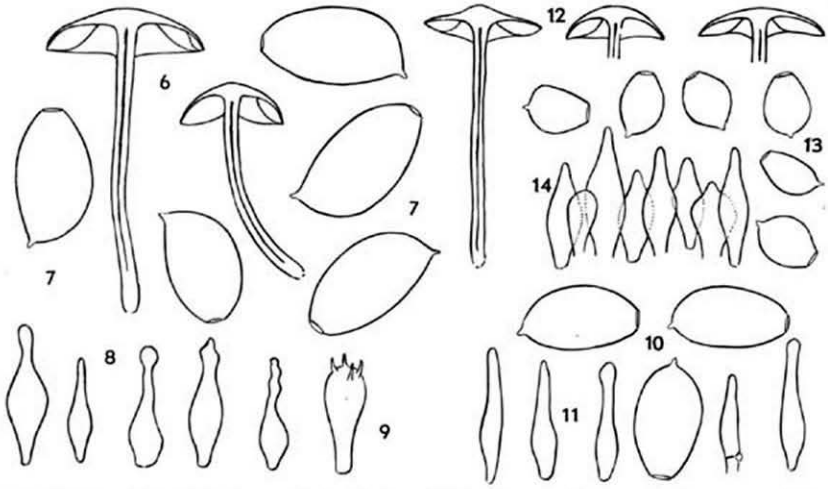
Psilocybe callosa est très proche de *P. semilanceata* (Fr. per Secr.) Kumm. mais s'en écarte au premier coup d'oeil par la forme du chapeau, non élevée-conique et non pointue, par sa couleur plus pâle et par ses lamelles plus larges, plus largement adnées et non ascendentes. Sous le microscope *P. callosa* se sépare de l'autre par les spores un peu plus courtes et surtout par les cheilocystides beaucoup plus grandes et à col cylindrique ou subcylindrique, tandis que le col de ces organes de *P. semilanceata* s'atténue progressivement vers le sommet (fig. 5).

Psilocybe merdicola Huijsm., *spec. nov.*—FIGS. 6–11

? *Stropharia merdaria* f. *macrospora* F. H. Möll., Fungi Faeröes 1: 195 *fig. 88A.* 1945.

Psilocybae merdariae peraffinis, differt absentia reliquarum veli ad stipitem, sporis majoribus, cheilocystidiis obesioribus ad basin. In sterquilinis. Typus in Herb. Lugd. Batav. (L 958. 91–256).

Chapeau 12–30 mm, hémisphérique-convexe, faiblement campanulé-convexe ou plan-convexe, subhygrophane, par exception strié à la marge brun-ocracé-olivacé sale par l'humidité (Expo. D86, ou même E83, au centre; D 84, ou encore plus foncé vers la marge), par le sec beige-alutacé ou beige-alutacé-brunâtre, nuancé de jaune dans la région discale, souvent aréolé-crevassé ou aréolé-rivuleux, parfois cerné à l'extrême bord de vestiges d'une voile blanc. Lames peu serrées, lamelles 18–30, lamellules de 2 ou 3 longueurs, assez larges et largement adnées, parfois à dent subdécurrente, d'abord beige-brunâtre, bientôt brun-purpurin, puis devenant purpurin-noirâtre (Expo. E62, puis vers H62, 63); arête finement crénelée et blanche. Pied 20–45 × 1,5–3 mm, égal, subcylindrique, parfois bulbilleux à la base, farci puis creux, fibrilleux-subtomenteux, à sommet pruineux-pulvérulent, sans trace d'une formation annulaire, crème, crème-alutacé, devenant brun sale vers la base. Chair moyennement épaisse dans le chapeau, subconcolore, pâlissant par le sec; odeur faible, mal définissable. Sporée noir-purpurin. Spores 12,8–15,8(–17,2) × 7,8–9,3 μ, ellipsoïdes ou parfois faiblement citriformes, à pore net, non opaques, brun violacé peu foncé sous le microscope. Cheilocystides nombreuses, 25–43 × 7–11,5 μ, hyalines, sublagéniformes, ventrues en bas, à col peu



Figs. 6–14. — 6–9. *Psilocybe merdicola* Huijsm. 6. Sections médianes de deux carpophores (× 1). 7. Cinq spores (× 1540). 8. Cheilocystides (× 500). 9. Un basidium (× 500). — 10–11. *Psilocybe merdaria* (à titre de comparaison). 10. Trois spores (× 1540). 11. Cheilocystides (× 500). — 12–14. *Psilocybe xeroderma* Huijsm. 12. Trois sections médianes (× 1). 13. Six spores (× 1540). 14. Cheilocystides (× 500).

allongé, souvent capitulé ou clavulé au sommet. Pleurocystides ou chrysocystides absentes. Basides tétrasporiques, subclaviformes, 28–34 × 10,5–13 μ. Trame des lamelles subrégulière. Epicutis d'une épaisseur de 50–70 μ, à hyphes étroites, subhorizontales et noyées dans un mucilage, reposant sur un emmêlement d'hyphes aérifères d'un diamètre d'environ 9 μ. Boucles peu nombreuses.

Commun en été dans le Jura neuchâtelois à une altitude d'environ 1000 m; sur les vieux crottins de cheval, les excréments desséchés, etc.; le 1 juin 1959, leg. F. Marti et H. S. C. Huijsman aux Bayards (Canton de Neuchâtel, Suisse) (type: L 958.91–256), retrouvé par l'auteur dans le même canton dans plusieurs localités.

C'est seulement dans les jeunes primordiums, au chapeau dépassant à peine un diamètre d'un millimètre, que l'on trouve encore le bord piléique réuni au pied par un voile ténu. Peu après, dès que le chapeau commence à s'étaler, il se produit une rupture circulaire à l'attache du voile au pied, si bien que le bord du chapeau emporte les pauvres débris vélaires sont le pied reste totalement dépourvu. C'est justement le manque complet de vestiges vélaires au stipe qui me retient, au moins provisoirement, de considérer *Stropharia merdaria* f. *macrospora* F. H. Möll. (l.c.) comme synonyme de *P. merdicola*.

En dehors du faible développement du voile, *Psilocybe merdicola* se distingue de *P. merdaria* par les spores constamment plus grandes et par les cheilocystides plus ventrues dans leur moitié proximale.

Möller affirme qu'il n'a jamais trouvé "this large-spored form" au Danemark. J'ai fait la même constatation pour la Hollande. Tout le matériel hollandais examiné, frais ou sec, appartient à *P. merdaria*, aux spores relativement petites (p. ex. 10,7–12,4 × 6,5–7,5 μ) et aux cheilocystides peu ventrues.

La planche de *Stropharia merdaria* (Fr.) Quél. dans Konrad & Maublanc (Ic. sel. Fung. *pl. 54 fig.* 2. 1930) représente bien, au moins en plus grande partie, *P. merdicola*. Sans doute, la plupart des zones annulaires ont été ajoutées après l'achèvement du dessin. Aussi, les mesures sporiques trouvées par Konrad (12–13 × 7.5–9 μ), s'accordent mieux avec celles de *P. merdicola* qu'avec celles de *P. merdaria*.

On peut facilement confondre *P. merdicola* et *P. coprophila* (Bull. per Fr.) Kumm. La couleur du chapeau du premier tire plutôt sur l'olivâtre, celle de l'autre plutôt sur le brun rougeâtre. Sous le microscope les spores de *P. coprophila*, même du matériel sec, ont plus de violet que les spores de *P. merdicola* et elles sont beaucoup plus opaques, ce qui est dû à leur contenu très émulsionné (à vérifier encore pour les spores fraîches). Enfin, *P. coprophila* est le seul *Psilocybe* européen à pleurocystides que je ne connaisse. Celles-ci, souvent couronnées d'une guttule figée, sont peu saillantes et dépassent à peine le niveau supérieur des basides.

Psilocybe xeroderma Huijsm., *spec. nov.*—FIGS. 10–12

Psilocybe subgeneris *Deconicae*, pileo sicco vel humido, rufo-brunneo, hygrophano, ad marginem leviter striato, caccaino; vestigiis veli albi sparsis ad stipitem et marginem pilei; stipite nequaquam brevissimo; sporis in cumulo purpureo-nigris, parvis, 5,4–7,2(–7,8) × 4,3—5,4 × 3,6–4,8 μ, poro lato; cheilocystidiis relative ventricosis, ventre 7–12(–15) μ lato. In humo mixto composito. Typus in Herb. Lugd. Batav. (L 956.110–431).

Chapeau 5–20 mm, convexe, plan-convexe ou très obtusément conique, hygrophane, sec ou humide, strié à la marge, d'un beau brun-rougeâtre ou brun-chocolat (vers Expo. H32, F32), pâlissant à partir du centre et devenant brun-alutacé-ocracé, avec des fibrilles vélaires blanches, soyeuses et fugaces à la circonférence. Lames subserrées, 22–30 lamelles, lamellules généralement de deux longueurs, arquées-subdécurrentes, fauve ou chocolat; arête crénelée-denticulée et plus pâle. Pied 15–40 × 1–2 mm, subflexueux, plein ou fistuleux, subégal, parfois légèrement feutré-tomenteux à la base, vaguement floculeux-pruineux au sommet, avec des débris fugaces et blancs du voile, miel fauvâtre ou fauvâtre au sommet, plus foncé vers la base qui devient très obscure (Expo. H34, 32, J32) par le froissement ou avec l'âge. Chair assez épaisse et paille sale dans le chapeau, subconcolore dans le pied; odeur et saveur subnulles. Sporée pourpre-noirâtre. Spores 5,4–7,2(–7,8) × 4,3–5,4 × 3,6–4,8 μ, submitriformes, à pore large, à paroi assez épaisse, assez claires sous le microscope. Basides 16–23 × 5–7 μ, tétrasporiques, subclaviformes, parfois à base subventrue. Cheilocystides nombreuses et rendant l'arête stérile, 24–35(–40) × (5–)8–12 μ, subfusiformes ou sublagéniformes, franchement ventrues, à bec court, parfois piriformes ou vésiculeuses et pouvant atteindre alors un diamètre de 15 μ. Pleurocystides absentes. Trame des lamelles brunâtre, régulière, à hyphes larges, pouvant atteindre un diamètre de 20 μ. Epicutis en réseau mince à larges ouvertures, à mailles, épaisses de 10–20 μ, constituées d'hyphes accolées, à peine subgélifiées, incrustées, bouclées, d'un diamètre de 3–5 μ; le tout reposant sur des hyphes emmêlées d'un diamètre de 7–14 μ.

Subcespiteux ou subisolé sur un terreau généralement composé de toutes sortes de débris végétaux, dans les clairières et aux lisières des bois de Conifères mêlés d'essences feuillues. Assez commun dans la région jurassienne, mais toujours en petit nombre. Lougres (près de Montbéliard, Doubs, France), le 19 juin 1956 (type; L 956.110–431), forme subcespiteuse sous les pins de «La Perche», leg. H. S. C. Huijsman. Environs d'Oyonnax (Ain, France), de Neuchâtel (Suisse), etc.

Parmi toutes les espèces de *Psilocybe* indéterminables qui appartiennent au sous-genre *Deconica*, c'est *Psilocybe xeroderma* que j'ai rencontré le plus souvent et dont j'ai fait le plus de descriptions. *Psilocybe xeroderma*, répandu dans toute la chaîne du Jura, se trouve certainement ailleurs. C'est peut-être *P. xeroderma* qui a été figuré par Bresadola (Icon. mycol. *pl. 866 fig. 1.* 1931) sous le nom erroné de *Psilocybe physaloides* (Bull. per Mérat) Quél. Quoi qu'il en soit, la planche de Bresadola donne une très bonne idée de la plante décrite ici. *Geophila hyperella* (Fr.) Kühn. & Rom. (Fl. an. 339. 1953) représente peut-être la même espèce. Cependant, ce n'est pas le vrai *Agaricus hyperellus* Fr. (Elench. Fung. 1: 35. 1828) dont le pied est caractérisé ainsi: «stipes vix ½ unc. longus, filo tenuior . . . basis bulbillosa».

On peut séparer *P. xeroderma* de ses congénères par un ensemble de trois caractères. 1) Le chapeau, sec au toucher ou seulement humide, est dépourvu d'un épicutis gélifié ou subgélifié continu. (Sur les coupes tangentielles ou radiales on ne voit, par-ci par-là, que des faisceaux d'hyphes étroites, à peine subgélifiées, qui reposent sur ce qu'on pourrait nommer un hypoderme. Dans les scalps on peut constater que l'épicutis est un réseau à larges claires-voies qui retiennent facilement des bulles d'air.) 2) Les cheilocystides, fusiformes ou sublagéniformes en majeure partie, sont peu allongées et elles sont relativement ventrues [7–12(–15 μ]. 3) Les spores sont petites (longueur moyenne de 6–7 μ) et ont un pore très large.

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DEUX HEBELOMA NOUVEAUX

Par H. S. C. Huijsman (*)
Bôle, Ne., Suisse

(Avec 6 figures dans le texte)

Descriptions et figures de *Hebeloma cavipes* Huijsm. spec. nov. et de *Hebeloma colossus* Huijsm. spec. nov.

Hebeloma cavipes Huijsm., *spec. nov.*—Figs. 1–3

Pileus 20–40 mm, plan-oconvexus, glutinosus, sordide-alutaceus. Velum abest. Lamellae haud plorantes. Stipes 20–40 × 4–7 mm, subcylindricus, percavus, ad apicem cavi flocoo aculeato pendente praeditus, apice farinoso, duabus partibus inferioribus subglabrescentibus, albus. Caro alba; odor saporque subraphanoidei. Sporae 10–12,5 × 5,7–7 μ, amygdaliformes, verruculosae, apice satis acuto, papillato. Cheilocystidia numerosa, 28–60 × –12,5 × 3,5–6 μ, sublageniformes, collo breve, apice subclavato. Numerosus in Cisteto. Typus in Herb. Lugd. Bat. (L 960.110–524).

Chapeau 20–40 mm, plan-convexe ou à mamelon très large et peu individualisé, devenant généralement un peu déprimé au centre, gluant, surtout dans la région discale, plutôt sec dans la zone marginale qui peut avoir un aspect satiné-glacé, beige-alutacé au centre (environ Expo. C63), beige pâle à l'ambitus (intermédiaire entre Expo. A61 et B81), à bord parfois cannelé, incurvé au début. Voile absent. Lames serrées, lamellules de 2 longueurs, arrondies au pied, peu largement adnées, argilacées à isabelle-grisâtre (Expo. B81, C81, allant vers C62); arête serrulée-denticulée, ne pleurant pas. Pied 20–40 × 4–7 mm, subcylindrique, subégal, souvent légèrement courbé vers la base, très creux, généralement avec une mèche pendante, en pointe, au haut de la cavité et avec une mèche pareille et dressée au bas, farineux au sommet jusqu'à la décrépitude, sur les deux tiers inférieurs de la longueur d'abord farineux ou farineux-tomenteux, puis glabrescent, strié, blanc et ne brunissant point, même à la base. Chair blanche, assez épaisse dans le chapeau; odeur faible, de radis à la coupe, saveur faible de radis. Spores 10–12,5 × 5,7–7 μ, amygdaliformes au sommet papillé assez aigu, ponctuées-verruculeuses, à périspore non ou à peine visible. Basides tétrasporiques, 28–36 × 9–12,5 μ, souvent avec une constriction au milieu. Cheilocystides nombreuses, hyalines, d'une longueur de 28–60 μ, généralement sublagéniformes, à ventre proximal, ne dépassant pas une largeur de 12,5 μ et à col assex court, d'un diamètre de 3,5–6 μ, qui se termine en une clavule qui peut atteindre un diamètre de 12,5 μ. Boucles: +.

Nans-les-Pins (Var, France), nombreux dans une Cistaie, le 7 octobre 1960, leg. H. S. C. Huijsman (type; L 960.110–524).

L'absence d'un larmoiement visible des lamelles, le manque d'un voile, l'odeur raphanoïde, les spores amygdaliformes à sommet subaigu, papillé, et les cheilocystides généralement ventrues à leur base suffisent à situer cette espèce dans le voisinage

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immédiat de *Hebeloma sinapizans* (Paul. per Fr.) Gill. Cette parenté est encore accentuée par le pied très creux et par l'appendice de tissu pendant dans la cavité, exactement comme chez *H. sinapizans*. Par ailleurs, *Hebeloma cavipes*, qui poussait en grand nombre sous les Cistes, dans une station d'une étendue de quelques centaines de mètres carrés, se distingue largement de *H. sinapizans* par le manque de squames du pied, la taille minuscule, l'odeur plus faible, les spores plus petites, moins ornementées, l'habitat dans une végétation ouverte, etc.

La Cistaie héberge nombre de petits *Hebeloma* qui, très probablement, ne sont pas liés à cette essence.

Hebeloma colossus Huijsm., *spec. nov.*—FIGS. 4–6

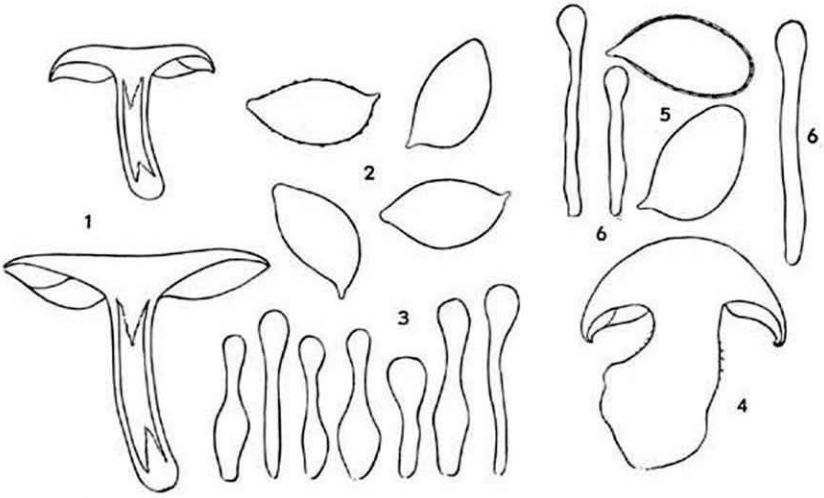
Pileus 60–125 mm, hemisphericus, convexus, vix viscosus, subtiliter innate reticulato-fibrilloso, sordide isabellinus. Velum abest. Lamellae plorantes. Stipes obesus, compactus, albus, praecipue media parte squamis recurvatis albis vel albidis ornatus, bulbo submarginato sordidulo. Caro pilei opima, alba, stipitis compacta, alba vel sordidula; odor saporque subraphanoidei. Sporae amygdaliformes, 10,8–12,4 × 6,4–7 μ, verruculosae, apice haud papillato, obtuso. Cheilocystidia numerosa, 45–72 × 7–11 × 3–5 μ, subcylindrica, apice subclavato. Gregarius in silva frondosa. Typus in Herb. Lugd. Batav. (L 960.110–171).

Chapeau 60–125 mm, hémisphérique, puis convexe, à la fin irrégulier à marge flexueuse, à peine visqueux, beige-isabelle (Expo. A82, B64), plus foncé au centre (au plus Expo. C64, 63), à chevelu inné à peine contrastant avec le fond et s'effaçant à 10–20 mm du bord qui est enroulé et pubescent. Voile absent, même sur les spécimens de peu de millimètres. Lames assez serrées et peu larges, lamellules de 2 ou 3 longueurs, arrondies- ou subémarginées-adnées, argilacé-isabelle, à arête denticulée-serrulée, larmoyante surtout dans la jeunesse, tachetée de brun dans la vétusté. Pied obèse, ne dépassant pas une longueur de 60 mm, atteignant un diamètre de 35 mm au sommet et de 50 mm dans le bulbe submarginé, plein, blanc, à squamules ou bandelettes squamuleuses, pleurantes, beige ou blanches, récurvées et grossières dans le milieu du pied, plus petites et plus serrées vers le bulbe qui est de couleur sale et indécise, plus fines et d'aspect furfuracé au sommet. Chair ferme, compacte, très épaisse dans le chapeau, blanche, devenant tout au plus légèrement beige-isabelle dans le pied des vieux spécimens; odeur faible de radis, saveur faible de rave. Spores 10,8–12,4 × 6,4–7 μ, amygdaliformes, à sommet assez obtus et non étiré-papillé, verruculeuses, à périspore généralement mal visible et ne se décollant pas. Basides 36–43 × 9,5–11 μ, tétrasporiques, subclaviformes. Cheilocystides nombreuses, 45–72 × 7–11 × 3–5 μ, subcylindriques, clavulées à leur extrémité distale, bouclées à leur base.

Grégaire sous les arbres feuillus dans la forêt de la Ste Baume (Var, France), le 8 octobre 1960, leg. H. S. C. Huijsman (type; L 960.110–171).

L'absence d'un voile, même dans les individus très jeunes, l'odeur raphanoïde, le larmoiement des lames, voire des écailles du pied, les spores amygdaliformes au sommet non papillé, assez obtus et, enfin, les cheilocystides allongées, subcylindriques et clavulées, relèguent *Hebeloma colossus* dans un groupe d'espèces mal étudiées et mal connues qui gravitent autour de *H. crustiliniforme* (Bull. per St.-Am.) Quél.

De bons caractères spécifiques sont: la chapeau extrêmement charnu, le revête-



Figs. 1–6. — 1–3. *Hebeloma cavipes* Huijsm. 1. Deux sections médianes (× 1). 2. Quatre spores (× 1540); pour l'une d'entre elles seulement l'ornementation a été figurée, et encore, exclusivement au contour de la coupe optique; la périspore, mal visible, n'est pas indiquée sur le dessin. 3. Cheilocystides (× 500). — 4–6. *Hebeloma colossus* Huijsm. 4. Section médiane d'un carpophore jeune et assez petit (× 0.5). 5. Deux spores (× 1540); même remarque que pour fig. 2, seulement, la périspore, étant mieux visible, a été figurée. 6. Cheilocystides (× 500).

ment piléique à chevelu inné incontestable mais peu évident et le pied plein, solide, bulbeux, orné de nombreuses bandelettes, qui évoque par sa robustesse celui des énormes exemplaires de *Tricholoma colossus* figurés par Åkerlund et publiés par Fries (Ic. sel. Fung. **1**: *pl. 21, 22.* 1869).

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OBSERVATIONS SUR LE GENRE HOHENBUEHELIA

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Bâle, Ne., Suisse

(Avec 11 figures dans le texte)

Descriptions et figures de deux espèces nouvelles suivies d'une classification du genre.

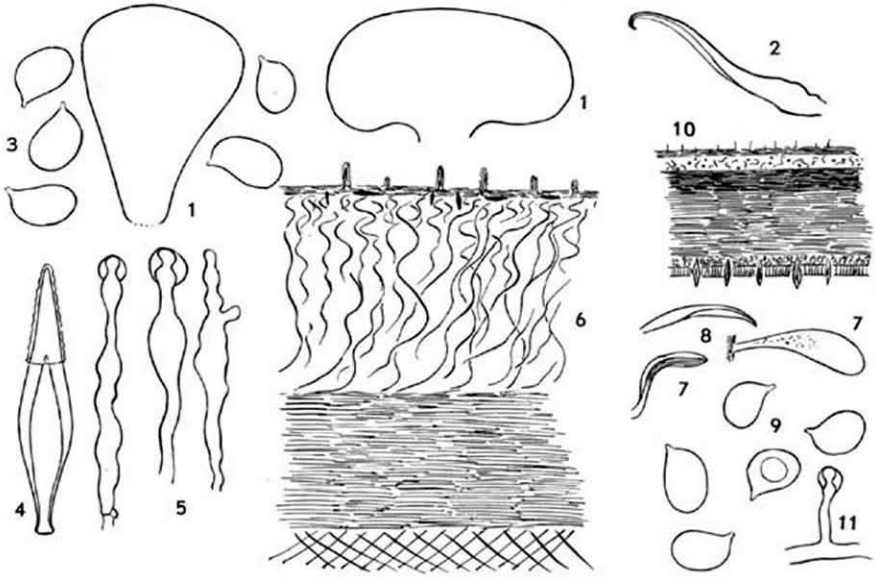
Hohenbuehelia repanda Huijsm., *spec. nov.*—Figs. 1–6

Carpophori solitarii vel subimbricati. Pileus reniformis, conchoideus vel flabelliformis, usque ad circiter 100 mm longus, margine incurvo, fuscobrunneus, initio siccus, pilis substelliformibus albis obtectus, postice villosulus, dein tota superficie glutinosus. Lamellae confertae, attenuato-decurrentes, albidae. Stipes lateralis, brevis, solidus, villosus. Caro alba, elastico-carnosa, sub cute facile diffluente, strato gelatinoso praedita. Sporae 5,7–6,7 × 3,6–5 μ, hyalinae ellipsoideae, obovoideae vel subreniformes, haud amyloideae. Basidia tetraspora. Cheilocystidia moniliformia, tenuiter tunicata. Pleurolamprocystidia 68–110 × 10–20 μ, fusiformia vel subuliformia, cuspidata, crasse tunicata. Stratum gelatinosum pilei crassitudine 500–700 μ, ex hyphis surrectis. Ad lignum subterraneum et caudices putridos, haud dubie *Pini halepensis*. Typus in Herb. Lugd. Batav. (L 960.110–307).

Chapeau réniforme, conchoïde ou flabelliforme à marge enroulée, pouvant atteindre une longueur d'environ 100 mm, au revêtement sec au début et alors piqueté d'innombrables méchules blanches, piliformes ou plus ou moins étoilées, qui se détachent nettement sur le fond brun assez foncé (Expo. F 64, 63, parfois un peu plus pâle) et qui s'enchevêtrent à l'arrière en un feutre, puis devenant gluant par la mise à nue d'une couche gélifiée. Lames serrées avec beaucoup de lamellules, étroites, descendantes sur le pied, blanchâtres ou jaunâtre pâle. Pied latéral, court ou rudimentaire, plein, parfois avec quelques rides prolongeant les lamelles, feutré-villeux. Chair assez mince dans le chapeau, charnue-élastique, blanche, à couche supérieure gélatineuse. Spores 5,7–6,7 × 3,6–5 μ, hyalines, non amyloïdes, ellipsoïdes ou obovoïdes, parfois subréniformes. Basides à 4 stérigmates, 30–38 × 6,5–7,5 μ, subcylindriques. Arête des lames stérile par des leptocystides irrégulièrement moniliformes, pouvant dépasser une longueur de 60–70 μ, bouclées à leur base et souvent enrobées à leur sommet d'une boule de substance durcie qui peut atteindre un diamètre de 16 μ. Pleurocystides de deux sortes: 1) des leptocystides basidiformes dispersées à extrémité distale capitulée et 2) des lamprocystides (= metulae) très nombreuses, mesurant de 68–110 × 10–20 μ, émergeant de 20–40 μ, fusiformes ou subuliformes, très cuspidées, à paroi très épaisse et réfringente, faiblement jaunie et à partie supérieure souvent incrustée d'un capuchon rugueux. Sous-hyménium très mince. Trame des lamelles subrégulière, dense, à hyphes flexueuses d'une largeur d'environ 3–4 μ. Trame du chapeau à trois couches distinctes: 1) la couche inférieure, la trame proprement dite, plus épaisse que les autres assises et constituée d'hyphes emmêlées, dépourvues de pigment, d'un diamètre de 4–8 μ; 2) la couche moyenne, relativement mince,

(*) Ass[illegible] honoraire, «Rijksherbarium», Leyde.

à hyphes surtout radiales, à pigment brunâtre de nature vacuolaire, plus étroites et plus serrées les unes contre les autres que dans la couche sous-jacente; 3) la couche supérieure, fortement gélifiée, d'une épaisseur de 500–700 μ et parcourue d'hyphes bouclées, parfois ramifiées, d'un diamètre de 2–3,5 μ, dressées presque perpendiculairement ou montant en vrille et s'enchevêtrant à la partie supérieure (immédiate-



Figs. 1–11. — 1–6. *Hohenbuehelia repanda* Huijsm. 1. Contours carpophores (× 1). 2. Section médiane (× 1). 3. Cinq spores (× 1540). 4. Lamprocystides des lamelles (× 500). 5. Leptocystides (× 500). 6. Coupe radiale de la partie supérieure du chapeau, légèrement schématisée (× 50); de haut en bas: a) l'épicutis à hyphes couchées avec des faisceaux d'hyphes dressées (les mèches piliformes); b) la couche gélifiée à hyphes ascendentes en spirale, subenchevêtrées sous l'épicutis; entre l'épicutis et la couche gélifiée on voit des lamprocystides incluses qui vont faire partie de la couche extérieure du revêtement piléique dès la diffluence de l'épicutis; c) la couche à hyphes parallèles, radiales, à pigment vacuolaire brunâtre; d) seulement affleurante, la trame proprement dite à hyphes emmêlées. — 7–11. *Hohenbuehelia spatulina* Huijsm. 7. Deux fructifications (× 1); l'une (à droite) non coudée, vue d'en haut, à axe courbé un peu latéralement; l'autre, coudée, vue en profil. 8. Section médiane du carpophore à droite. 9. Spores (× 1540). 10. Coupe radiale du chapeau, légèrement schématisée (× 50); de haut en bas: a) l'épicutis à hyphes couchées, surmonté, ça et là, d'extrémités d'hyphiques séparées et dressées; b) la couche gélifiée très mince à hyphes emmêlées; c) la trame proprement dite à hyphes radiales, parallèles, à portion supérieure plus dense que l'autre et, en même temps, plus foncée, probablement par la présence d'un pigment vacuolaire; d) le sous-hyménium remarquablement épais; e) l'hyménium avec de nombreuses lamprocystides saillantes qui naissent au niveau de la base du sous-hyménium. 11. Une leptocystide du revêtement piléique (× 500), qui est infiniment mieux développée que la plupart d'entre elles.

ment au dessous de l'épicutis), où la gélification est moindre. Epicutis atteignant à peine une épaisseur de 25 μ, constitué d'hyphes d'un diamètre de 2–3 μ, subemmêlées, subradiales, non ou seulement subgélifiées et donnant naissance à des faisceaux d'hyphes accolées et dressées qui peuvent atteindre une longueur de 100 μ et qui passent à un enchevêtrement d'hyphes dans la partie postérieure du chapeau. De nombreuses pilocystides, parfaitement incluses, couchées ou dressées, mesurant de 55–90 × 5–9 μ, subuliformes ou sétiformes, franchement jaunies, subidentiques aux lamprocystides des lamelles, se trouvent éparpillées au niveau de la base de l'épicutis. Après la diffluence de ce dernier, l'enchevêtrement supérieur de la couche gélifiée de la chair et les pilocystides constituent la couche externe du revêtement piléique. Trame pédiculaire à texture identique à celle de la couche 1) de la trame piléique et engainée dans une couche d'hyphes parallèles, prolongeant les hyphes de la couche 2); le tout généralement enveloppé d'un feutre, analogue à celui qui recouvre la partie postérieure du chapeau; caulocystides nombreuses à la base du feutre et ressemblant aux lamprocystides des lamelles, mais de couleur beaucoup plus foncée, parfois même brune.

Assez commun aux environs de Nans-les-Pins (Var, France), pendant la première moitié d'octobre 1960, isolé ou subisolé sur du bois enfoui ou sur de vieilles racines, subimbriqué sur des souches en décomposition de *Pinus halepensis*. Probablement aussi sur d'autres essences. Récolte du type (L 960.110–307), le 10 octobre 1960, près de Nans-les-Pins par H. S. C. Huijsman.

La planche de Bresadola (Icon. mycol. *pl. 292*. 1928), se rapportant à une espèce des bois de pins sous le nom de *Pleurotus geogenius* (DC. apud Fr.) Gill., donne une idée parfaite de *Hohenbuehelia repanda*. Les mesures sporiques (8–9 × 4–4,5 μ), dont fait mention Bresadola, cadrant mal avec celles de l'espèce de Nans-les-Pins, il serait imprudent, pour l'instant, de considérer *Pleurotus geogenius* sensu Bres, comme synonyme de *H. repanda*. En outre il serait peu judicieux d'assimiler, a priori, à l'*Agaricus geogenius* DC. apud Fr. (Epicr. 134. 1838), « pileo subinfundibuliformi », l'espèce du Trentin de même que celle du Var qui, l'une et l'autre, ont le chapeau étalé (1). On pourrait encore incliner à identifier *H. repanda* avec *H. petaloides* (Bull. per Fr.) S. Schulz., bien que cette dernière espèce préfère les arbres feuillus et qu'elle ait la couleur du chapeau moins foncée. Toutefois, essayant de comparer de près l'espèce de Nans-les-Pins à *H. petaloides* on se heurte à la difficulté que ce dernier est encore mal défini et qu'il a été confondu couramment avec certains de ses congénères. En voici trois exemples dont on pourrait multiplier facilement le nombre. 1) Schulzer von Müggenburg (*in* Verh. zool.-bot. Ges. Wien **16**: 45. 1866), l'auteur du « barbarisme » *Hohenbuehelia* (voir Becker *in* Rev. Mycol., Paris **24**: 445. 1959) a désigné *H. petaloides* comme espèce-type du genre; par contre

(1) Ayant pu étudier tout récemment du matériel authentique de Bresadola conservé à Stockholm, grâce à l'obligeance du Dr. S. Ahlner, j'ai obtenu la conviction que la planche de l'auteur italien (Fungi trident. *pl. 50*. 1884 et Ic. Myc., l.c.) ne se rapporte pas à *H. repanda* mais à *H. rickeni* (Kühn.) Kühn. (nomen alternativum *in* Bull. Soc. Nat. Oyonnax **8**: 75. 1954).

Microscopiquement *H. rickeni* se distingue facilement de *H. repanda* par les spores sensiblement plus allongées (7–9,2 × 4.2–5,3 μ) et par la couche piléique gélifiée beaucoup plus mince (70–150 μ), à hyphes subhorizontales, très lentement ascendantes.

l'espèce qu'il a décrit sous ce nom est probablement *H. geogenia* (DC. apud Fr.) Sing. 2) Un auteur aussi averti que J. E. Lange a commis une erreur pareille en figurant *H. geogenia* sous le nom de *Pleurotus petaloides* (Bull. per Fr.) Quél. (Fl. Agar. dan. **2**: *pl. 65 fig. E.* 1936). 3) A la suite de leurs récoltes, Corbière et Heim (*in* Mém. Soc. nat. Cherbourg **40**: 100. 1929) sont arrivés à la conclusion que « *Pleurotus geogenius* n'est qu'une forme de *P. petaloides* ».

Pour y voir plus clair, il y a lieu de se référer à Kôhner (*in* Bull. Soc. Nat. Oyonnax **8**: 78. 1954) qui a été le premier à délimiter nettement *H. geogenia* sous le nom de *Geopetalum geogenium* (DC. apud Fr.) Pat. Or, Kôhner a démontré, ce qui est d'une importance capitale, que la couche gélifiée qui surmonte la trame piléique proprement dite « est formée d'hyphes obliquement ascendantes dans sa partie inférieure, s'emmêlant vers le haut ». J'ai pu vérifier cela sur du matériel provenant de Compiègne (Oise) et d'Oyonnax (Ain).

En revenant maintenant à *H. petaloides*, il me semble préférable de comprendre cette espèce telle que celle-ci est conçue, par tradition, par la plupart des mycologues français, et qu'elle a été figurée par Bulliard [Herb. Fr. *pl. 557 fig.* 2. 1791, non *pl.* 226. 1784; Fries (Syst. mycol. **1**: 185. 1821 et opera posteriora) se réfère aux deux planches à la fois] ainsi que par certains auteurs plus récents, par exemple par Konrad et Maublanc (Icon. sel. Fung. **4**: *pl. 307.* 1937, sporis exclusis). En pratiquant des coupes microscopiques du chapeau de *H. petaloides*, ainsi défini, la texture de la couche gélifiée se révèle tout à fait différente de celle de *H. geogenia*, mais identique à celle qu'a figurée R. Maire (*in* Bull. Soc. mycol. Fr. **46**: 220. 1930, *H. petaloides* sub nomine *Pleurotus auriscalpium*). En effet, les hyphes parcourant le gélin ne montent pas vers l'épicutis mais sont couchées radialement, parallèles à la surface piléique.

En comparant, sous un même couvre-objet, une coupe radiale du chapeau de *H. petaloides* à une coupe pareille de *H. geogenia*, la différence est incontestable. Lorsque l'on compare des coupes piléiques transversales de ces deux espèces, la différence devient évidente au plus haut degré. Tandis que la couche gélifiée de *H. petaloides* ne présente guère, dans ce cas, que de petits ronds, les hyphes coupées perpendiculairement sur leur axe, on ne voit, chez l'autre espèce, que des hyphes montant droit ou en tire-bouchon vers l'épicutis.

Impossible donc de faire de *H. repanda*, à constitution du gélin comparable à *H. geogenia*, une forme ou une variété de *H. petaloides*. En réalité, la comparaison attentive de la couche gelatineuse de *H. repanda* avec celle de *H. geogenia* ne donne pas une identité parfaite. Notamment, dans les coupes radiales, les hyphes du gélin montent obliquement et assez lentement vers l'épicutis chez *H. geogenia*, tandis que la direction générale des mêmes hyphes de *H. repanda* est verticale ou à peu près. De plus, dans mes récoltes personnelles, l'épaisseur de la couche gélatineuse de *H. geogenia* ne dépasse pas 200 μ (Kühner, l.c.: 240 μ), pour osciller entre 500 et 700 μ chez l'autre. Il ne semble pas exclu que *Geopetalum geogenium* var. *queletii* Kühner (*apud* Kühner & Romagnesi, Fl. an. 70 *fig. 120.* 1953; *in* Bull. Soc. Nat. Oyonnax **8**: 80. 1954), pour lequel l'auteur a donné les mêmes caractéristiques

de la couche gélatineuse que présente *H. repanda* n'en soit qu'une forme ou une variété chétive des bois feuillus.

L'anatomie de l'espèce décrite est très compliquée. Il convient de remarquer que la couche gélifiée du chapeau peut descendre sur le pied qui, d'ailleurs, est ici plutôt une prolongation stérile du chapeau qu'un organe bien différencié. Même, dans certains cas, le gélin se poursuit vers la base du pied jusqu'à la face ventrale du carpophore.

Hohenbuehelia repanda se distingue des espèces affines par: le port pleurotoïde et non « géogénoïde », la couleur du chapeau relativement très foncée, les mèchules épicuticulaires qui font penser aux poils étoilés de certains Primulaceae (p. ex. *Androsace alpina*), la texture et l'épaisseur de la couche gélifiée piléique, les spores assez petites et sa préférence pour le bois de pins.

Sur la plupart des échantillons récoltés, l'épicutis s'était évanoui si bien que la couche gélifiée était à nu. Ayant séjourné à Nans-les-Pins pendant une période exceptionnellement pluvieuse, je suppose que, dans des conditions normales, on trouve généralement l'épicutis intact.

Hohenbuehelia spatulina Huijsm., *spec. nov.*—FIGS. 7–11

Carpophori anguste spatulaeformes, stipitati, pusilli. Pileus 5 mm latus, siccus, subtomentosus, sordide ochraceus, (« café-au-lait »). Lamellae confertae, attenuato-decurrentes, albidae. Stipes lateralis, bene evolutus, solidus, albidus, villosulus. Caro carnoso-elastica, concolor. Sporae 4,5–6,4 × 3,6–4,3 μ, hyalinae, ellipsoideae vel subreniformes, haud amyloideae. Basidia tetraspora. Cheilocystidia et pleurocystidia ut in *H. repanda* sed minora. Stratum gelatinosum sub cute pilei pertenue, 40–50 μ, ex hyphis maxime intertextis. Duo carpophori in ligno putrido arboris frondosae. Typus in Herb. Lugd. Bat. (L 960.110–013).

Carpophores étroitement spatuliformes ou pétaliformes à axe courbé latéralement ou coudé, stipités, minuscules, ne dépassant pas une longueur de 18 mm et une largeur de 5 mm. Chapeau sec, mat, subtomenteux, surtout postérieurement, café-au-lait. Lames serrées, avec plusieurs lamellules, assez étroites, blanchâtres, puis grisâtre pâle à arête restant blanchâtre. Pied latéral, plein, blanchâtre, légèrement villeux. Chair charnue-élastique, moyennement épaisse dans le chapeau, concolore, à faible odeur de farine. Spores 4,5–6,4 × 3,6–4,3 μ, hyalines, ellipsoïdes, obovoïdes, ou subréniformes, souvent ocellées, non amyloïdes. Basides à 4 stérigmates, 20–26 × 5,5–7 μ, subclaviformes. Arête des lamelles stérile par des leptocystides analogues à celles de *H. repanda*, mais plus petites. Pleurocystides nombreuses, 45–70 × 9–14 μ, insérées au niveau de la base du sous-hyménium, fusiformes, très cuspidées, à paroi épaissie et réfringente, généralement incrustées d'un capuchon rugueux. Sous-hyménium aussi épais que l'hyménium. Trame des lamelles subrégulière, dense, à hyphes étroites, flexueuses. Trame du chapeau constituée de deux couches: 1) la couche inférieure, la trame proprement dite, prenant la plus grande partie de l'épaisseur du chapeau, à hyphes radiales ou subradiales qui dépassent à peine un diamètre de 7 μ, ou même de 4,5 μ dans sa zone supérieure qui est plus dense et de couleur plus foncée; 2) la couche supérieure d'une épaisseur de 40–50 μ, très gélifiée et parcourue d'hyphes bouclées, parfaitement emmêlées, d'un diamètre de 2–4,5 μ. Epicutis d'une épaisseur de 15–20 μ, formé d'hyphes étroites non-gélifiées, ou seulement subgélifiées, subemmêlées-subradiales, surmonté de deux sortes de formations: 1) d'hyphes dispersées, dressées, mesurant de 18–25 ×

1,5–2 μ; 2) d'ébauches de leptocystides, le plus souvent couchées, restant facilement inaperçues et ressemblant aux cheilocystides, bien qu'étant beaucoup moins différenciées. Pas de lamprocystides à la limite de l'épicutis et de la couche gélifiée.

Deux exemplaires sur un morceau de bois pourrissant d'arbre feuillu avec, en outre, *Crepidotus cinnabarinus* (localement assez commun), dans la Forêt de la Ste Baume (Var, France), le 13 octobre 1960, leg. H. S. C. Huijsman (type; L. 960. 110–013).

On pourrait incliner à penser que *Hohenbuehelia spatulina* ne représente qu'une forme à taille réduite de *H. petaloides* (Bull. per Fr.) S. Schulz. Cependant, en pratiquant des coupes radiales et transversales du chapeau, on peut se convaincre facilement que les hyphes de la couche piléique gélifiée sont très emmêlées chez *H. spatulina*, tandis que, comme nous avons déjà vu (page 104), toutes les hyphes de cette couche sont couchées et parallèles les unes aux autres chez *H. petaloides*. C'est par l'emmêlement total des hyphes de la couche gélifiée que *H. spatulina* se distingue en même temps de tous les autres *Hohenbuehelia* pétaloïdes examinés jusqu'à présent. D'autres caractères d'importance sont encore: la petitesse, surtout l'étroitesse, des carpophores, le pied assez allongé, la minceur de la couche gélatineuse, la grande régularité de la trame piléique proprement dite qui est dépourvue d'une zone à hyphes emmêlées et, enfin, l'épaisseur du sous-hyménium.

* * *

Le genre *Hohenbuehelia* se définit ainsi: hyménophore lamellé, pied généralement latéral et peu différencié ou apode, spores hyalines, lisses, non amyloïdes, face des lamelles à lamprocystides cuspidées, trame piléique à gélification partielle ou totale.

Espèce type: *H. petaloides* (Bull. per Fr.) S. Schulz. sensu S. Schulz.

Ainsi compris, on exclut *Geopetalum carbonarium* (A. & S. per Pers.) Pat. et *Panellus serotinus* (Schrad. per Fr.) Kühner du genre *Hohenbuehelia*.

En subdivisant le genre en question, j'admets l'identité de *Agaricus petaloides* Bull. per Fr. sensu S. Schulz. et de *A. geogenius* DC. apud Fr. (2).

1. Subgen. *Hohenbuehelia*.

Couche piléique gélatineuse plus mince que la trame proprement dite qu'elle surmonte.

Pleurotus subgen. *Acanthocystis* Fayod *in* Ann. Sci. nat. (Bot.) VII **9**: 338. 1889. — *Pleurotus* sect. *Acanthocystis* (Fayod) Pilát *in* Atl. Champ. Eur. **2**: 18, 87. 1935. — *Geopetalum* subgen. *Acanthocystis* (Fayod) Kühner & Romagn., Fl. anal. Champ. sup. 67, 68. 1953 (non valablement publié). — Espèce type: *Pleurotus geogenius* (DC. apud Fr.) Gill.

Acanthocystis subgen. *Eu-Acanthocystis* Sing. *in* Rev. Mycol. **1**: 77. 1936 (non valablement publié) ≡ *Pleurotus* subgen. *Acanthocystis* Fayod.

a. Sect. *Hohenbuehelia*.

Hyphes de la couche piléique gélifiée ascendentes vers l'épicutis. Espèce type: *Agaricus petaloides* Bull. per Fr. sensu S. Schulz.

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(2) Je tiens à remercier vivement le Dr. M. A. Donk qui a dressé ici la synonymie et qui a choisi les lectotypes.

b. Sect. **Dimidiati** (Fr.) Huijsm., *comb. nov.*

Agaricus [sect.] *Dimidiati* Fr., Epicr. 134. 1838; P. Henn. *in* Nat. PflFam. **1** (1**): 260. 1898 (sect.). — *Pleurotus* sect. *Dimidiati* (Fr.) Quél., Ench. Fung. 149. 1886; Sacc., Fl. ital. crypt., Hym. 303. 1915 (sect.). — Espèce type: *Agaricus petaloides* Bull. per Fr.

Agaricus stirps *A. petaloidis* Fr., Summ. Veg. Scand. 285. 1849 ≡ *Agaricus* sect. *Dimidiati* Fr.

Agaricus [sect.] *Holopleurus* Fr., Monogr. **1**: 247. 1857; Cooke, Handb. Brit. Fungi **1**: 49. 1871 (sect.) ≡ *Agaricus* sect. *Dimidiati* Fr.

Pleurotus [subsect.] *Ovispori* J. E. Lange *in* Dansk bot. Ark. **6** (5): 23, 28. 1930. — Espèce type: *Pleurotus petaloides* (Bull. per Fr.) Quél.

Hyphes de la couche piléique gélifiée radiales et parallèles à la surface piléique.

c. Sect. **Spatulina** Huijsm., *sect. nov.*

Hyphae strati gelatificati pileo omnino intricatae. — Typus sectionis: *Hohenbuehelia spatulina* Huijsm.

Hyphes de la couche piléique gélifiée parfaitement emmêlées.

2. Subgen. **Omphalaria** (Fr. ex Chev.) Huijsm.

Agaricus trib. *Omphalaria* Fr., Syst. mycol. **1**: 179, 189. 1821 (nom du rang assigné fautif). — *Agaricus* subsect. *Omphalaria* (Fr.) ex Chev., Fl. gén. Env. Paris 1: 194. 1826; non *Agaricus* sect. *Omphalarii* Fr., Syst. mycol. **1**: 79. 1821; non *Agaricus* sect. *Omphalariae* Fr., Syst. mycol. **1**: 136. 1821; non *Agaricus* sect. *Omphalariae* Fr., Syst. mycol. **1**: 156. 1821. — *Agaricus* [sect.] *Omphalaria* (Fr. ex Chev.) Fr., Monogr. **1**: 252. 1857; Cooke, Handb. Brit. Fungi 1: 50. 1871 (sect.). — *Pleurotus* [sect.] *Omphalaria* Quél. *in* Mém. Soc. Émul. Montbéliard II **5**: 113. 1872 (Champ. Jura Vosges 79). — Espèce type: *Agaricus mastrucatus* Fr. per Fr.

Agaricus stirps *A. mastrucati* Fr., Summ. Veg. Scand. 285. 1849.

Couche piléique gélatineuse au moins aussi épaisse que la trame proprement dite qu'elle surmonte.