Notes RBG Edinb. 40(3):537–558 (1983)

OBSERVATIONS ON THE BOLBITIACEAE: 22 FURTHER VALIDATIONS

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ABSTRACT. The following validations within the genus *Conocybe* are made: *C. anthracophila, C. cylindracea, C. excedens, C. leucopus* and *C. pallidospora*, all in subgenus *Conocybe*, and *C. peronata* and *C. subnuda* in subgenus *Pholiotina*. The correct identity of *Agaricus pilosellus* is discussed. Two new species, *C. mutabilis* Watling and *C. piloselloides* Watling, are described. Data is presented on members of the *C. arrhenii, C. dumetorum* and *C. siliginea* groups.

INTRODUCTION

During the preparation of a check-list of the World species of Bolbitiaceae several distinct taxa described in *Le Genre Galera* (Kühner, 1935) were indicated as being invalid (Watling & Gregory, 1981). An earlier part of this series (Watling, 1980) validated those taxa found in the British flora, but several European and N African taxa, not yet recorded from Britain, need similar attention. The descriptions provided below complete the task. It has not been considered necessary to repeat the macroscopic descriptions offered by Kühner (1935) since nothing more could be added from the dried material.

CONOCYBE SUBGENUS CONOCYBE

SECTION CONOCYBE

1. Conocybe excedens [Kühner ex] Kühner & Watling, **sp. nov.** Fig. 1 A & B.

Syn.: *C. mesospora* [Kühner ex] Kühner & Watling var. *excedens* Kühner, Le Genre Galera 56 (1935), *nomen nudum*.

Pileus 11–19 mm e campanulato-conico campanulatus vel conicus ochraceo-brunneus vel castaneus, siccitate ochraceus vel sordide luteolo-brunneus, jove pluvio ad discum striatus, jove sicco opacus. Stipes 37–55 × 1.7–2 mm, bulbillosus. Sporae (6.2–)6.7–7.8(–8.2) × (4.2–)4.5(–5) μm, ellipsoideo-ovoideae vel ellipsoideo-amygdaliformes poro germinativo. Basidia tetrasporigera 17–23 × 6–8.5 μm. Cystidia aciei lamellarum lecythiformia 15–20(–25) × 5.5–9 μm, capitulis 2.5–4.5 μm latus. Cystidia stipitis similia. Cellulae cuticulae pilei pyriformes vel sphaeropedunculatae, 10–20 μm diam. rariore lecythiformes (capitulis 2.5–5 μm).

Typus: Bois de Vincennes, Paris, France, 23 ix 1932, *Kühner* (holo. Hb. Kühner, Lyon; slide in E).

This fungus grows solitarily or in small groups amongst herbs etc. on lawns and in grassy places.

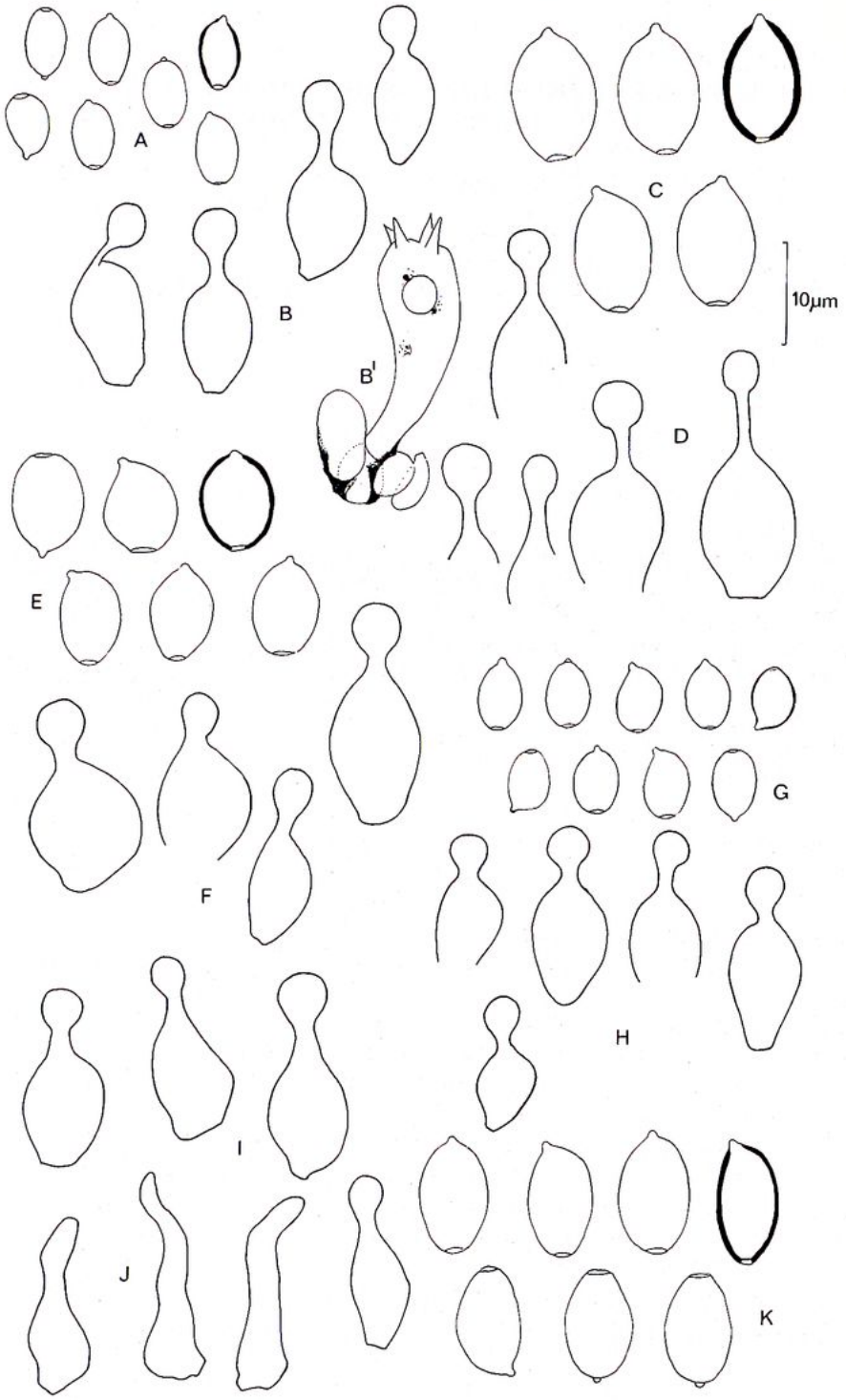


FIG. 1. Basidiospores and cheilocystidia: A & B, *Conocybe excedens*, type; C & D, *C. leucopus*, type; E & F, *C. cylindracea*, type; G & H, *C. pallidospora*, type; I & K, *C. anthracophila*, type. Caulocystidia: J, *C. anthracophila*, type. Basidium: B′ *C. excedens*. Magnification as indicated.

C. excedens was originally described as a variety of *C. mesospora* Kühner & Watling but differs in the more sombre colouration, projecting margin to the pileus, distinctly, although only slightly, amygdaliform basidiospores and rather long neck to the lecythiform cheilocystidia. This species also differs from *C. mesospora* in the rather thicker-walled basidiospores and the deposition of amorphous material in the basidia. It is intermediate in size between *C. mesospora* and *C. brunneola* Kühner & Watling. Six collections were made by Kühner within four days of one another; the collection made on 23 ix 1932 is taken as type.

In keeping with *C. mesospora* and *C. dumetorum* (Velenovský) Svrček (= *C. laricina*), *C. excedens* shows a tendency to form lecythiform cystidia in the pileal palisadoderm.

2. Conocybe leucopus [Kühner ex] Kühner & Watling, **sp. nov.** Fig. 1C & D.
Syn.: *Conocybe leucopoda* Kühner, Le Genre Galera 82 (1935), *nomen nudum*.

Pileus 17 mm, campanulatus, hygrophanissimus, brunneo-ochraceus, siccitate ochraceus vel sordide ochraceo-cremeus, jove pluvio rugulosus sed mox exstriatus siccans. Stipes 60 × 2.5 mm, albus vel cremeus, pruinosus, aequaliter. Sporae 11.7–13.3(–14.5) × (7.5–)7.8–9 μm, ellipsoideae poro germinativo. Basidia tetrasporigera 27–38 × 12–14.5 μm. Cystidia aciei lamellarum 20–25 × 7–9.5 μm, capitulis 3–4.5 μm latis. Cystidia stipitis similia. Cellulae cuticulae pilei pyriformes vel sphaeropedunculatae, 11–20 μm diam.
Typus: La Réghaïa, Algiers, Algeria (N Africa), 14 xi 1932, *Kühner* (holo. Hb. Kühner, Lyon; slide in E).

This species was originally described from Algeria but has since been recorded from Tangier, Morocco, although apparently not as yet in France. It has been collected on mineral soils in the British Isles on two occasions (in Co. Durham and Sussex). On the continent *C. leucopus* has been recorded from a sandy dyke along the river IJssel in the Netherlands (Arnolds, 1977).

The pileus in European material varies from 15–20 mm in breadth; however, *C. leucopus* is a very distinctive agaric in the contrasting white stipe and ochraceous yellow, strongly wrinkled pileus. As Kühner (1935) indicates, collections in the field resemble in many ways the figure in Fries' *Icones* (Tab. 120 fig. 1. 1877–1884) labelled *Galera pygmaeoaffinis*. These two fungi, however, are quite unrelated.

Microscopically *C. leucopus* can be distinguished immediately by its large basidiospores with thick, strongly pigmented walls and large germ-pores, rather narrow cheilocystidia with small heads and the presence of only lecythiform caulocystidia. Mounts of the gills in ammoniacal solutions do not produce acicular crystals on drying.

Singer (1950) considers *C. leucopus* as a four-spored form of *C. striatipes* (Spegazzini) Singer (*Galera striatipes* Spegazzini in *Ann. Mus. Nac. Buenos Aires* 6: 135, 1898) but a collection so named by Singer in MICH does not conform exactly with the published data. At present I propose to retain the two taxa as separate at specific rank; if laboratory studies with *Coprinus* spp. and members of the *Conocybe pubescens* group can be used as a guide then the decision may be supported in the future by experimental information. I suspect that the inclusion of the reference to a two-spored

form in European literature (Kühner & Romagnesi, 1953 and Moser, 1978) is based on Singer's suggested synonymy. As pointed out by Singer (1950) if the two species are conspecific then Spegazzini's epithet has priority. What could be Spegazzini's fungus has appeared in cucumber houses in the Netherlands (Daams, 1972: material in E); unfortunately Daams' material is only partially fertile and no definitive determination could be made.

SECTION PILOSELLAE

3. Conocybe anthracophila [Maire & Kühner ex] Kühner & Watling, **sp. nov.** Figs. 1 I–K & 4G.

Syn.: *C. siliginea* (Fries ex Fries) Kühner var. *anthracophila* R. Maire & R. Kühner, Le Genre Galera 97 (1935), *nomen nudum*.

Pileus 22–27 mm, campanulatus conico-campanulatus vulgo lato-umbonatus, brunneo-ochraceus vel fulvo-brunneus ad discum obscuriore coloratus jove pluvio striatissimus, totus minuto pubescens. Stipes 80 × 1.5–2 mm, bulbillosus. Sporae 10–12(–12.5) × 6–7.2(–7.5) μm ovoideae poro germinativo. Basidia tetrasporigera 18–25 × 8–8.5 μm. Cystidia aciei lamellarum lecythiformia 14.5–17.5 × 7–9.5 μm, capitulis 3–4.5 μm latis. Stipes et cellulis non-capitalis ovoideo-ellipsoideis vel lageniformia et pilis angustibus longis 1–2 μm latis obtectus. Cellulae cuticulae pilei pyriformes vel sphaeropedunculatae 20–35 μm diam.

Typus: Yakouren (Kabylie), N Africa, 23 xii 1932, *Kühner* (holo. Hb. Kühner, Lyon; slide in E).

This species was described originally from a troop accompanied by *Hebeloma anthracophilum* Maire at the site of a bonfire in an evergreen oak forest. Judging from recent observations this species is not restricted to a carbonicolous habitat but may be found on mineral soil in a variety of disturbed sites. Based on an examination of the type material and an excellent collection from Manchester, England, I have no hesitation in raising the taxon, originally considered a variety of *C. siliginea* (Fries) Kühner, to specific rank.

Although a member of sect. *Pilosellae,* the stature of this species is outwith the *C. siliginea* complex. If it were not for the complete lack of lecythiform caulocystidia this species would, in many respects, approach the *C. subpubescens* group. The stipe is covered in numerous ovoid to ellipsoid cells at the apex, intermixed with flexuous hairs 1–2 μm broad.

4. Conocybe pallidospora [Kühner ex] Kühner & Watling, **sp. nov.** Fig. 1 G & H.

Syn.: *C. siliginea* (Fries ex Fries) Kühner var. *pallidospora* Kühner, Le Genre Galera 100 (1935), *nomen nudum*.

Pileus 6–10 mm, campanulatus vel conicus, ochraceus vel ochraceo-brunneus jove sicco cremeo-ochraceus, jove pluvio striatus. Stipes 20–25 × 0.3–0.7 mm, subbulbillosus. Sporae (5.7–)7–8(–8.7–11) × (3.5–)4.5–5(–6.2) μm, ellipsoideae vel leviter amygdaliformes poro germinativo. Basidia tetrasporigera 15–20 × 6.5–7 μm. Cystidia aciei lamellarum lecythiformia 17–18 × 7–10 μm, capitulis 2–4(–4.5) μm latis. Stipitis et cellulis similibus capitatis vel non-capitatis lageniformia vel cylindrica. Cellulae cuticulae pilei pyriformes vel sphaeropedunculatae 17.5–30 μm diam.

Typus: Ozoir-la-Ferrière, Paris, France, 28 ix 1932, *Kühner* (holo. Hb. Kühner, Lyon; slide in E).

Singer (1959) attempted to validate the name but failed on a technicality (see Watling, 1977).

This is not related to *C. siliginea,* although originally described as a variety of it. The basidiospores are very pale as indicated by the epithet; they are also thin-walled and almost pointed towards the relatively large, yet inconspicuous, germ-pore. The stipe, unlike that of *C. siliginea,* also possesses a few lecythiform caulocystidia at the very apex. The spores are rather variable in size, although usually measuring 7–8 × 4.5–5 μm, and the cystidia are rather delicate in overall appearance.

The species is based on three collections from Ozoir-la-Ferrière and Bois de Vincennes, both in the vicinity of Paris. A collection from Ozoir which shows the best characters outlined by Kühner (1935) has been chosen as type.

This is a rare fungus which I have not seen in the field; apparently when fresh it has the aspect of members of the *C. siennophylla* complex.

5. Conocybe cylindracea [Maire & Kühner ex] Kühner & Watling, **sp. nov.** Fig. 1 E & F.

Syn.: *C. cylindracea* Maire & Kühner, Le Genre Galera 114 (1935), *nomen nudum.*

Pileus 3–7(–10) mm, elongato-campanulatus, ellipsoideo-cylindricus non expansus, griseo-brunneus vel fusco-griseus jove sicco brunneo-ochraceus, jove pluvio exstriatus juventute totus minute villosus. Sporae (8.5–)9.5–10.5(–12) × 6.5–7.7(–8.3) × 6–6.5 μm lentiformes vel ovoideae poro germinativo. Basidia bi- vel tetrasporigera. Cystidia aciei lamellarum lecythiformia 15–20 × 8–9 μm capitulis 3.5–5.5 μm latis. Stipes et cellulis non capitatis lageniformia vel cylindrica et pilis angustibus longis 1–2 μm latis obtectus. Cellulae cuticulae pilei pyriformes vel sphaeropedunculatae 10–30 μm diam.

Typus: La Réghaïa, Algeria, N Africa, 14 xi 1932, *Kühner* (holo. Hb. Kühner, Lyon; slide in E).

Singer attempted to validate the name in 1959 but failed on a technicality (see Watling, 1977).

This species is easily recognized by the conico-ellipitic to cylindric, unexpanding greyish pileus, and the villose nature of both stipe and pileus. The basidiospores are much more flattened in one view than illustrated by Kühner (1935); the enormous germ-pore is very distinctive.

This species was originally based on three collections of which one has been examined and cited as type. All the collections were from Algeria (La Réghaïa, Camp des Chênes and Maison Carrée, legit G. Faurel). More recently Malençon & Bertault (1970) recorded it from a clearing in a forest at Azron also in Algeria. Although the dimensions of the basidiospores were slightly longer than for the three earlier collections, the Azron material agreed in all other respects, indeed the latter authors described the shape of the basidiospores more correctly; they are slightly lenticular. This species has been recorded from Spain (Moreno & Barrasa, 1977) but the spores were described as narrowly elliptic, hardly the same as those of the type.

C. cylindracea approaches members of the *C. lactea* complex, i.e. *Conocybe* sect. *Candidae,* indeed Kühner expressed the opinion that Britzelmayr's plate of *Agaricus lateritius* (1881) resembled the Algerian species. The complexity surrounding the innumerable interpretations of *Agaricus lateritius* must be deferred until an account devoted entirely to the group has been prepared. The present fungus, apart from the distinctly pigmented pileus, differs from *C. lactea* (J. E. Lange) Métrod and *C. crispa* (Longyear) Singer etc., in the pigmented stipe, smaller basidiospores and lack of brachycystidia. It is, however, unique in sect. *Pilosellae* in its cylindrical, hardly expanding pileus.

Kühner drew parallels between *C. cylindracea* and *Galera angusticeps* Peck (= *Conocybe angusticeps* (Peck) Murrill) but the latter is a much more bulky fungus, differing particularly in its more gasteroid features. Singer (1963) transferred Peck's fungus to the heterogeneous genus *Galeropsis* because of its resemblance to *Galeropsis besseyi* (Peck) Heim and its relatives.

Examination of the type material shows that *Galera angusticeps* possesses bolbitiaceous characters but there is no convincing evidence to suggest that it is secotiaceous. It neither possesses a basidium with symmetrically attached basidiospores nor is there documentation to the effect that these spores fail to discharge forceably. Based on morphology of the basidiospores, it can only be concluded that this is nothing more than a xerophytic member of the genus *Agrocybe* (sect. *Pediadae*). The new combination *A. angusticeps* (Peck) Watling has already been made (Watling & Gregory, 1981).

6. C. siliginea (Fries ex Fries) Kühner

Kühner in *Le Genre Galera* (1935) recognized several infraspecific taxa within his concept of *Agaricus siligineus* [Fr. ex] Fr., 1821. These were var. *anthracophila,* var. *neoantipus,* var. *pallidospora,* var. *ocracea* (récoltes microspores & récoltes macrospores), var. *ambigua* and forma *typica* (récoltes bisporiques & récoltes tétrasporiques). It is now accepted that not only are var. *anthracophila* and var. *pallidospora* (discussed above), and var. *ambigua* autonomous species but so also are the two forms of var. *ocracea* described by Kühner. During the present study it has been possible to examine several collections in Hb. *Kühner*, Lyon, on which some of these names and descriptions are based. Var. *ambigua* has been discussed previously (Watling, 1980) but in order to complete the picture, illustrations of the microscopic characters of the collection from Afghanistan cited by Singer (1951) in his proposed validation of *C. ambigua* are given.

Fig. 3 C & D illustrate both the basidiospores of *C. ambigua* (Afghanistan, received R. Singer 1958, legit A. Gilli: MICH) and of the collection accepted as type for the name. As can be seen the sporograms are clearly different and represent the spores of quite different taxa.

For further discussion on *C. ambigua* [Kühner ex] Watling see Watling (1980).

Var. **neoantipus** (Atkinson) Kühner, Le Genre Galera 98 (1935).
Basionym: *Galerula neoantipus* Atkinson in Proc. Amer. Phil. Soc. 57: 371 (1918).

The type of *Galerula neoantipus* Atkinson is based on a collection by Prof. E. A. Burt from a newly seeded lawn at Middlebury, Vermont (viii 1896). It was originally identified as *Galera antipoda* Lasch but the name on the packet has been crossed out in red ink, presumably by Atkinson, and 'Type' added, also in red ink, along with the new name. The material at CU is damaged, consisting of two fragmentary basidiomes and several pieces of stipe, undoubtedly previously rooting as soil and detritus are still attached. The largest specimen differs in colour from the smaller specimen. The material was distributed as Ellis & Everhart, *North American Fungi*: 2nd edition, No. 3510 and care must be taken as some collections are apparently mixed. In Atkinson's type, fragments with large basidiospores (11.5–)13.5–15.5(–16.5) × (9–)9.5–11 μm (Fig. 2H) agreeing with the original description are to be found in addition to fragments of a *Conocybe* with spores considerably smaller (10.5–12(–14) × 7–8(–8.5) μm; Fig. 2J). The basidiospores of the first, taken as type, have enormously thickened walls resembling those of *C. plumbeitincta* (Atkinson) Singer; see below. The cheilocystida are lecythiform with an elongate neck (5–7 μm long) and relatively small head (2.5–4.5 μm diam.) (see Fig. 2I) and the caulocystidia are filamentous and flexuous.

Thus an examination of the type collection demonstrates the common and recurrent problem of a second species of *Conocybe* or *Coprinus* being picked in the field along with the original. Under favourable conditions several coprini may be found on a single dung ball; perhaps another species of *Conocybe* was present on the newly seeded lawn at Middlebury. What this second taxon is one will never know; luckily the description was taken from the large-spored taxon and so the name can stand.

Kühner's material is very different to that of Atkinson's and therefore the name cannot be adopted for the European fungus. The collection from Hb. *Kühner* described by Kühner (1935) has been examined. Sur les bouses des prés 'Le Frehault' près de Luneville. No date but probably ix — x 1934 as indicated in *Le Genre Galera.*

The basidiospores measure 10.5–13 × 7–8(–8.5) μm; the cheilocystidia are lecythiform and caulocystidia lageniform, typical for the *Pilosellae* (see Fig. 2 E-G).

This is not therefore the same as *Galerula neoantipus* Atkinson = *Conocybe neoantipus* Singer in Ann. Mycol. 34: 433 (1936).

Var. **ocracea**

a. 'récoltes macrospores'

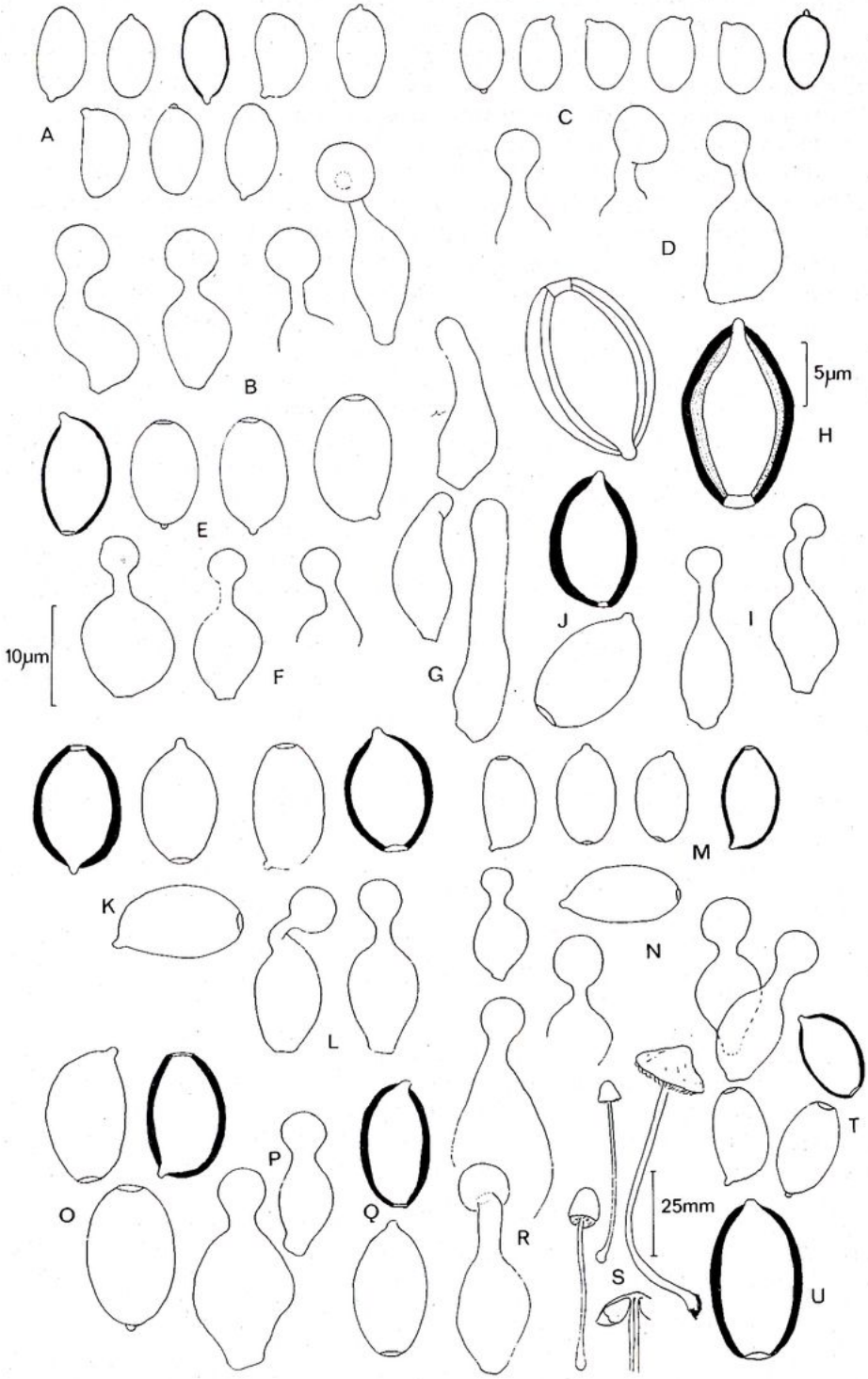
Dans l'herbe des pelouses, des talus ou au bord des sentiers ou des ruisseaux des bois (parfois sous les pins). Bois de Vincennes, Paris, 23 vii 1932.

This collection is *C. kuehneriana* Singer (Singer, 1969). The basidiospores are thick-walled and measure 10–12(–12.5) × 6.5–7.5(–8) μm (Fig. 2 K); the cheilocystidia are lecythiform (Fig. 2 L).

b. 'récoltes microspores'. Fig. 2 M & N.

Souvent dans l'herbe des pelouses; Bois de Vincennes, Paris, 19 viii 1932.

Kühner reports having seen 33 collections amongst which he also records some variation both in macro- and microcharacters. Within the variation


A
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T
U
10µm
5µm
25mm

Agaricus siennophyllus Berkeley & Broome can be fitted thus confirming Singer's interpretation of the type material of that species (Fig. 2T). The type of *Ag. siennophyllus* is based on *Thwaites* 633 from Peradeniya, Sri Lanka (i 1869) in K. As Singer (1955) and Watling & Gregory (1981) indicate, *Conocybe siennophylla* is the correct name for this taxon.

One interesting phenomenon which has been demonstrated in the Bois de Vincennes material is that the germ-pore is very slightly excentric; this is not a common feature of the Bolbitiaceae.

Many authorities (e.g. Dennis, Orton & Hora, 1960; Moser, 1978) have used the epithet 'plumbeitincta' for *Ag. siennophyllus* or part of the concept of *C. siliginea* var. *ocracea*. These authors followed Singer but by 1951 even he drew attention to his earlier errors. *C. plumbeitincta* (Atkinson) Singer is based on *Galerula plumbeitincta* Atkinson but the type material has never been illustrated. In basidiospore structure it can be seen that *C. plumbeitincta* is quite distinct (Fig. 3A); the walls of the spores are extremely complex, a very uncommon phenomenon in the Bolbitiaceae although spores are usually fairly thick-walled. The spores parallel those found in *Conocybe neoantipus* (Atkinson) Singer and *Bolbitius coprophilus* (Peck) Hongo. Ampulliform pileo- and caulocystidia are present and the cheilocystidia are not strictly lecythiform but ampullaceous (Fig. 3B). This confirms Atkinson's original observations. Fresh collections of this taxon are urgently required to classify this species although it is undoubtedly a member of section *Piliferae*.

The descriptive data given by Singer in 1959 and the microscopic information above support *C. plumbeitincta* being an autonomous species.

forma **typica**

a. 'récoltes tétrasporiques'

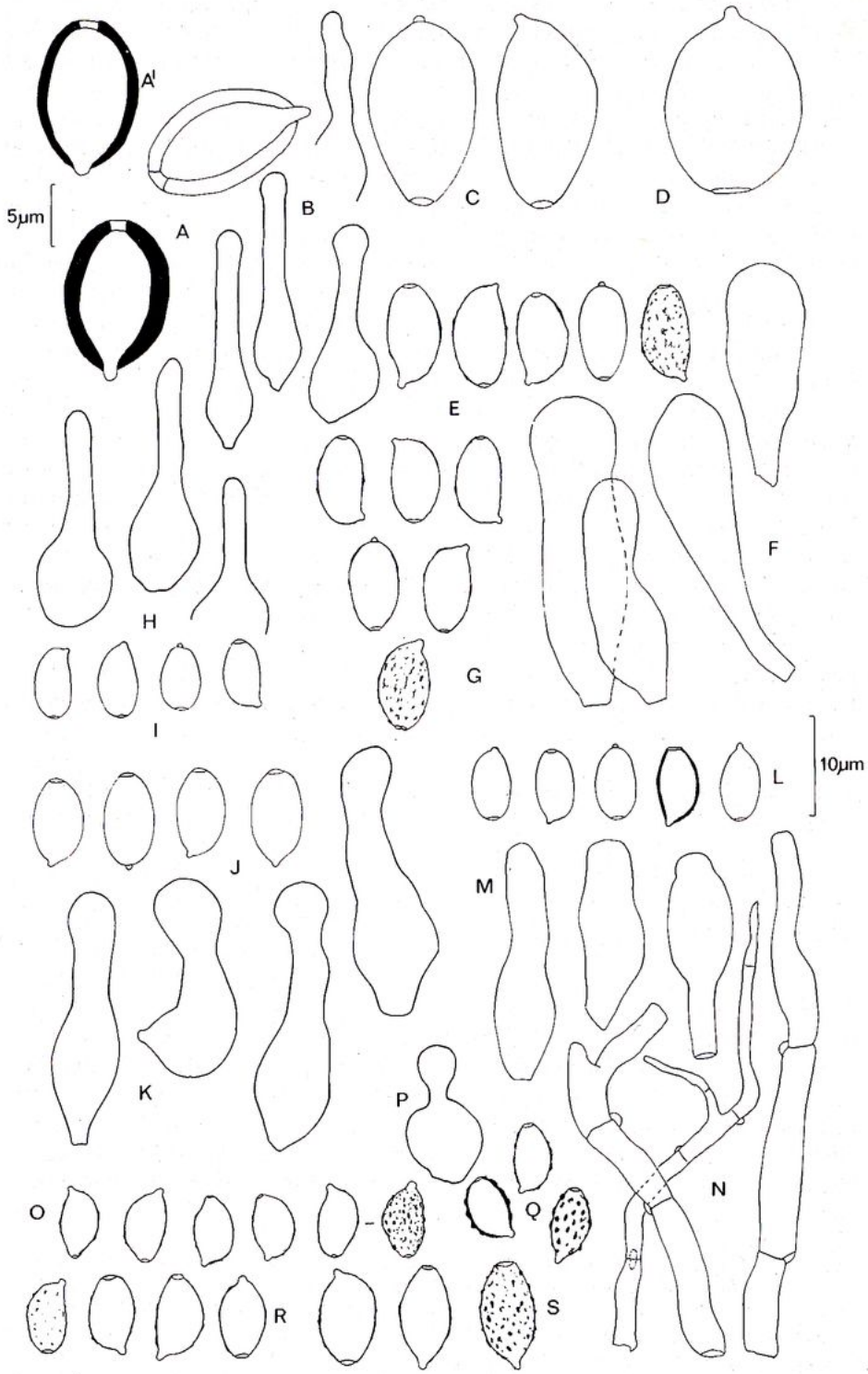
This species is *C. moseri* Watling in *Notes RBG Edinb.* 38: 342 (1980).

b. 'récoltes bisporiques'

Kühner's (1935) description is based on 19 collections of this form but the present author as yet has not seen the material in fresh condition. However an illustrated collection from cucumber-beds in the Netherlands was forwarded to me by Mrs Nan Ernste which agreed with Kühner's taxon except for the non-striate, slightly viscid pileus. The following is a short description.

Pileus 6–23 mm, campanulate becoming conico-convex hardly expanding, greenish glaucous at first or grey-olivaceous buff drying dirty buff or clay-ochraceous flushed with olivaceous buff, non-striate, smooth, slightly viscid. Stipe 53–87 × 1–2 mm, subequal often bulbillose or swollen at base or slightly rooted, whitish at apex, tinged ochraceous or

FIG. 2. Basidiospores and cheilocystidia: A & B, *Conocybe piloselloides*, type; C & D, *C. pilosella*; E & F, *C. siliginea* var. *neoantipus*, Hb. Kühner, Lyon; H & I, *Galerula neoantipus*, type; K & L, *C. siliginea* var. *ocracea* récoltes macrospores, Hb. Kühner, Lyon; M & N, *C. siliginea* var. *ocracea* récoltes microspores, Hb. Kühner, Lyon; O & P, *C. siliginea* forma *typica* récoltes bisporiques, Hb. Kühner, Lyon; Q & R, *C. rickenii* forma tétrasporique, Hb. Kühner, Lyon. Basidiospores: J, atypical spores in type collection of *G. neoantipus* (see text); T, *Agaricus siennophyllus* Berkeley & Broome, type; U, *C. siliginea* 2-spored form, legit N. Ernste. Caulocystidia: G, *C. siliginea* var. *neoantipus* Kühner, as in H & I. S, Habit sketch: *C. siliginea* 2-spored form as in U. Magnification as indicated; H–J at higher magnification.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colour of pileus from base up, or entirely flushed olivaceous buff. Gills adnate usually ventricose, ochraceous then rusty honey, subdistant, broad. Flesh thin. Basidia 2-spored. Basidiospores (13–)13.5–15 × (7–)7.5–9 μm, elliptic in face-view, slightly flattened in side-view, thick-walled, with prominent germ-pore. Cheilocystidia lecythiform 30–35 × 7.0–10 μm, head 2.5–4.5 μm; pleurocystidia absent. Pileipellis a palisadoderm of pyriform to sphaeropedunculate cells. Stipitopellis of parallel, hyaline, cylindric hyphae covered with groups of lageniform or even slightly pointed cells with swollen venter, intermixed with more flexuous cells.

Fig. 2U illustrates the basidiospores of the Dutch material (on rotten straw etc. in cucumber house, Graveland, 8 iii 1976, legit N. Ernste: E. Fig. 2S) and Fig. 2O & P illustrate the basidiospores and cheilocystidia from Kühner's collection ('on soil amongst herbs, sometimes on burnt ground', Boissy St Leger, 22 ix 1929, Hb. *Kühner,* Lyon).

The author is reluctant at present to describe a new species, because of the slight difference in characters of the pileus of the French and Dutch material. However, description will probably be necessary in the future because it is probable that the striation of the pileus comes within the variation seen in other species of *Conocybe* once they have become desiccated and remoistened. Thus Orton (1960) for *C. magnicapitata* Orton writes '. . . . striate when moist but soon drying matt *and most frequently seen non-striate*' — author's italics.

Conocybe siliginea (Fries ex Fries) Kühner as currently accepted is the same as that adopted by J. Lange (1939) and that of the *British Checklist* (Dennis, Orton & Hora, 1960), i.e. a very pale ochraceous-capped taxon inhabiting grassland. It is not the same as either the 2-spored or 4-spored forms noted by Kühner (1935). Several interpretations of *Agaricus siligineus* [Fries ex] Fries are known. For a full discussion see Watling & Gregory (1981) but Bresadola's interpretation needs further explanation. Although his concept is equivalent to *C. rickenii* (J. Schaeffer) Kühner (= *Galera pygmaeoaffinis* (Fries) Quélet sensu Ricken, 1915) Kühner when making the new combination also described a 4-spored form of *C. rickenii,* of which material has been examined.

c. *'C. rickenii* (J. Schaeffer) Kühner forme tétrasporique' in Hb. *Kühner* as '*Conocybe* cf. *rickenii.*'

Although type material of *Galerula fuscimarginata* Murrill has not been examined, Singer's interpretation of the type collection from Gainesville, Florida, USA (12 v 1939, *Murrill* F 15977, FLAS) would agree with the microscopic structures of the collection above. This being the case the correct name for Kühner's 'forme' is *C. fuscimarginata* (Murrill) Singer (*Beih. Nova Hedw.* 29: 210, 1969), although Murrill stated the pileus was isabelline, an unsatisfactory colour term as some authors regard it as

FIG. 3. Basidiospores and cheilocystidia: A & B, *Galerula plumbeitincta,* type; E & F, *Conocybe subnuda* récoltes Algeriennes, type; H & I, *C. peronata,* type; J & K, *C. mutabilis,* type; L & M, *C. blattaria* forma *dentata* Kühner, Hb. Kühner, Lyon; O & P, *C. laricina* récolte — spores banales, Hb. Kühner, Lyon. Basidiospores: A' *C. siliginea* var. *ocracea,* see Fig. 2K; C, *C. ambigua*; D, *C. ambigua* Afghanistan collection, legit R. Singer; G, *C. subnuda* récoltes Parisiennes. Q, *Agaricus martianus,* type; R, *C. missionum,* type; S, *C. radicata,* type. N, Hyphal clothing of stipe in *C. mutabilis,* type. Magnification as indicated; A', A & B at higher magnification.

greyish yellow and others a pinkish cinnamon (Snell & Dick, 1957). A collection from Greenland has been discussed earlier (Watling, 1977b) and British material (Watling, 1982) like Kühner's, had a slightly pinkish cast to the clay-coloured pileus. However, unless members of the genus *Conocybe* are examined fresh then often the subtleties in colour are lost and once dry never return even when the basidiome is remoistened. Microscopic characters must then be relied upon. The basidiospores and cheilocystidia of Kühner's collection (sur crottin dans l'herbe d'un pré 'Le Frehaut' près de Lunéville, ix 1934) are illustrated in Fig. 2Q & R.

7. Conocybe piloselloides

C. pilosella (Persoon ex Fries) Kühner was described in full by Kühner (1935) when he transferred *Agaricus pilosellus* [Pers. ex] Fries to the genus *Conocybe*; he divided the species into two forms based on differences primarily in spore-size.

Unfortunately it is impossible to decide which of these forms should be considered the more typical; indeed the results after examining the old literature tend to blur any decision for adopting the epithet at all.

Fries' *Systema Mycologicum* (1821) is not much help in trying to decide to which agaric the epithet '*pilosellus*' should be attached. It is obvious because of the confusing array of small brown-capped agarics that Fries placed many now autonomous taxa in his circumscription of *A. tener*.

Fries, in *Systema Mycologicum* under *A. tener,* writes:— '*β A. pilosellus* pileo stipitique pilosus . . . Priori tenuior. *Ad trucos udos, in fimo equino* etc.'

By the time Fries had published *Epicrisis* (1838) the description had been expanded with . . . 'idem omino, pube brevi erecta in statu udo tectus meo et omnium (exc. Secretan) sensu est *A. pilosellus* Pers.'

Turning to Persoon one finds this author's description much more useful. He describes *Ag. pilosellus* as '. . . tenellus subferrugineus, pileo campanulato conico subpiloso, lamellis latiusculis, stipite sublongo pubescentes. Antecedenti similis. Stip. subfiliformis unc 1 longus. Pileus praesertium apici, qui obtusus est, pilis obsitus 3 lin. altus, 2 lin. latus.'

Persoon's description must be taken as the protologue of the species and any future discussion referred back to this. It was much later that Atkinson (1912) added basidiospore dimensions to the description based on a collection from the forest floor in a pine-wood (Pontarlier, France). He writes:— 'Gills numerous. Basidia 4-spored, spores 6–8 × 3–4 μm. Stem subtily villose.'

The next stage in the history of this taxon is when Kühner described two quite different fungi within the circumpscription of the taxon *Ag. pilosellus*, one a lignicolous species (A) and the second a terricolous species (B). The following table contrasts the differences of Kühner's two forms (data from Kühner, 1935):—

		A	B
Microscopic characters			
Basidiospores	length	(6.2–)7.2–8.7 μm	5.7–8.2(–9.7) μm
	width	(3.7–)4.2–4.7 (–5) μm	3.5–5 μm (generally 6–7.2 × 3.7–4.5 μm)

Cheilocystidia	length	18–23 μm	16–23 μm
	venter width	7–10 μm	(5.7–)8–8.7 (–11.5) μm
	head diam.	4.2–5(–5.7) μm	(2.5–)3.5–4.5 (–4.7) μm
Macroscopic characters			
Pileus	diam.	13–37 mm	11–24 mm
Stipe	length	40–95 mm	30–60 mm
	width	1.5–3 mm	1–2 mm
	bulb	< 4.5 mm	±3.5 mm
Habitat		on wood	on soil
Number of Collections		4	14
Example examined		Fontainebleau, 21 vii 1932: Fig. 2 C & D	Bois de Vincennes, 17 x 1932: Fig. 2 A & B

Unfortunately basidiospores of neither of these forms of *C. pilosellus* have been germinated nor cultures made, and therefore compatibility tests have not been carried out; it is doubtful from observations in other groups whether such cultures would be in fact interfertile. The small-spored form appears to be the commoner of the two, however, I would propose the adoption of the large-spored form as representing *Ag. pilosellus* of Persoon. *Conocybe* spp. are very rarely found on rotten wood in Europe, although the feature becomes more common in humid subtropical forests and in dense N American forests previously felled and cut-over and now regenerated. However, in Europe this phenomenon is rare if not unknown in any other taxa in *Conocybe* subgenus *Conocybe* and some significance should be placed on the character.

The adoption of the large-spored form as typical is contrary to that proposed by Singer (1936), who found the small-spored form in the Caucasus and took this to represent the type, and the interpretation of Atkinson (1912 — see above). Unfortunately no authentic material exists in the Persoon herbarium in Leiden to clarify this situation.

Kühner's large-spored form has been described in full (Watling, 1982) as *C. pilosella* based on British collections. Kühner's small-spored form, however, requires formal description:—

C. piloselloides Watling, **sp. nov.** Fig. 2A & B.

Pileus 11–14 mm, conico-campanulatus vel conicus, expansus, ochraceo-brunneus jove sicco pallido-ochraceus vel cremeus, jove pluvio striatus, juventute totus villosus. Sporae (5.5–)6.0–7.5(–8) × 3.5–4.5(–5) μm, ellipsoideae, poro absentia. Basidia tetrasporigera, 12.5–20(–25) × 5–7.5 μm. Cystidia aciei lamellarum lecythiformia, 15–20(–25) × 5.5–8.5 μm, capitulis (2.5–)3.5–4.5 μm latis. Stipes et cellulis non capitatis elongato-cylindrica et pilis angustibus longus 1–2 μm latis. Cellulae cuticulae pilei pyriformes vel sphaeropedunculatae 10–25 μm diam.
Typus: Bois de Vincennes, Paris, France, 17 x 1932, *Kühner* (holo. Hb. Kühner, Lyon; slide in E).

C. piloselloides is probably widespread in temperate countries; its distribution, however, is unknown as workers have not separated it from other similar, minutely pubescent species of *Conocybe*. It can be recognized by the small basidiospores lacking a germ-pore and its small size. It grows on soil in grasslands and beside roads and tracks in woodlands especially where there has been an influx of base-rich or nitrogenous material.

CONOCYBE SUBGENUS OCHROMARASMIUS

The subgenus *Ochromarasmius* was proposed by Singer (1947) to accommodate the S American *Conocybe jurensis* (Henning) Singer (=*Naucoria jurensis* Henning in Hedwigia 43: 183, 1904) which combined the characters of roughened basidiospores and a pileipellis composed of a palisadoderm, with a tough stipe. Unfortunately three years later, through an unintentional error, Singer cited *Conocybe pygmaea* (Henning) Singer as the type but no such *Conocybe* exists; it is not *Agaricus pygmaeus* Bulliard per Fries (≡*Psathyrella pygmaea* (Bulliard per Fries) Singer). This error was not listed by Watling & Gregory (1981).

By 1962 Singer had expanded the subgenus to include *C. jurensis, C. macrorhina* (Spegazzini) Singer (≡*Galera macrorhina* Spegazzini in Bot. Acad. Nac. Cienc. Cordoba 11: 426, 1889), *C. martiana* (Berkeley & Curtis) Singer (≡*Agaricus martianus* Berkeley & Curtis in Journ. Linn. Soc. 10: 291, 1869), *C. missionum* Singer (1952) and *C. radicata* Singer (1953). Singer modified the original description of *Ochromarasmius* to include *C. macrorhina* which had larger basidiospores and was in addition not marasmioid.

8. Conocybe laricina (Kühner) Kühner

Watling (1964; 1976) suggested a relationship between *C. jurensis, C. martiana* and the only known European rough-spored *Conocybe* referable to subgenus *Conocybe, C. laricina* (Kühner) Kühner, based on his observation on British material and on collections in Hb. *Kühner*, Lyon (Fig. 4B & C); this treatment was followed by Singer (1975). Kühner (1935) incorporated into his description of *C. laricina* notes on a smooth-spored form 'récolte où j'ai vu des spores banales de *Conocybe* sur les lames et des spores de *laricina* en haut du stipe' (Bois de Vincennes, Paris, 29 ix 1932, *Kühner*, Hb. Kühner, Lyon. Fig. 3P) (Kühner, pers. comm.) and it was considered rather important to determine the true taxonomic position of the form. The basidiospores are not in fact totally smooth but minutely ornamented when viewed by phase contrast microscopy or with dark ground illumination (Fig. 3O). Electron microscope studies confirm this view (Fig. 4D & F). The spores resemble those of *C. laricina, C. missionum* and a closely related taxon found in N America (Gregarious on wet soil in a bushy area, Payette Lake, Idaho, 7 viii 1954, legit E. Kennedy: MICH). The Idaho collection may ultimately be found to be an independent taxon characterized by the papillate pileus and smaller basidiospores (4.5–5 × 3.5 μm as opposed to 5.5–8.5 × 3–4.5(–5) μm in European material and 5.5–7 × 3.75–4.5 μm in other N America material (Michigan): *Smith* 49647 & 63478 in MICH). The variation in spore-ornamentation found in the type of *C. missionum* parallels the variation in Kühner's collections.

Svrček (1956) whilst examining recent collections, in PR, which seemingly represented some of Velenovský's little known species, showed that *Galera dumetorum* Velenovský was in fact the same as *C. laricina* (Kühner) Kühner. He therefore made the necessary transfer and this has been generally accepted. Velenovský's fungus was found under bushes on black humus, and also in grass (Mnichovice, Czechoslovakia), the same kind of habitat it occupies in Britain. In the British Isles it grows on rendzina and similar immature soils on calcareous rocks, often on humus which has gathered in the cracks and crevices of limestone pavements. Although members of subgenus *Ochromarasmius* are said to grow 'on decomposed stumps and chips, more rarely on the ground or needles' (Singer, 1975) the best description of the habit preferences would be highly organic soils and very decomposed woody debris.

C. martiana has been referred to *Galera martiana* by Dennis (1953) under his heading *Galerina*. Hesler (pers. comm.) was not prepared to place the taxon, indicating that the pileipellis was so badly preserved that no structure could be seen. Certainly fresh collections are required to determine the relationships of this fungus as revival of the type in K gives unsatisfactory results; the basidiospores, however, are bolbitiaceous with relatively thick, brown walls and distinctive germ-pore.

The opportunity is taken to figure the basidiospores of *C. dumetorum, C. martiana, C. missionum* and *C. radicata* (Fig. 4 B & C: Fig 3 Q–S respectively). These basidiospores contrast markedly with those of *C. subverrucispora* Veselský & Watling (Fig. 4 A), a taxon placed in subgenus *Piliferae* and *C. subnuda* (Fig. 3 Q–S) in subgenus *Pholiotina*.

Conocybe subgenus Pholiotina

Section Pholiotina

9. Conocybe peronata [Kühner & Maire ex] Kühner & Watling, Fig. 3 H & I.

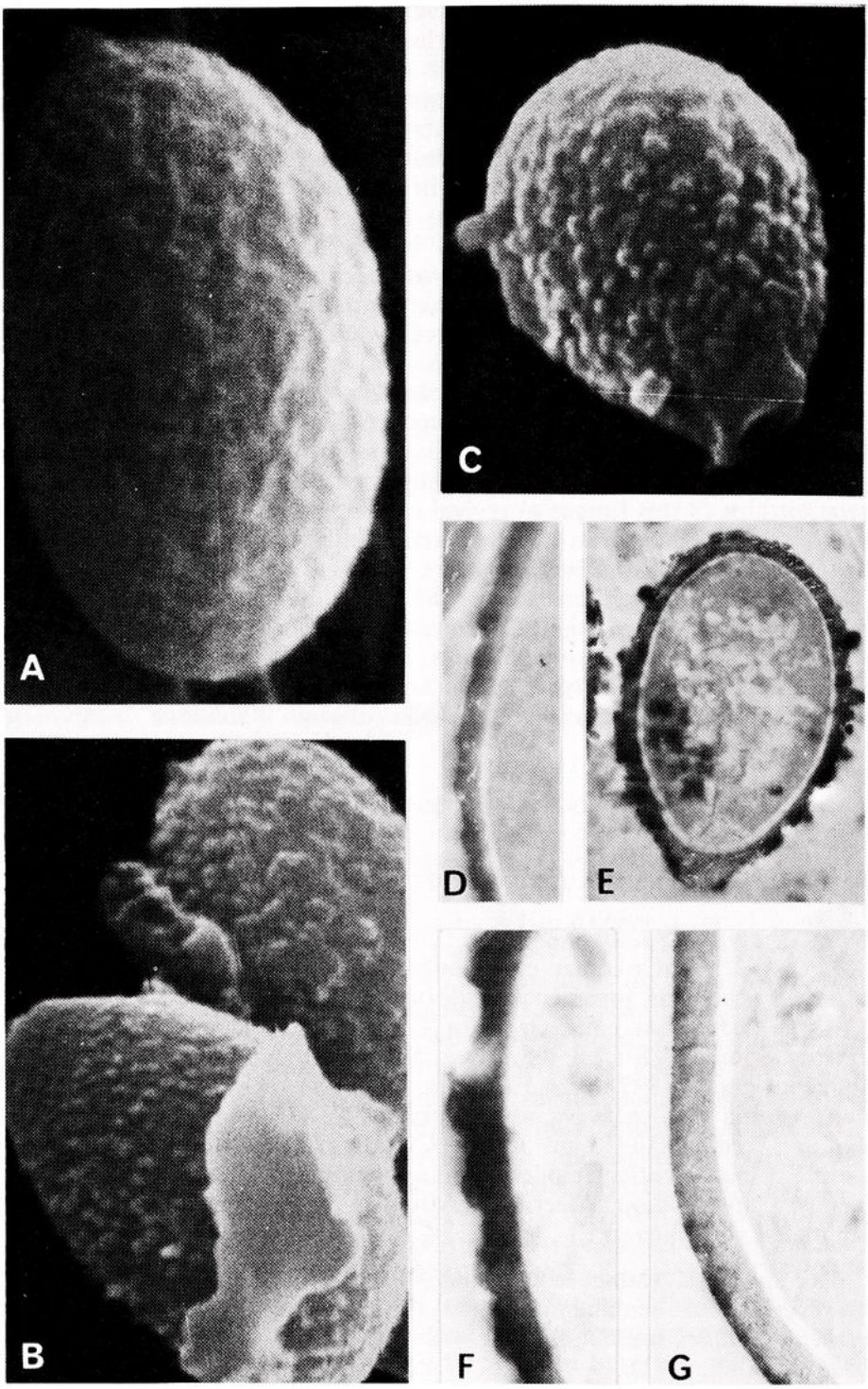
Syn.: *C. peronata* Kühner & Maire, Le Galera 157, 1935, *nomen nudum*.

Pileus 8–27 mm, e conico-campanulato vel convexo expanso-umbonatus, brunneo-ochraceus, jove sicco pallide ochraceus, jove pluvio striatus. Stipes 17–30 × 1.5–4 mm equaliter infra e velo albido, cremeo transversum cinctus. Sporae (7.2–) 7.8–9.5 × 4.2–5.5 μm ovoideo-ellipsoideae. Basidia tetrasporigera, 18–25 × 6.5–7.5 μm. Cystidia aciei lamellarum fere lageniformia cervice breva saepe curvata 24–45 × 8–15 μm ad apicem 2–4 μm, cervice 10–15 μm longa. Cystidia stipitis supra lageniformia similia. Cellulae cuticulae pilei 12–30 μm diam. Fibulae praesens.

Typus: Chréa (Blida), Algeria, N Africa, 8 xii 1932, *Kühner* (holo. Hb. Kühner, Lyon; slide in E).

This species is distinct in subgenus *Pholiotina* in the position of its veil; however, it must be remembered that the ring of many members of the *C. arrhenii* complex becomes mobile with age and can easily fall to the stipe-base (Watling, 1971).

The cheilocystidia in *C. peronata* relate this species to *C. filaris* (Fries) Kühner and *C. vexans* Orton but the basidiospores are smaller than in either of these species.


A
B
C
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E
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G

C. peronata was found in a large troop on the ground under cedars (*Cedrus atlantica*); it has not been recorded since, but as the combination of both microscopic data and macroscopic appearance is unique one has no hesitation in validating Kühner & Maire's name.

10. Conocybe subnuda [Kühner ex] Kühner & Watling, **sp. nov.** Figs. 3 E–G, 4F.

Syn.: *C. subnuda* Kühner, Le Genre Galera 140, 1935, *nomen nudum.*

Pileus 9–19 mm e conico vel convexus, ochraceo-mellinus vel luteo ochraceus vulgo ad discum obscuriore coloratus (ferrugineus), glabrus, jove sicco pallide ochraceus vel pallide cremeus, jove pluvio striatus. Stipes 40–55 × 1.5–2 mm, non-bulbosus. Sporae (8.5–)9–10.5(–13) × 4.5–6 μm rugulosae, ellipsoideae vel leviter amygdaliformes poro minuto germinativo. Basidia tetrasporigera 22–30 × 7–8.5 μm. Cystidia aciei lamellarum fere clavata 25–35 × 3.5–8 μm ad apicem 5–8.5 μm diam. Cystidia stipitis non-capitatis similia. Cellulae cuticulae pilei pyriformes vel sphaeropedunculatae 18–20 μm diam.; pileocystidia rariore.

Typus: Villa des Bois à Alger (Birmandreïs) Algeria, N Africa, 29 xi 1932, *Faurel* (holo. Hb. Kühner, Lyon; slide in E).

C. subnuda was originally based on two collections from two localities, one a troop in a park in Algeria (legit *G. Faurel*) and five collections from amongst dead leaves and humid vegetation in Bois de Vincennes, Paris, France. I have chosen the N African collection as type because the basidiospores are more noticeably ornamented. A collection from N America has been located in MICH (Watling, 1976).

The basidiospores of this species are not only distinctive in shape, being elongate with the germ-pore surmounting a drawn-out apex, but also in that the surface is rugulose, although this can be seen only with difficulty with a ×40 dry microscope objective. The large spores indicated by Kühner are undoubtedly because of the presence in the hymenium of a few two-spored basidia, although no spores greater than 6 μm broad were seen during the present study. The African and European collections agree more closely with each other than with the N American material.

The basidiospores of the French collection appear quite smooth until viewed under the oil immersion objective of an optical microscope with low background illumination; high illumination masks the subtle ornamentation. Indeed Kühner correctly describes the ornamentation as 'à paroi indiscutablement bien que faiblement mouchetée ruguleuse' for the N African collection, as opposed to 'à membrane subtilement ruguleuse' for

FIG. 4. A–C, scanning electron micrographs of basidiospores: A, *Conocybe subverrucispora*: holotype showing irregular surface of exosporae; B, *C. dumetorum*: authentic material of *C. laricina* from Hb. Kühner, Lyon showing irregular coarse and fine verrucae on exosporae; C, *C. dumetorum,* material as in B, showing germ-pore typical of the Bolbitiaceae. D–G, transmission electron micrographs of sections of basidiospores: D & E, *C. dumetorum,* coll. *C. laricina* 'spores banales' Hb. Kühner, Lyon, showing variation in spore-ornamentation; F, *C. subnuda*: holotype showing irregular, ornamented exosporae; G, *C. anthracophila*: holotype showing smooth, thick wall characteristic of members of the Bolbitiaceae. A–C × 12,000; D × 20,000; E × 10,000; F × 30,000; G × 16,000. Preparations A–C by J. Goodall, Dept of Engineering, Univ. of Edinburgh; D–G by A. P. Bennell, Royal Botanic Garden, Edinburgh.

the Parisian collection. Phase contrast microscopy emphasises the minute ornamentation and electron microscope studies show the basidiospores to possess a relatively thin wall, when compared with members of subgenus *Conocybe*, and an irregularly rugulose ectospore (Fig. 4).

Singer (1969) has described *Pholiotina verrucispora* Singer from S America with similar ornamentation, but no fine-structural studies have been carried out on this species. The ornamentation would appear to parallel that figured by Veselský and Watling (1972) for *C. subverrucispora* Veselský & Watling, a species, however, located in subgenus *Piliferae*.

C. subnuda is a rare fungus but probably fairly widespread. In addition to the three original collections, Maire notes another from Algeria (dans les ravins Telemly à Alger; Le Genre Galera 143, 1935) and as noted above a collection has been seen from Wolf's Bay, Michigan, which I believe is the same (near edge of road in wet heap, 24 vi 1947, Smith & Lange, *Smith* 928 MICH) differing only in a small proportion of the basidia being 2-spored.

Kühner does not mention the presence of caulocystidia in his material but, as might be expected, some are in fact found at the stipe-apex. They are irregularly clavate to narrowly utriform, < 35 μm long with head 5–8 μm broad. *Pholiotina australis* Singer described from S America is very close, as indicated by its author, and there may be a possibility that they are conspecific.

Despite the ornamented basidiospores the present taxon is a good species of *Conocybe*. The material lacks any development of a filamentous suprapellis which would be expected if the fungus was related to *Descolea recedens* (Cooke & Massee) Singer, a taxon which should be closely compared (Horak, 1971).

11. Pholiota blattaria sensu Ricken: **Conocybe arrhenii** (Fries) Kits van Waveren

In 1935 Kühner described three infraspecific taxa within *Conocybe blattaria* (Fries) Kühner. Kühner followed Ricken (1915) in his interpretation of *C. blattaria* and this is generally accepted now as being in error. The problems involved in the adoption of the epithet '*blattaria*' for a 4-spored, small-spored, annulate species of *Conocybe* has been discussed at length by Orton (1960) and van Waveren (1970). Luckily there is no confusion in the identity of the fungus Kühner described, as the description offered leaves no doubt that it is *C. arrhenii* (Fries) van Waveren, i.e. *C. togularis* (Bulliard ex Fries) Kühner as adopted in the *New Checklist of British Agarics and Boleti* (Dennis, Orton and Hora, 1960).

C. blattaria forma *dentata,* one of the varieties described by Kühner (1935) is therefore not related to *C. blattaria* as now understood, but to *C. arrhenii.* Indeed during the preparation of a monographic treatment of British annulate species it was considered simply a phenotypic variant of *C. arrhenii* where the velar remains had been almost totally lost. Similar conclusions had been reached by van Waveren (1970) and a possible explanation for the phenomenon has been described earlier by Watling (1971).

The opportunity was therefore taken to examine material of one of the collections cited by Kühner under his description of *C. blattaria* forma *dentata* in an attempt to confirm this hypothesis. The collection was from

Bois de Vincennes, near Paris (29 ix 1932, *Kühner*, Hb. Kühner, Lyon; slide in E: Fig. 3 L & M). The suspicions were confirmed; the material only differs from typical *C. arrhenii* in the veil forming denticles around the margin of the pileus instead of a ring on the stipe; if velar remains are to be found on the stipe they are only fragmentary.

The only difference which can be found is that the germ-pore in the collection of forma *dentata* is marginally larger, and even this is at the limits of resolution of the optical microscope. However, in all other respects the collection agrees with *C. arrhenii* from France (Ozoir-la-Ferrière and Boissy Saint-Léger aux environs de Paris — both in Hb. Kühner, Lyon: Fig. 3E), England (Norfolk, 10 x 1970, *Orton* 3196 in E), and Scotland (Morayshire, 24 ix 1935, *Orton* 615 in E) and with the full description given by van Waveren (1970). Van Waveren has annotated *Orton* 615 in E indicating this material comes within his concept of *C. arrhenii*.

This form was not adopted in *Flore Analytique des Champignons superiéurs de France* (1953) it is obvious he had parallel views. I therefore have no hesitation in reducing 'forma *dentata*' to synonymy of *C. arrhenii*.

Apart from the type variety the second infraspecific taxon described by Kühner (1935) was 'var. *exannulata*' and this has already been elevated to specific rank (Watling, 1980) and provided with a Latin diagnosis. However, in his accompanying observations on the new variety, Kühner draws attention to two forms, one a vernal form, and a second with large spores which is considered below as a distinct species.

The vernal form from Bois de Vincennes near Paris had basidiospores measuring (6.5–)7.2(–8.7) × 4.2–5 μm and lacked a germ-pore. I have collected specimens agreeing with this form in several base-rich, marshy areas in Yorkshire, England. The veil on both stipe and pileus, as Kühner points out, is very much reduced and a distinct ring is lacking. Careful observations at one site showed the velar remnants to be adhering to adjacent herbaceous material. The fungus was in fact *C. aporos* van Waveren with veil disrupted in a way similar to that described above under forma *dentata* and in Watling (1971).

C. aporos differs from *C. exannulata* [Kühner ex] Kühner & Watling in the basidiospores lacking a germ-pore, and from the large-spored form of *C. exannulata* discussed below, by the absence of broadly capitate cheilocystidia.

Material examined: England, Yorkshire, Barden Tower. In open field close to road, obviously previously cleared copse, 29 iv 1961, legit W. D. Graddon, *Watling* G. 73; Barden Tower, in newly planted area in recently felled plantation with *Fagus* and *Acer* in large troops, 29 iv 1961, *Watling* G. 80; *ibid.*, legit T. Hering, 29 iv 1961; Barden Tower, in field amongst marsh herbs close to wood-margin, *Watling* G. 90; Barden Tower, on pathside amongst *Rubus, Mercurialis* etc, under *Fagus* and *Ulmus*, legit A. Bailey, *Watling* G. 82. (all in E).

The large-spored form of *C. exannulata* was originally known from only one locality; it has now been found in other temperate areas. No traces of veil were found, even under a lens, in Kühner's material from near Paris but because of the structure of the gills the collection is considered to be a member of subgenus *Pholiotina* and not subgenus *Piliferae*. However,

fugaceous appendiculate remains of a veil were found on basidiomes of what is considered to be the same fungus from Papoos Creek, Seven Devils, Idaho, North America (on debris, 27 viii 1964, *Smith* 69851, MICH). Formal recognition is made below.

12. Conocybe mutabilis Watling, **sp. nov.** Fig. 3J, K & N.

= *Conocybe blattaria* forma *exannulata* forme 'les spores plus grandes' Kühner, Le Genre Galera 155 (1935), *nomen nudum*.

Pileus 34 mm convexus mox expanso umbonatus ochraceo-brunneus, ad discum obscuriore coloratus, siccitate ochraceus ad discum brunneo-ochraceus. Stipes 35 × 3–5 mm, aequaliter. Lamellae clare luteo-ochraceae. Basidia tetrasporigera. Sporae (9–)9.5–10.5(–11) × 5.5–6.5 μm, ellipsoideae poro germinativo. Cystidia aciei lamellarum fere utriformia, altera clavata ad aciem semper obtusa 35–45 × 6.5–15 μm ad apicem 6.5–10 μm. Cellulae cuticulae pilei pyriformes vel sphaeropedunculatae, 10–20 μm diam.

Typus: Bois de Vincennes, Paris, France, 16 v 1933, *Kühner* (holo. Hb. Kühner, Lyon; slide in E).

Prof. Kühner as well as providing material filed under the manuscript heading '*Conocybe blattaria* forma *exannulata* (forme macrospores)' sent me the appropriate field data from his notes, as these did not accompany his observations published in 1935; these data have been incorporated into the description below.

Pileus 34 mm, convex, very broadly umbonate, hygrophanous, stippled, paling around the ochraceous brown disc to become clear ochre whilst the centre remains brown-ochraceous grey giving to the pileus the appearance of *Galerina mutabilis* (Schaeffer ex Fries) Orton. Stipe 35 × 3–5 mm, hardly attenuated upwards, white to whitish straw-colour, but more or less washed with rust-colour in the lower half, powdered at apex, fibrillose below, brittle, hollow. Gills rather spaced (L = 24; l = 7) and of a rather beautiful yellow-ochre. Flesh thin in pileus, dark red-brown in stipe, honey-colour at extreme apex and white only in cortex; odour vaguely earthy, faint, not acidulous.

Basidia 4-spored, claviform ± distinctly pedicellate. Basidiospores (9–)9.5–10.5(–11) × 5.5–6.5 μm, elliptic in face- and side-view, truncate, with a distinct germ-pore. Cheilocystidia forming a distinct heteromorphic margin, irregularly cylindric to even torulose or utriform, inflated below with slightly to distinctly swollen heads, 35–45 × 6.5–15 μm, with head 6.5–10 μm; pleurocystidia absent. Clamp-connections present.

Traces of veil were found neither on the pileus nor the stipe even under a lens. However, because of the similarities in cystidial morphology, presence of caulocystidia at the very apex of the stipe and not below, the white fibrillose cortex of the lower part of the stipe and the basidiome structure, this taxon must be a member of subgenus and section *Pholiotina*.

C. mutabilis is to *Conocybe exannulata,* as *C. hadrocystis* (van Waveren) Watling is to *C. arrhenii*. The first of each pair have swollen headed cheilocystidia and the second of each pair have long lageniform cystidia. The cheilocystidia of *C. mutabilis* resemble those of *C. utriformis* Orton. The basidiospores, apart from being larger in size, are much more thick-walled in *C. mutabilis* than *C. exannulata*.

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Printed in the UK for HMSO, *Dd.* 735580/4264 3/83 (Contractors Job No.)