OBSERVATIONS ON THE BOLBITIACEAE

I. A NEW SPECIES OF CONOCYBE

R. WATLING

Conocybe subgenus *Conocybe* sect. *Mixtae* has confused many, in fact even Kühner (1935) misinterpreted *Galera pubescens* Gillet (1874) when monographing the European members of the genus. Fourteen years later he corrected this after he had studied an authentic collection which he grew on dung in damp chambers. He renamed, but invalidly, the collections he had at first attributed to Gillet's species. 23 names are available for species attributable to this complex but even after the careful examination of their descriptions scattered through the literature it is found necessary to describe a new taxon, *Conocybe farinacea*.

C. farinacea differs from all well known species in the *C. pubescens* complex in the extremely strong mealy taste and smell, the large number of irregularly lecythiform or capitate—subcapitate cells on the stipe and the way the pileus frequently expands to become umbonate. It also differs from *C. pubescens* (Gillet) Kühner in the smaller spores, from *C. subpubescens* Kühner ex Orton (1960) in habitat and less distinctly bicoloured stipe and from *C. pseudopilosella* (Kühn.) K. & R. (nomen nudum) (1953) in spore size, less slender stature and habitat.

This new taxon approaches very closely *C. bulbifera* (Kauffm.) Romagnesi (1942) in Kauffmann's original sense but his description of that species records distinctly the absence of an odour (1918). The habitat is very close, i.e. horse dung in woodland, and the examination of photographs of specimens named by Buller (1933) certainly indicates an agaric of a similar facies. Further observations are very necessary on these North American collections. Rea (1922) may have included this species amongst others in what he called *Galera pilosella* (Pers. ex Fr.) Rea. Neither *C. umbellula* (Mont.) Singer nor *C. megalospora* (Schaeff.) Singer (1962) can be considered the same as the present taxon and it is considered prudent to keep it separate also from any 2-spored species referable to the group e.g. *Galerula cryptocystis* Atk. and *G. macrospora* Atk. (1912).

C. farinacea R. Watling, **sp. nov.**

Pileus 8–35 mm., campanulate, convex, or conico-convex often expanding, frequently slightly umbonate, tawny ochre or honey, drying ochraceous, honey or buff, striate when moist but only at margin at first, finally striate almost to disc, entirely pubescent when mature. *Gills* adnate, ventricose or linear, pallid, then honey buff, finally rusty brown, fairly crowded, edge paler and minutely flocculose when fresh. *Stipe* 58–135 mm. × 1·5–3·5 mm. (base < 5 mm.) hollow, equal, with distinct bulb at base, whitish ochraceous at first then reddish honey or rusty ochre in lower part, sometimes entirely so but for extreme apex, pubescent and conspicuously pruinose striate to the base. *Flesh* thin, concolorous. *Smell* strong, mealy. *Taste* strong, mealy. *Spores* smooth, ellipsoid with distinct, large germ-

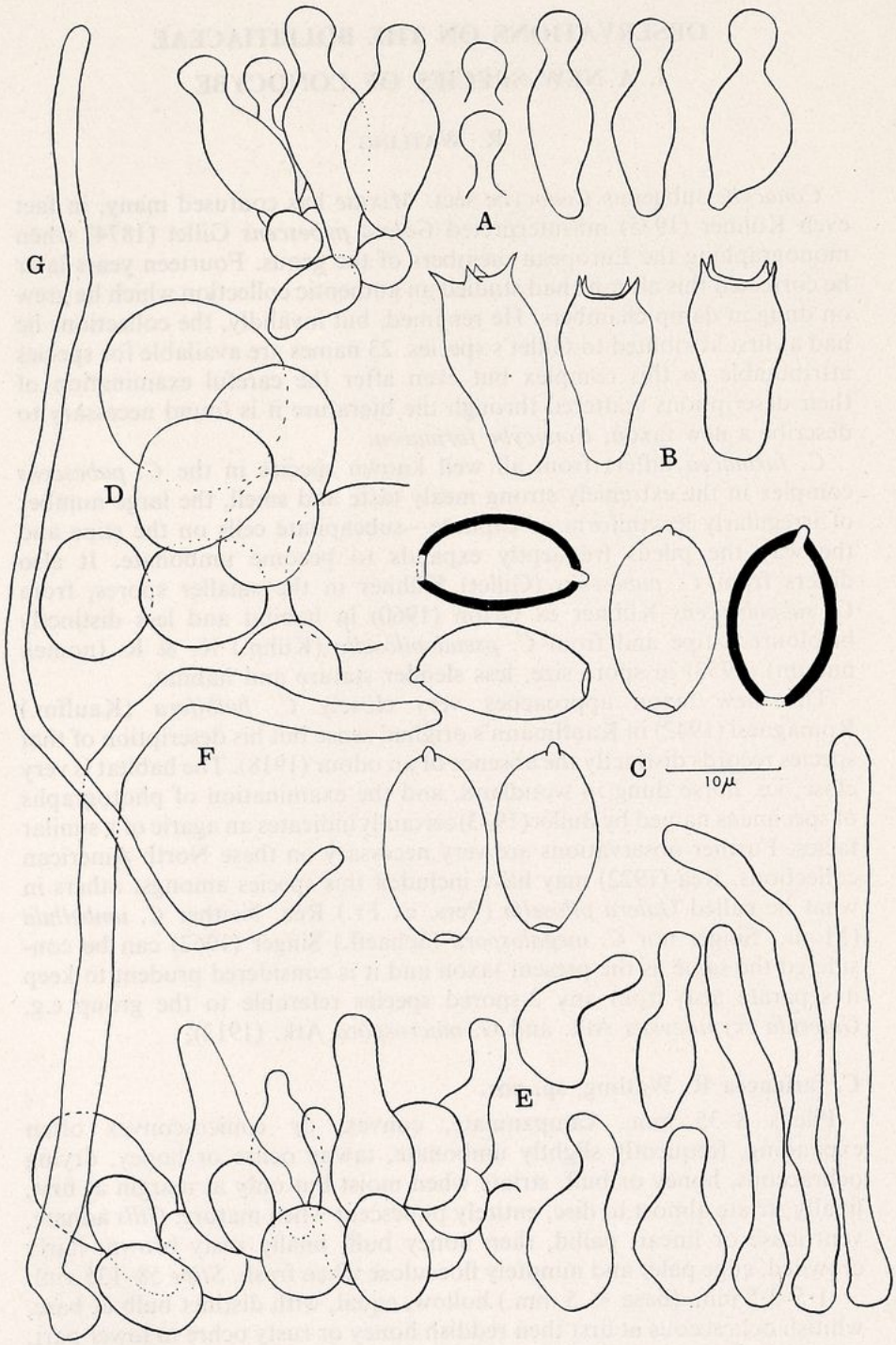

FIG. 1. Microscopic details of *Conocybe farinacea:* A. cheilocystidia; B discharged. basidia; C. basidiospores; D. tangential section of pileus epicutis; E. caulocystidia; F. hair of pileus; G. hair of stipe.

pore 11–14 × 7–9 μ. *Basidia* 4-spored claviform or obconic-clavate 20–27 × 8–10 μ. *Cheilocystidia*, lecythiform, body 7–7·5 μ, head 3–4 μ, neck 1·5–2 μ. The stipe has long narrow hairs, 1·5–2·5 μ in diameter, as well as similar cells to those on the gill edge and/or elliptical, subglobose, non-capitate and slightly capitate cells. The pubescence of the pileus is due to long narrow hairs 1–2 μ in diameter.

On dung (horse?), Black Wood of Rannoch, Perthshire, 6 Oct. 1960 (type in Herb. Edinburgh); on horse dung, Edinburgh, 10 Nov. 1961; on horse dung, under *Pinus*, Rothiemurchus, Inverness-shire, 4 Sept. 1960.

Pileus 8–35 mm. primo campanulatus, convexus vel conico-convexus, denique saepe expansus, frequenter prope umbonatus, fulvo-ochraceus vel fulvo-mellinus, siccitate ochraceus, mellinus vel luteolo-brunneus, statu madido striatus sed primo tantum margine deinde fere ad discum, statu maturo omnino pubescens. Lamellae adnatae, lineares vel ventricosae primo sordidae mellino-vel luteolo-brunneae, denique ferrugineo fuscae, subconfertae 1–3 (lamellulae) ad aciem juventute pallidiores minute flocculosae. Stipes 58–135 mm. × 1·5–3·5 mm. aequalis, ad basim cum bulbo distincto (> 5 mm.) primo albido-ochraceus denique ferrugineo-mellinus, interdum omnino ferrugineus apice excluso, pubescens et conspicue pruinoso-striatus ad basim. Caro tenuis, concolor. Odor farinaceus, praesertim carne secta validus. Sapor valde farinaceus. Basidiosporae ellipsoideae 11–14 × 7–9 μ poro germinativo distincto. Basidia 4-sporigera claviformia vel obconico-clavata 20–27 × 8–10 μ. Cheilocystidia lecythiformia, venter 7–7·5 μ, capitulum 3–4 μ et collum 1·5–2 μ. Stipes similibus lecythiformibus et ellipsoideis, subglobosis, non-capitatis et leviter capitatis et pilis angustis longis 1·5–2·5 μ latis cellulis obtectus. Pileus pilis angustis longis 1–2 μ latis obtectus.

In fimo, Black Wood of Rannoch, Perthshire, 6 Oct. 1960 (typus in Herb., Edinburgh) A *C. farinacea C. pubescens* a sporis majoribus et nullo, farinaceo odore, *C. pseudopilosella* graminicola, sporis majoribus, statura graciliore et *C. subpubescens* humicola tametsi cum sporis similibus differt.

The development of this new species of *Conocybe* is paravelangiocarpic, (Reijnders, 1952) agreeing in most points with that described for *C. pubescens* by Kühner (1949) and for the agaric referred to by Reijnders as "C. pubescens?" The very distinct bulbous base, however, suggests a tendency towards the gymnangiocarpic development exhibited in *C. hebelomatoides* Middlehoek et Reijnders. (1952).

Mating experiments with isolates of *C. farinacea* have shown that in addition to the morphological differences the species is incompatible with isolates of its nearest relatives *C. pubescens*, *C. pseudopilosella* and *C. subpubescens*. All the differential characters, including taste and smell, were present in culture.

References

ATKINSON, G. F. (1918). The genus *Galerula* in North America, *Proc. Amer. phil. Soc.*, **57**, 357–374.

BULLER, A. H. (1933). Researches on Fungi, Vol. V., London.

GILLET, C. C. (1874). Les Champignons de France, Alençon.

KAUFFMAN, C. H. (1918). Agaricaceae of Michigan, Lansing.

KÜHNER, R. (1935). Le Genre Galera, Encyclopedie Mycologique VII, Paris.

—— (1949). *Conocybe pubescens* et le développement de son carpophore, *Le Botaniste*, Series XXIV, Fasc. I-VI, 275–281.

—— & ROMAGNESI, H. (1953). Flore analytique des champignons supérieurs, Paris.

MIDDLEHOEK, A. & REIJNDERS, A. F. M. (1952). Appendix to Reijnders paper (see below).

ORTON, P. D. (1960). New check list of British Agarics and Boleti, Part III, *Trans. Brit. mycol. Soc.*, **43,** 159–439.

REA, C. (1922). British Basidiomycetae, Cambridge.

REIJNDERS, A. F. M. (1952). Recherches sur le développement des carpophores dans les Agaricales, Meded. ned. mycol. Ver., **30,** 1–113.

ROMAGNESI, H. (1942). Description de quelques espèces d'agarics ochrosporés *Bull. Soc. mycol. France*, **58,** 121–149.

SINGER, R. (1962). The Agaricales in modern taxonomy, Weinheim.