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TROPICAL AFRICAN AGARICALES

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(With 146 Text-figures)

The paper presents a study of fifty-one species of agarics which have been collected within the tropical regions of Africa, particularly Uganda. Type-studies are made of species described by Beeli, Bresadola, Hennings, and Patouillard. The following eleven species are described as new: *Agaricus exilis, Clitocybe hydrophora, Coprinus africanus, Crinipellis calderi, Galerina makereriensis, Marasmiellus roseotinctus, Marasmius bubalinus, Melanoleuca tropicalis, Pluteus brunneisucus, Psathyrella glandispora.* One new variety is proposed: *Conocybe ochracea* var. *africana.* The following nomina nova are proposed: *Clitocybe torrendii* and *Xerulina deseynesiana.* New combinations are made in the following genera: *Agaricus* (1), *Crinipellis* (1), *Cystoderma* (1), *Gymnopilus* (1), *Hohenbuehelia* (1), *Limacella* (1), *Macrolepiota* (1), and *Marasmiellus* (1).

During the summer of 1964, Dr. E. A. Calder, assisted by Mr. A. Ojong, who were attached to the Makerere University College, collected a large number of agarics in the Mpanga Forest area of Uganda. These fungi, together with water-colour illustrations, field-notes, and spore-prints were subsequently sent to the Herbarium, Royal Botanic Gardens, Kew for the purposes of identification. In an attempt to determine the correct names for these fungi, an exhaustive effort was made both in the search of available literature, and in the examination of existing type-material. However, it soon became clear that a number of species new to science were represented. This is hardly surprising for although a number of works have been produced concerning the Aphyllophorales of tropical East Africa, the agaric flora remains virtually unknown.

The purposes of this paper are to describe a number of these new species, and to give detailed analyses of the type specimens of some of the taxa which have been described in other tropical areas of Africa. Particular attention has been given to those species described by Bresadola, Hennings, and Patouillard, but much of this material, especially that of Hennings, has been either lost or poorly preserved. Further, specimens collected by Mr. F. C. Deighton and determined by Beeli, have been examined. The conclusion reached from these studies must be that a rich, unknown, agaric flora exists in tropical Africa, and it is hoped that this present paper will help to stimulate further mycological explorations.

Every attempt has been made here to adopt Singer's (1962) system of classification, for the interpretation of genera, subgenera, and sections. All the material examined microscopically has been mounted either directly in 10 % potassium hydroxide

solution, or in 1 % aniline blue in 50 % lactic acid after an initial soaking in potassium hydroxide. Wherever possible spore-measurements have been based upon samples taken from spore-prints, and are expressed both as a range and with a mean value. The text-figures of microscopic structures have been drawn with the aid of a camera lucida, and then reduced on reproduction. The habit sketches are taken from water-colour illustrations of the fresh material, painted by Dr. E. A. Calder, and it is with his kind permission that these are reproduced in this paper. The colour terminology is taken from Ridgway's "Color Standards and Color Nomenclature", 1912. Type specimens, field-notes, and water-colour drawings of the newly described species are deposited in the Kew Herbarium. Material deposited in other herbaria is indicated by the abbreviations used by Lanjouw & Stafleu (1959).

For kindly making available collections in their keeping I wish to thank the following: Dr. C. R. Benjamin (BPI); Mr. F. C. Deighton (IMI); Prof. R. Heim (PC); Dr. I. Mackenzie Lamb (FH); and Dr. T. Norlindh (S). I should also like to express my thanks to Mr. H. K. Airy Shaw for correcting the Latin diagnoses.

AGARICACEAE Fr.

Agaricus exilis Pegler, *sp. nov.*—Text-figs. 1–4

Pileus 4–15 mm latus, e convexo expansus, planus vel obtuse umbonatus, carnosulus, ad discum fuscus, ad marginem pallide bubalinus, squamulis adpressis ± concentricis variegatus. Lamellae liberae, primo albidae dein atrofuscae, confertae, ad aciem pallidiores, subtiliter serratae. Stipes 2–5 cm × 1.5–3 mm, aequalis, cylindricus, cavus, interdum ad basim bulbillosus, laevis, sericeo-albus; annulus peronatus, ferrugineus, distincte membranaceus. Caro tenuissima, albida, fracta rubescens. Sporae 4–5 × 3–3.7 (4.7 × 3.3) μ, late ellipsoideae, sub micr. fuscobrunneae, tenuitunicatae. Basidia 11.5–16.5 × 4.5–5.5 μ, claviformia vel cylindrica, 4-sporigera. Cheilocystidia 20–32 × 9.5–16 μ, vesiculosa, piriformia, tenuitunicata, brunnea. Pleurocystidia nulla. Trama hymenophoralis subregularis pallide brunnea. Hyphae cuticulae pilei brunneae, rugosae, ad 9 μ diam. inflatae. Hyphae defibulatae.

Inter radices, sub frutice. Mpanga 69, Makerere University College, Uganda. Alt. 4,300 ft. 13 April 1964. Legit *E. A. Calder*, no. *41* (Typus).

Pileus 4–15 mm diam., convex then expanded ± plane or with a low obtuse umbo, thin, 'Fuscous' at the disc, becoming 'Light Buff' towards the margin, with numerous small, 'Tawny', appressed scales arranged concentrically around the umbo; margin not noticeably striate. *Lamellae* free, at first white, soon becoming deep fuscous, linear, crowded with numerous lamellulae; edge paler brown, slightly serrate. *Stipe* 2–5 cm × 1.5–3 mm, equal, cylindric, slightly swollen at the base or not, hollow, smooth silky white; bearing a well developed and persistent, peronate annulus, 5–10 mm from the apex, reddish-brown, membranous. *Context* very thin, pale to concolorous, inamyloid, when cut rapidly changing to reddish-brown. *Spores* 4–5 × 3–3.7 (4.7 × 3.3) μ, broadly ellipsoid, under the microscope fuscous brown, thin-walled without any apparent germ-pore, usually containing a single large oil guttule; no noticeable dextrinoid reaction with Melzer's solution. *Spore print* not available. *Basidia* 11.5–16.5 × 4.5–5.5 μ, claviform to cylindric, bearing 4 short sterigmata. *Cheilocystidia* present, 20–32 × 9.5–16 μ, piriform to pedicellate, with a thin brown wall; numerous on some lamellae, rare on others, intermixed with the basidia to

form a heteromorphous gill-edge. *Pleurocystidia* absent. *Hymenophoral trama* subregular, pale brown, consisting of loosely interwoven hyphae, 1.5–6 μ diam., thin-walled, septate, occasionally branched. *Pileus surface* an epicutis which becomes much fragmented towards the apex, consisting of repent to suberect, loosely arranged hyphae, inflated up to 9 μ diam., but often much constricted at the septa, thin-walled either with a brown membrane pigment or hyaline, branched, surface varying from smooth to rugose. Individual elements 18–50 μ long; the terminal elements are cylindric with a rounded apex. No sphaerocysts. All hyphae devoid of clamp-connexions.

In a dense root complex at the base of a spreading bush. Mpanga 69, Makerere University College, Uganda. Alt. 4,300 ft. 13 April 1964. Legit *E. A. Calder*, no. *41* (Type).

The small fragile species of *Agaricus* L. ex Fr., although apparently of frequent occurrence in the tropics have been little investigated. The question arises as to whether they should be regarded as congeneric with the more typical, large, fleshy species, and if *Micropsalliota* Höhn. might be a more suitable genus for these species. However Singer (1947) reporting on the type species, *Micropsalliota pseudovolvulata* Höhn., observed that the spores are only pale-coloured and give a positive dextrinoid (pseudoamyloid) reaction when subjected to Melzer's solution, strongly suggesting the genus *Lepiota* (Pers. ex Fr.) S. F. Gray. *Agaricus exilis* has spores which appear very dark brown under the microscope, and in no way fit the pale colour range found within *Lepiota*.

In an attempt to find the possible relationship for the Uganda species, the present author examined a number of type specimens of species described from Ceylon by Berkeley & Broome (1871). Several small species were described within this genus, and some of the water-colour illustrations which accompany the type material closely resemble the African fungus. In particular, *A. epipastus* Berk. & Br. shows the same gregarious habit, and scaly pileus, but differs in having an olive-yellow stem which is also covered with scales; an epicutis with abundant sphaerocysts; and narrower, subcylindric spores (4–5.5 × 2.5–3 μ). *Agaricus myriostictus* Berk. & Br. though not gregarious is otherwise similar in habit, but again is provided with numerous sphaerocysts in the epicutis, and has smaller spores (3.5–4.3 × 2.5–3.2 μ). Another gregarious species, *A. subcitrinus* Berk. & Br. differs in the more yellowish coloration, shorter stem, and the presence of epicuticular sphaerocysts, yet the spores are identical in size (4–5 × 3–3.7 μ) to those of *A. exilis*. *Agaricus celidotus* Berk. & Br. also has very similar spores, but this is a far more robust species, and the epicutis, although filamentous, consists of thick-walled hyphae with pigmented vacuolar contents, which are arranged in a general radial direction.

Agaricus exilis would appear to belong in the subgenus *Conioagaricus* Heinem. by virtue of the thin, squamulose pileus, and the inflated, incrusted elements of the epicutis. The majority of species within this group are characterised by the presence of sphaerocysts, but in *A. latericolor*, described by Heinemann (1956) from the Congo, those structures are only produced to a limited extent. They are totally absent in *A. exilis*, but all the other micro-characters of this species are in close agreement with *A. latericolor*.

Agaricus murinaceus (Beeli) Pegler, *comb. nov.*—Text-figs. 5–7

Hypholoma murinaceum Beeli *in* Bull. Jard. bot. État Brux. **15**: 41, pl. 3, fig. 28. 1938 ("*murinacea*", basionym).

Pileus 2.5–3 cm diam., convex then expanded, broadly umbonate, surface pale grey, covered by small sepia brown, suberect squamules; margin striate, undulate. *Lamellae* more or less free, dark sepia, fairly broad (up to 5 mm), crowded with lamellulae; edge white, pruinose. *Stipe* 25–30 × 3–4 mm, equal, cylindric with a sub-bulbous base, hollow, smooth, white or pale greyish; annulus not observed. *Context* thick, white. *Spores* 4.8–6.5 × 3.4–4.7 (5.5 × 4) μ, ovoid to short ellipsoid, fuscous brown under the microscope, smooth, thick-walled, without a germ-pore. *Spore print* dark fuscous. *Basidia* 14–18 × 5–6.5 μ, oblong to short claviform, with 2 or 4 sterigmata (up to 4 μ long). *Cheilocystidia* numerous, 10.5–16.5 × 4–8 μ, ovoid, cylindric, or short lageniform, hyaline, thin-walled. *Pleurocystidia* absent. *Hymenophoral trama* regular or nearly so, pale brown, but with a well developed hymenopodium of broadly inflated elements, to appear falsely bilateral. Subhymenial layer well developed, subcellular. *Pileus surface* a fragmented epicutis, consisting of repent, brown, thin-walled hyphae, 5–10.5 μ diam., frequently branched and septate, often with brown, granular contents. All hyphae devoid of clamp-connexions.

On the ground. Njala, Sierra Leone. July 1935. Legit *F. C. Deighton*, no. *M 762* (Type).

The type collection consists of a single sporophore preserved in alcohol which on analysis is found to represent a species of the genus *Agaricus*. The poor development of a veil, and the flesh context indicate that this species probably belongs within the section *Agaricus*.

Cystoderma ferruginosum (Bres.) Pegler, *comb. nov.*—Text-figs. 8–9

Lepiota ferruginosa Bres. *in* Annls mycol. **18**: 26. 1920 (basionym).

Pileus 4–5 mm diam., at first convex, obtusely umbonate, then becoming depressed around the umbo, fulvo-ferruginous, surface granular-mealy, glabrescent. *Lamellae* adnexed, concolorous, thin, crowded; edge even. *Stipe* 10 × 0.5 mm, equal, cylindric, hollow, ferruginous, pruinose, bearing a fibrillose evanescent annulus. *Context* thin, concolorous, inamyloid. *Spores* 4–5.2 × 2–3.2 (4.6 × 2.5) μ, ellipsoid to oblong-ellipsoid, hyaline, thin-walled; strongly amyloid. *Basidia* 13.5–20 × 4–5 μ, claviform, bearing 4 short sterigmata. *Cystidia* absent. *Hymenophoral trama* regular or nearly so, hyaline, inamyloid. *Pileus surface* an epithelium of brown, inflated sphaerocysts, 12–25 μ diam., globose to pedicellate piriform, thin-walled, smooth, sometimes forming short chains. Similar elements occur on the stipe though somewhat sparse, and often more elongate (up to 45 μ long). All hyphae provided with clamp-connexions.

EXPLANATION OF FIGURES 1–13

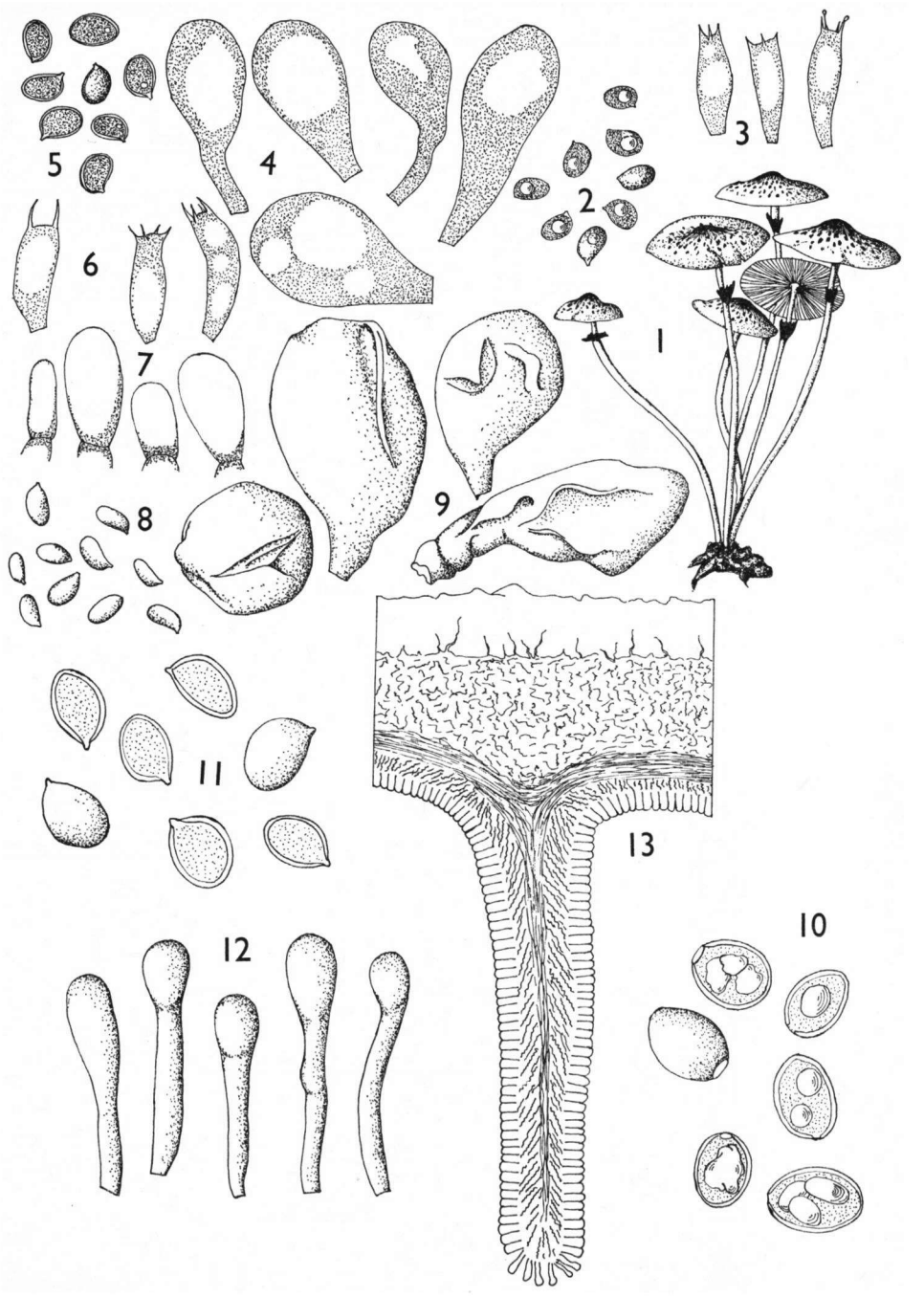
Figs. 1–4. *Agaricus exilis.* — 1. Habit of sporophore (× 2). — 2. Spores. — 3. Basidia. — 4. Cheilocystidia.

Figs. 5–7. *Agaricus murinaceus.* — 5. Spores. — 6. Basidia. — 7. Cheilocystidia.

Figs. 8, 9. *Cystoderma ferruginosum.* — 8. Spores. — 9. Epithelial sphaerocysts.

Fig. 10. *Macrolepiota imbricata.* Spores.

Figs. 11–13. *Limacella rhodopus.* — 11. Spores. — 12. Basidioles. — 13. Vertical section through pileus and gills (× 100). (All × 1000 unless otherwise stated.)



Figs. 3—13

On marshy ground. Wombali, Congo. Nov. 1913. Legit *H. Vanderyst* (S, type).

The above description is based upon Bresadola's original diagnosis, with the addition of some microscopical details obtained by the present author on examination of the type collection. The epithelium of the pileus surface, and the smooth, amyloid spores, clearly place this minute species within the genus *Cystoderma* Fayod. It may be distinguished from the other known species in the section *Cystoderma* by the colour and habitat of the sporophore.

Macrolepiota imbricata (P. Henn.) Pegler, *comb. nov.*—Text-fig. 10

Lepiota imbricata P. Henn. *in* Hedwigia **34**: 333. 1895 (basionym).

Adi-Quieh, Ethiopia. Alt. 2,000 m. 12 May 1894. Legit *G. Schweinfurth* (S, type).

The type collection consists of a well preserved sporophore with thick, imbricate scales on the pileus surface, and a glabrous stipe. It approcaches very closely to *Macrolepiota rhacodes* (Vitt.) Sing. in many respects but differences occur in the shape and size of the spores; the two species are therefore regarded as distinct. The spores of *M. imbricata* measure 10.3–13.5 × 8–9 (11 × 8.3) μ, and constantly show a germ-pore though this is never truncate, so that the spore outline ranges from subglobose to broadly ellipsoid. The spores of European material of *M. rhacodes* are distinctly truncate, and generally narrower (9–12 × 5.5–7 μ).

AMANITACEAE Roze

Limacella rhodopus (Bres.) Pegler, *comb. nov.*—Text-figs. 11–13

Marasmius rhodopus Bres. *in* Annuar. R. Ist. Bot. Roma **5**: 175, pl. 8, fig. 2. 1893 (basionym).

Pileus 10–30 mm diam., at first convex then expanded depressed, sometimes broadly umbonate, thin, yellowish-white, rugulose, glabrous; margin incurved, pellucid striate. *Lamellae* adnexed to free, greyish-white becoming stramineous, subdistant, lamellulae present but no interveining. *Stipe* 2–3 cm × 1.5—4 mm, equal or attenuated towards the base, somewhat compressed, fistulose, reddish-fuscous fading to white at the apex, sulcate, pulverulent. Membranous annulus or glutinous belt not recorded. *Context* hyaline, inamyloid, consisting of two well defined layers. The upper layer, 130–250 μ thick, is strongly gelatinized with loosely arranged hyphae, 1–3 (–5) μ diam., embedded in a hyaline matrix; the walls of most of the hyphae have lost their identity. Occasionally the uppermost hyphae of this layer are arranged vertically and penetrate for a short distance into the surface pellicle. The lower layer forms a narrower zone, 35–45 μ thick, and is non-gelatinized, consisting of horizontal, more or less parallel hyphae, which may be inflated (up to 10.5 μ diam.). The hyphae of this layer are continuous with the mediostratum of the lamellae. *Spores* 9–11.5 × 6.5–8.2 (10.3 × 7) μ; broadly ellipsoid, hyaline or with a slight yellowish tint in the dried material, wall distinctly thickened, smooth, contents staining deeply in aniline blue in lactic acid, inamyloid. *Basidia* 25–38 × 8–9.5 μ, claviform, bearing 4 sterigmata (up to 5 μ long). *Cheilocystidia* and *pleurocystidia* absent. *Basidioles* 25–37 × 3–6.5 μ, present on the gill-edge, cylindric with a subcapitate apex, projecting, hyaline, not staining as deeply as the basidia.

Hymenophoral trama bilateral, hyaline, consisting of a non-gelatinized mediostratum of thin-walled hyphae, 5–12 μ diam., and strongly gelatinized lateral strata in which the walls of the hyphae are indistinct. Subhymenial layer well developed, cellular. *Pileus surface* covered by a broad gelatinized pellicle, 45–85 μ thick, hyaline, amorphous. All hyphae provided with clamp-connexions, which are often small and inconspicuous.

On wood, Fekerie-Ghemb Forest, Shoa Mountains, Ethiopia. Legit *V. Ragazzi* nos. *10*, *13* pr. p. (S, type).

This species does not fall readily into any of the accepted genera of hyaline-spored agarics, however the combination of a bilateral trama in the gills, and the extensive gelatinization would strongly suggest that it belongs in *Limacella* Earle. The most striking feature is the very thick, gelatinous pellicle which covers the entire surface of the pileus, the few vertical hyphae which penetrate this layer might be regarded as representing the remnants of a trichodermium. The large dimensions of the spores are an atypical feature for the genus, although *L. oaxacana* Sing., described from Mexico, is stated to have spores which measure 7.3–10.5 × 5.8–8.5 μ Furthermore the similarity in the high altitude localities of these two species would indicate that they may be fairly closely related within this essentially temperate genus.

Pluteus brunneisucus Pegler, *sp. nov.*—Text-figs. 14–19

Pileus 30 mm diam., e convexo expansus, obtuse umbonatus, atro-umbrinus vel niger, radialiter innato-fibrillosus, ad marginem carne pallidiore exposita. Lamellae liberae, late ventricosae, sordido-incarnatae; ad aciem atrobrunneae, interdum concolores. Stipes 60 × 6 mm, aequalis vel ad basim leviter incrassatus, cavus, ad apicem pallido-griseus,apice excepto squamulis fibrillosis, atrobrunneis totus obtectus. Caro tenuissima, albida; hyphae inflatae, tenuitunicatae, fibulatae. Sporae 7–9 × 5.5–7.5 (8 × 6.5) μ, subglobosae, sub micr. hyaiinae vel pallido-incarnatae, interdum flavo-brunneae. Basidia 30–40 × 7.5–10 μ, claviformia, 4-sporigera. Cheilocystidia copiosa, 54–84.5 × 8–15 μ, tenuitunicata, cylindrico-fusiformia vel elongato-ventricosa, apice acuto; brunneolo-vacuolata. Pleurocystidia 48–52 × 10.5–13.5 μ, inflate fusiformia, saepe mucronata. Cellulae ultimae cuticulae pilei subcylindricae vel elongato-fusiformes, 50–245 × 7.5–17.5 μ, fibulatae. Ad terram, Varneys, St. Helena Is. 16 April 1965. Legit *A. Loveridge* (Typus).

Pileus 30 mm diam., convex becoming expanded, obtusely umbonate, dark umbrinous to black, innately radially fibrillose, with the white underlying flesh showing through towards the margin; slightly rugulose and veined towards the centre, and without scales; margin slightly serrate. *Lamellae* free, moderately crowded, broadly ventricose, sordid pink often with a distinctive dark brown edge though sometimes concolorous. *Stipe* 60 × 6 mm, equal or slightly thickened below, hollow, pale grey towards the apex but elsewhere covered by an extensive dark brown fibrillose layer which may become detached in places to form indefinite recurved scales. *Taste* and *smell* unknown. *Context* very thin in the pileus, whitish, consisting of thin-walled inflated hyphae with numerous clamp-connexions. *Spores* 7–9 × 5.5–7.5 (8 × 6.5) μ, subglobose, under the microscope hyaline or pale pink, though a few are tinged brown, thin-walled, containing numerous oil-guttules. *Spore print* unknown. *Basidia* 30–40 × 7.5– 10 μ, claviform with a basal clamp-connexion, 4-spored, sterigmata up to 5 μ long. *Cheilocystidia* present, abundant, 54–84.5 × 8–15 μ, a few hyaline but mostly with abundant brown, vacuolar sap, thin-walled, fusiform-cylindric to elongate

with a ventricose base, and pointed apex. *Pleurocystidia* numerous, 48–52 × 10.5–13.5 μ, many with a long pedicellate base; inflated fusiform, often with brownish contents, frequently mucronate with the mucro 7–12 μ long. *Pileus surface* consisting of a filamentous cutis of subcylindric or elongate fusiform cells, thin-walled, brown contents, clamp-connexions at the septa; terminal elements 50–245 × 7.5–17.5 μ.

On the ground (probably on buried wood), under pear tree, Varneys, St. Helena Island, South Atlantic. 16 April 1965. Legit *A. Loveridge* (Type).

The above description is based on a single sporophore which has been preserved in alcohol. However, as there are a number of distinctive and unique features present, it was decided that the species could be confidently described as new. Both the cheilocystidia and the pleurocystidia are of the thin-walled leptocystidioid type, and not metuloids, so that the species clearly belongs in the section *Hispidoderma* Fayod of the genus *Pluteus*. The hyphae, particularly those of the stipe, were readily observed, and the presence of abundant clamp-connexions restricts the species to the stirps *Nigrolineatus*. *Pluteus brunneisucus* may be separated macroscopically from the other species in this group by the abundant, dark, fibrillose covering to the stipe. *Pluteus nigrolineatus* Murr., recorded from Florida (U.S.A.) and Argentine, further differs by the blue base to the stipe, the concolorous gill-edge, and the more ellipsoid spores. *Pluteus umbrinidiscus* Murr., from North America, has a more brightly coloured pileus, a concolorous gill-edge, and much smaller cheilocystidia. According to the analysis given by Singer (1956), *P. avellaneus* would appear close to *P. brunneisucus*, but Stuntz & Smith (1958) state that the type material lacks clamp-connexions.

BOLBITIACEAE Sing.

CONOCYBE OCHRACEA (Kühn.) Sing.
var. **africana** Pegler, *var. nov.*—Text-figs. 21–25

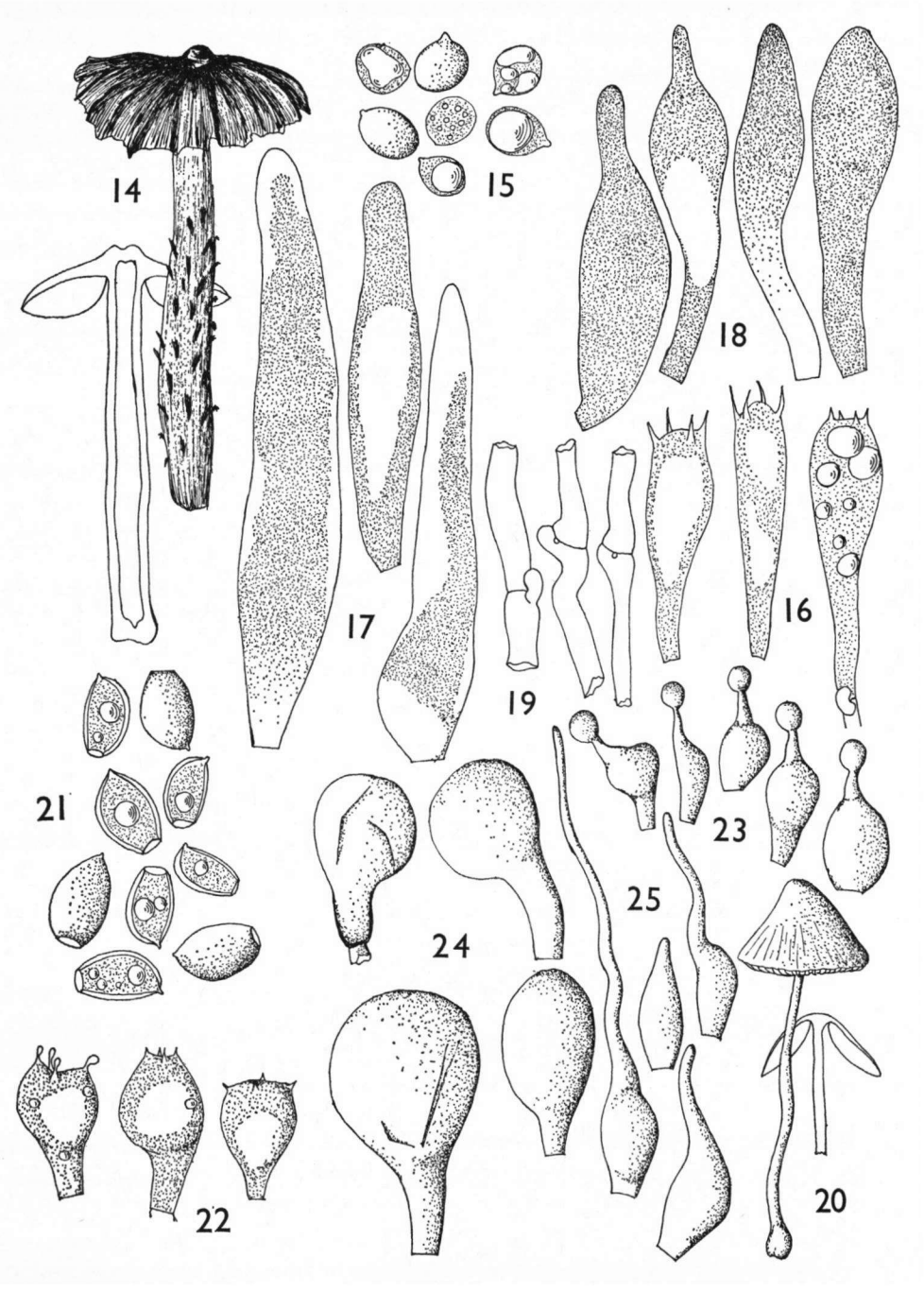
A var. *ochracea* differt stipite toto albido et magnitudine maiore. In pratum, Makerere University Campus, Uganda. Alt. 4,300 ft. 1 June 1964. legit *A. Ojong*. Comm. *E. A. Calder*, no. *105* (Typus).

Pileus 12–30 mm diam., conico-campanulate, 'Light Ochraceous Buff' becoming deeper ochraceous towards the apex, finely striate, with the striae a darker brown; margin straight, somewhat crenate. *Lamellae* ascendant adnate to adnexed, ochraccous buff to rust-brown, linear or subventricose, moderately crowded, and with lamellulae; edge entire, concolorous. *Stipe* 5–11 cm × 1–4 mm, equal, filiform, flexuous, usually with a bulbous base (up to 6 mm diam.), hollow, white over the entire length, pruinose towards the apex. *Context* very thin, pale to concolorous. *Spores* 9–12.5 ×

EXPLANATION OF FIGURES 14–25

Figs. 14–19. *Pluteus brunneisucus*. — 14. Habit of sporophore and section (× 1). — 15. Spores. — 16. Basidia. — 17. Cheilocystidia. — 18. Pleurocystidia. — 19. Clamp-connexions.

Figs. 20–25. *Conocybe ochracea* var. *africana*. — 20. Habit of sporophore and section (× 1). — 21. Spores. — 22. Basidia. — 23. Cheilocystidia. — 24. Epithelial sphaerocysts. — 25. Hairs on stipe. (All × 1000 unless otherwise stated.)



Figs 14—25

6–8 (11 ×7) μ, ovoid to ellipsoid, occasionally with a slight hexagonal outline in frontal view, rust-brown, thick-walled, smooth, with a broad truncate germ-pore and containing at least one, often several small oil-guttules. *Spore print* deep rust-brown. *Basidia* 16.5–22 × 10–12.5 μ, broad piriform pedicellate, constantly bearing 4 short sterigmata (up to 3.5 μ long). *Cheilocystidia* numerous, 16.5–23 × 4.5–9.5 μ, lecythiform, hyaline, with a small globose head, 3–4 μ diam., the base occasionally not becoming inflated. *Pleurocystidia* absent. *Hymenophoral trama* regular but reduced to a narrow mediostratum of filamentous hyphae, flanked by a well developed hymenopodium of broadly inflated hyphae. *Pileus surface* an epithelium of subglobose or piriform sphaerocysts, mostly monostratous, but sometimes a catenate arrangement is found; individual cells 11.5–24.5 μ diam., hyaline at the apex, but with the wall pigmented brown towards the basal septum; no pilocystidia observed. *Caulocystidia* present, confined to the upper region of the stipe, obovoid to fusiform, 5.5–9 μ diam., hyaline, many with a long flexuous neck, up to 60 μ long, 1–2.5 μ diam.; lecythiform cystidia not produced on the stipe. All hyphae are provided with clamp-connexions.

In open grass, on mown lawn. Makerere University Campus, Uganda. Alt. 4,100 ft. 1 June 1964. Legit *A. Ojong*. Comm. *E. A. Calder*, no. *105* (Type).

The presence of lecythiform cystidia on the gill-edge, coupled with the complete absence of these structures on the surface of the stipe, place this fungus in the section *Pilosellae* (Kühn.) Sing. of *Conocybe* Fayod. Microscopically the Uganda material agrees in every detail with the macrosporous form of the European species, *C. ochracea*, as originally described from France, by Kühner (1935). However, the white coloration of the stipe found in the Uganda collection would suggest that it is distinct from *C. ochracea* as understood in Europe. Typically *C. ochracea* has a stipe which may be white at the apex, but is distinctly brownish or ochraceous for the greater length, and indeed, this is so throughout the section *Pilosellae*. The section *Candidae* (Kühn.) Sing. was erected to accomodate the white-stemmed species but, because all the other structures conform so closely, it is decided to regard this fungus as a tropical variety of *C. ochracea*.

COPRINACEAE Roze

Coprinus africanus Pegler, *sp. nov.*—Text-figs. 26–30

Pileus 3–6 cm altus, 2.5–4.5 cm latus, e conico-convexo conico-expansus vel expansus late umbonatus, primo totus griseo-brunneolus, radialiter sulcato-striatus, velo paupero. Lamellae liberae, confertae, fusco-nigricantes; ad aciem sub lente pruinosae. Stipes 6–15 cm × 4–8 mm, aequalis, cylindricus, cavus, totus albus; annulo nullo. Caro tenuissima, concolorata. Sporae 5.3–7.6 × 4–5 × 3.7–4.8 (6.3 × 4.7 × 4.5) μ, ellipsoideo-amygdaliformes, atrofuscae, laeves, poro germinativo truncato. Basidia 14–18 × 5–7 μ, late claviformia vel subcylindrica, 4-sporigera. Pleurocystidia 60–90 × 20–28.5 μ, utriformia vel ventricoso-fusiformia, hyalina, tenuitunicata. Cheilocystidia pleurocystidiis similia. Trama hymenophoralis regularis. Cellulae cuticulae pilei late inflatae, hyalinae, 34-85 × 11.5–25 μ. Hyphae veli ad discum pilei hyalinae vel luteo-brunneae, 2.5–8.5 μ diam. Hypae fibulis praeditae.

Inter folias. Mpanga Forest, Makerere University College, Uganda. Alt. 4,300 ft. 27 April 1964. Legit *A. Ojong*. Comm. *E. A. Calder*, no. *76* (Typus).

Pileus 3–6 cm high, 2.5–4.5 cm wide, conico-convex then expanded and broadly umbonate, 'Drab-Gray' to 'Light Brownish Drab' at the disc, margin becoming

blackish as gills deliquesce; sulcate-striate almost to the disc. *Veil* absent except for a few indefinite, silky fibrils. *Lamellae* free, ascending, densely crowded with numerous lamellulae, pale at first, finally fuscous-black, deliquescent; edge white pruinose. *Stipe* 6–15 cm × 4–8 mm, equal, cylindric, hollow, pure white over the entire length, smooth, devoid of a ring or annular zone. *Context* thin, concolorous. *Spores* 5.3–7.6 × 4–5 × 3.7–4.8 (6.3 × 4.7 × 4.5) μ, ellipsoid-amygdaliform, fuscous black, discolouring in concentrated H_2SO_4, smooth, with a complex double wall, and a broad truncate germ-pore. *Spore print* dark 'Fuscous'. *Basidia* 14–18 × 5–7 μ, broadly claviform to subcylindric, sometimes narrowed in the middle, bearing 4 sterigmata (up to 4 μ long). *Cheilocystidia* present, prominently projecting from the immature gills, similar to the pleurocystidia. *Pleurocystidia* numerous, 60–90 × 20–28.5 μ, hyaline, utriform to ventricose-fusiform, thin-walled, readily observed with a hand lens. *Hymenophoral trama* regular, hyaline, narrow, consisting of broadly inflated thin-walled hyphae. *Pileus-surface* formed of irregular, radiating chains of elongated elements, which are hyaline, thin-walled, often broadly inflated, 34–85 × 11.5–25 μ. The remnants of the veil consist of elongate hyaline or pale brown hyphae, 2.5–8.5 μ diam., which are smooth, moderately thin-walled, with clamp-connexions at the septa. All hyphae provided with clamp-connexions.

Amongst fallen leaves, etc. Mpanga Forest, Makerere University College, Uganda. Alt. 4,300 ft. 27 April 1964. Legit *A. Ojong*. Comm. *E. A. Calder*, no. 76 (Type).

The macroscopic appearance, the structure of the pileus-surface, and the large voluminous cystidia indicate that this species is closely related to *C. atramentarius* (Bull. ex Fr.) Fr. and *C. insignis* Peck. It should therefore be placed in the section *Coprinus* Sing., subsection *Atramentarii* (Fr.) Konr. & Maubl. *Coprinus africanus* may be distinguished from *C. atramentarius* by the decidedly smaller and differently shaped spores, the lack of any velar scales on the pileus, and the absence of a basal, annular zone to the stipe. *Coprinus insignis* differs in having a silky fibrillose veil, and ornamented spores.

COPRINUS CHAIGNONI Pat.—Text-figs. 31, 32

Coprinus chaignoni Pat. *in* Bull. Soc. mycol. Fr. **19**: 246. 1903.

Pileus 6–10 mm high, 15–20 mm wide, thin, conico-ovate to campanulate, then expanded, deliquescent at the margin. Surface sulcate striate and at first covered by an ochraceous, furfuraceous veil, forming small imbricate squamules which are persistent at the apex. *Lamellae* black, narrow. *Stipe* up to 2 cm long, white, slender, with the base sheathed in an ochraceous, cupulate volva. *Spores* 6.6–10 × 4–5.3 (8 × 4.7) μ, ellipsoid to cylindric-phaseoliform, fuscous-black, smooth, translucent, with a broad germ-pore. *Cystidia* not observed. *Pileus-surface* cellular-hymeniform, consisting of subglobose, smooth, hyaline elements, 25–52 μ diam. *Velar elements* mostly globose or piriform, 22–60 μ diam., minutely verrucose; also present are a few cylindric or irregularly fusiform elements, c. 48–60 × 8–19 μ, hyaline or with a slight yellowish tint.

On sandy ground, Bir m'Chegga, Tunisia. Legit *Cl. de Chaignon* (FH, type).

The fragmentary state of the type material has prevented any addition being made to the macro-characters provided by Patouillard. The presence of a granular veil on the pileus, together with a tomentose volva, would certainly place this species

within the section *Picacei* Fr. of the genus *Coprinus*. The presence of punctate sphaerocysts in the veil suggests that *C. chaignoni* approaches most closely to *C. cineratus* Quél., of the European species.

COPRINUS DISSEMINATUS (Pers. ex Fr.) S. F. Gray—Text-figs. 33, 34

Coprinus disseminatus (Pers. ex Fr.) S. F. Gray, Nat. Arrangement Brit. Pl. 1: 634. 1821.

This common temperate species would also appear to have a wide pantropical distribution. African collections have been received from Mpanga Forest, Uganda. Alt. 4,300 ft. 11 May 1964. Legit *E. A. Calder*, no. *102*; and also from Muguga district, Kenya. August 1964. Legit *F. M. Munga*, no. *F. 19*. It may be readily recognised by the gregarious habit; the large, setuliform pilocystidia; and brown, ellipsoid spores which measure 7–8.5 × 4–4.8 (7.8 × 4.5) μ.

COPRINUS DRYOPHILUS Pat.—Text-figs. 35, 36

Coprinus dryophilus Pat. *in* Bull. Soc. mycol. Fr. **18**: 49. 1902.

Pileus 4–7 cm wide, convex campanulate, tough, fleshy, citrine yellow flushed with reddish-brown particularly at the disc, and covered by distant, reddish-brown scales of the veil; margin striate. *Lamellae* black, straight, with serrated edge, soon deliquescent. *Stipe* cylindric, attenuated towards the rooting base; concolorous with the pileus, striate, hollow, bearing a few indistinct scales. *Spores* 8.7–12 × 7–8.3 × 6–8 (10.5 × 7.5 × 7.2) μ, amygdaliform, mitriform in face-view, dark brown, smooth, with a distinct, frequently truncate, germ-pore. *Cystidia* not observed. *Pileus-surface* composed of hyaline or yellowish tinted, filamentous chains of elongate elements, with short side branches. Individual elements measure 20–95 × 5–20.5 μ, are smooth and provided with clamp-connexions at the septa while the terminal elements are usually cylindric. *Velar* scales not observed.

On *Quercus* trunk, El Fedja, Tunisia. April (FH, type).

The poor condition of the type material has prevented any further study on the macro-characters of this large fleshy species. However, the filamentous nature of the pileus-surface indicates that *C. dryophilus* would be best placed within the section *Coprinus*, subsection *Alachuani* Sing.

COPRINUS PLICATILIS (Curt. ex Fr.) Fr.—Text-fig. 37

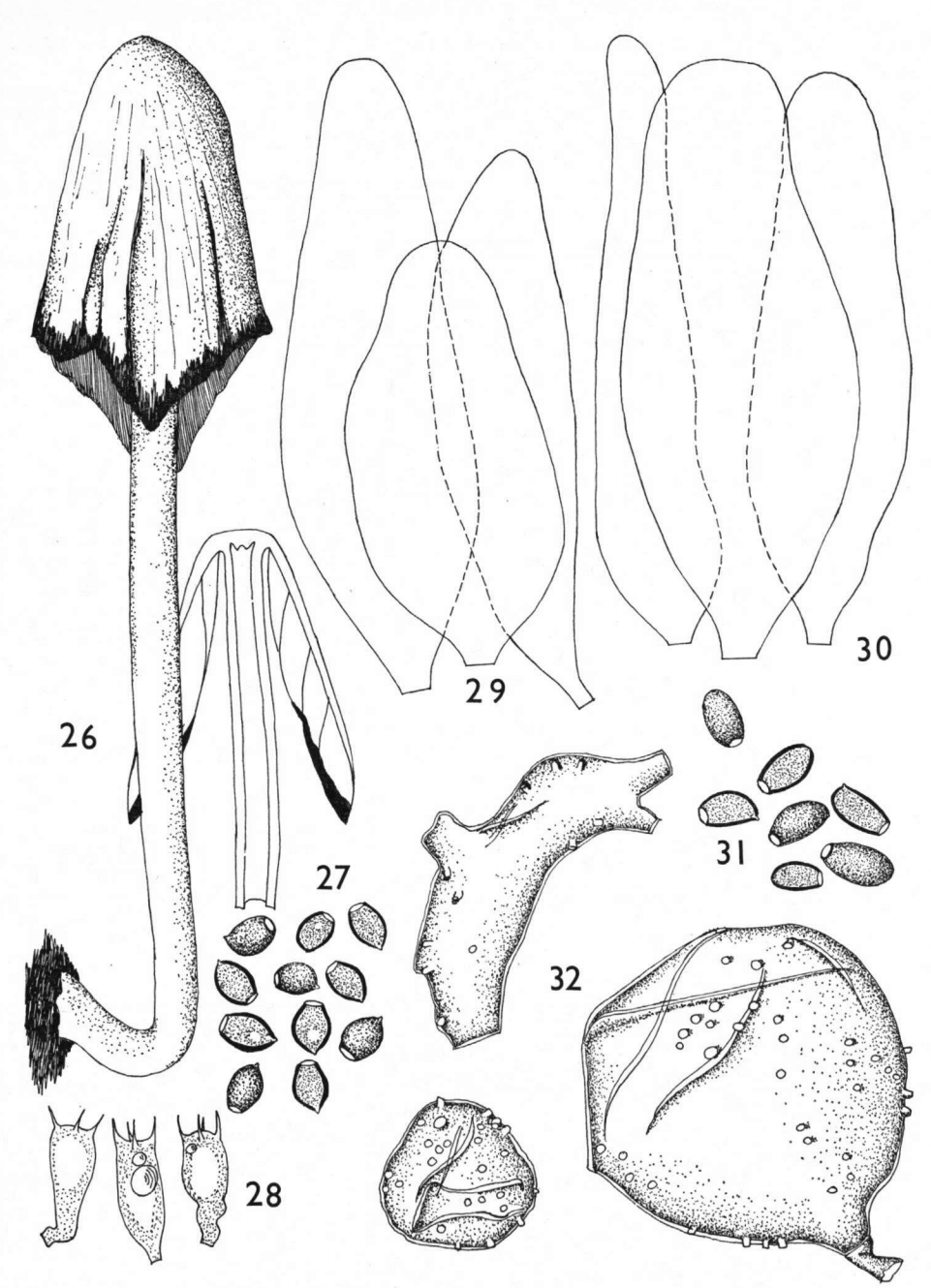
Coprinus plicatilis (Curt. ex Fr.) Fr., Epicrisis 252. 1838.

This common species is usually to be found growing amongst grass, or on garden soil. It has been frequently collected in both East and West Africa, and the following collections have been received: Njala, Sierra Leona. 20 Dec. 1933. Legit *F. C.*

EXPLANATION OF FIGURES 26–32

Figs. 26–30. *Coprinus africanus*. — 26. Habit of sporophore and section (× 1). — 27. Spores. — 28. Basidia. — 29. Cheilocystidia. — 30. Pleurocystidia.

Figs. 31, 32. *Coprinus chaignoni*. — 31. Spores. — 32. Elements of veil. (All × 1000 unless otherwise stated.)



Figs. 26—32

Deighton, no. *M. 59*; Njala, Sierra Leone. 17 April 1934. Legit *F. C. Deighton*, no. *M. 653*; Cacao Research Institute, Tafo, Ghana. 1955. Legit *Miss M. Holden*; Kikuju Province, Kenya. July 1963. Legit *F. Munga*, no. *F.9*; Makerere University campus. Alt. 4, 100 ft. 1 June 1964. Legit *A. Ojong*. Comm. *E. A. Calder*, no. *106*. This non-deliquescent species may be recognised by the strongly expanded, plicate pileus with a tawny, central disc; and oval-rhomboidal spores, ellipsoid in profile, which measure 11.5–16.5 × 11.5–13.5 × 8.5–11 (15 × 12.3 × 10) μ.

COPRINUS SEMIANUS Pat.—Text-fig. 38

Coprinus semianus Pat. *in* Bull. Soc. mycol. Fr. **20**: 53. 1904.

Pileus up to 20 mm high, 25 mm wide, fleshy, ovoid to cylindric with an obtuse rounded apex; white or whitish, covered towards the disc by thick, ochraceous-yellow, velar scales. *Lamellae* white at first, deliquescent, broad, unequal. *Stipe* 7–12 cm long, up to 10 mm diam., whitish, bearing a few small scales particularly in the lower region, cylindric though expanding towards the base to form a radicant, non-marginate bulb, up to 2 cm diam.; hollow except for the base which is hard, woody in texture. *Spores* 8–14.5 × 6.5–9.3 (10.7 × 7.6) μ, ellipsoid, fuscous, with complex double wall, and a small germ-pore. *Cystidia* not observed. *Pileus-surface* and velar structure not discernible.

On the ground, M'zi wadi, Laghouat, Algeria. Oct. 1903. Legit *Cpt. Sem* (FH,type).

The type material is in a very fragmentary state and it has not been possible to examine any of the pileal structures. Accompanying the collection are some field-notes made by the collector, concerning the appearance and size of the fungus, and these have been incorporated into the above description to supplement Patouillard's original diagnosis. The type sheet also bears the following comment by Patouillard: "Très différent de *C. comatus* par l'absence d'anneau, la forme et texture du pied et par les spores plus rondes et plus longues." The species is probably best placed in the section *Coprinus* of the genus *Coprinus*.

Psathyrella atroumbonata Pegler, *sp. nov.*—Text-figs. 44–48

Pileus 15–50 mm latus, e conico-campanulato expansus, obtuse umbonatus, pallide ochraceo-bubalinus vel vinoso-cinnamomeus, ad discum atrobrunneus, ad marginem striatulus; e velo albo appendiculato demum glabrescens. Lamellae sinuato-adnatae, e pallido griseo-brunneae; ad aciem sub lente albo-flocculosae. Stipes 5–9 cm × 3–5 mm, aequalis, cylindricus, cavus, albidus. Caro tenuissima, albida. Sporae 5.5–8.5 × 3.7–5.2 (6.7 × 4.5) μ, ellipsoideae vel pruniformes, sub micr. pallide fuscae, pellucidae, cum poro germinativo. Basidia 12.5–16 × 5.5–7 μ, claviformia; 4-sporigera. Cheilocystidia copiosa, 13.5–34 × 8.5–11.5 μ, piriformia, utriformia vel lageniformia, hyalina, tenuitunicata. Pleurocystidia nulla. Trama hymenophoralis regularis, angusta, hyalina. Cuticula pilei cellularis.

Ad terram, inter folias. Mpanga, Makerere University College, Uganda. Alt. 4,300 ft. 24 April 1964. Legit *E. A. Calder*, no. *74* (Typus).

Pileus 15–50 mm diam., conico-campanulate becoming expanded, obtusely umbonate, 'Light Ochraceous Buff' to 'Light Vinaceous Cinnamon', darkening at the umbo to 'Bister', faintly striate at the margin. There is an abundant white fibrillose veil present forming appendiculate scales at the margin which disappear

on maturity. The *veil* consists of loosely interwoven hyphae, 2–5 μ diam., hyaline thin-walled, septate with clamp-connexions. *Lamellae* sinuate-adnate, pale grey then 'Fuscous', moderately crowded, edge white flocculose. *Stipe* 5–9 cm × 3–5 mm, cylindric, equal, hollow, white, smooth without any trace of a veil, except in very young specimens. *Context* very thin, white. *Spores* 5.5–8.5 × 3.7–5.2 (6.7 × 4.5) μ, ellipsoid to pruniform, under the microscope pale fuscous, translucent, germ-pore small and at times indistinct. *Spore print* 'Fuscous'. *Basidia* claviform, 12.5–16 × 5.5–7 μ, with 4 short sterigmata. *Cheilocystidia* abundant, 13.5–34 × 8.5–11.5 μ, hyaline, thin-walled, forming a sterile gill-edge, varying in shape from piriform or utriform to lageniform. *Pleurocystidia* absent. *Hymenophoral trama* regular, hyaline in NH_4 OH, even in young specimens, consisting of thin-walled, inflated hyphae (up to 7 μ diam.). The trama proper is restricted to a very narrow region, rarely exceeding 12 μ in width, by a well developed subcellular hymenopodium. *Pileus-surface* a monostratous epithelium, consisting of vesiculose, piriform or ellipsoid cells. Cells hyaline, thin-walled, 14.5–30 μ diam., devoid of any brown pigmentation. All hyphae provided with clamp-connexions.

Amongst litter, including *Acalypha* L., and *Oplismenus* Beauv. Mpanga, Makerere University College, Uganda. Alt. 4,300 ft. 27 April 1964. Legit *E. A. Calder*, no. *74* (Type).

The appendiculate veil, lack of pleurocystidia, a hyaline hymenophoral trama, and small spores would all suggest that this species of *Psathyrella* is closely related to *P. candolliana* (Fr.) Maire, and should be placed within the subgenus *Hypholoma* (Fr.) Sing. However it may be readily distinguished by a number of characters, particularly in the lack of a purplish-lilac tinge to the gills, the dark brown umbonate pileus, and in the smaller and differently shaped cheilocystidia. *Psathyrella spintrigera* (Fr.) Konr. & Maubl. differs in having a brown pigmented hymenophoral trama, and an abundant and persistent veil which forms scales on the pileus and an annulate zone on the stipe. *Psathyrella microlepidota* P. D. Orton similarly has an abundant veil on the pileus and the stipe, and also larger cheilocystidia and smaller spores.

PSATHYRELLA CANDOLLIANA (Fr.) Maire

See *Psilocybe albobrunnea*, p. 102.

Psathyrella glandispora Pegler, *sp. nov.*—Text-figs. 39–43

Pileus 20–50 mm latus; e conico-convexo expansus, interdum obtuse umbonatus, avellaneus vel ravo-cinnamomeus, ad discum obscurius brunneus, laevis, striatulus; ad marginem demum reflexus. Lamellae liberae vel adnexae, pallide griseo-brunneae, confertae, ad aciem sub lente minutissime albo-flocculosae. Stipes 3–7 cm × 2–4 mm, aequalis, cylindricus, cavus, pileo concolor, ad apicem leviter albo-pruinosus. Caro tenuis, concolorata. Sporae 7.5–9.2 × 4–5.5 (8.2 × 4.6) μ, ellipsoideae vel *Quercus* glandi similes, sub micr. rufo-brunneae, pellucidae, cum poro germinativo. Basidia 13.5–18 × 7.5–9 μ, claviformia, 4-sporigera. Cheilocystidia copiosa, 21–35 × 7–10.5 μ, urniformia vel obtuse lageniformia, hyalina, tenuitunicata. Pleurocystidia nulla. Trama hymenophoralis regularis, angusta, pallide brunnea. Cuticula pilei cellularis.

Ad mortuos ramulos. Mpanga, Makerere University College, Uganda. Alt. 4,300 ft. 16 April 1964. Legit *A. Ojong*. Comm. *E. A. Calder*. no. *51* (Typus).

Pileus 20–50 mm diam., conico-convex then expanded to almost plane or with a low, obtuse umbo, 'Avellaneous' to 'Cinnamon-Drab', darkening at the centre to

'Verona Brown'; margin slightly reflexed at maturity. *Lamellae* adnexed to free, light brown, linear, crowded, with numerous lamellulae; edge white, minutely denticulate. *Stipe* 3–7 cm × 2–4 mm, cylindric, equal, hollow, concolorous with the pileus or paler, apex white pruinose, remainder smooth, fibrillose. *Context* of cap, thin, concolorous, consisting of broadly inflated, thin-walled hyphae. *Spores* 7.5–9.2 × 4–5.5 (8.2 × 4.6) μ, smooth, ellipsoid, pointed at the apiculate end. under the microscope reddish-brown, translucent, with few contents except for occasional small oil guttules, a fairly thin wall, and a broad, truncate germ-pore. *Spore print* cinnamon fuscous. *Basidia* short claviform, 13.5–18 × 7.5–9 μ, bearing 4 sterigmata, 2–3.5 μ long. *Cheilocystidia* abundant, forming a sterile gill-edge, leptocystidioid, 21–35 × 7–10.5 μ, urniform to obtusely lageniform, with a broad neck and rounded apex, occasionally claviform, hyaline, thin-walled. *Pleurocystidia* absent. *Hymenophoral trama* regular, brown pigmented in NH_4 OH, consisting of broadly inflated thin-walled hyphae (up to 14.5 μ wide). The trama proper is restricted to a narrow region, never more than 4.5 μ wide, by a well developed, hyaline, subcellular hymenopodium, suggesting a false bilaterality. *Pileus-surface* a monostratous epithelium of vesiculose and piriform cells, not forming a true palisade. Cells hyaline or with a pale brown membrane pigment, 8–25 μ wide; beneath these is a thin hypodermium of filamentous, orange-brown hyphae.

On dead twigs, amongst *Zingiber* and *Piper*. Mpanga, Makerere University College, Uganda. Alt. 4,300 ft. 16 April 1964. Legit *A. Ojong*. Comm. *E. A. Calder*, no. *51* (Type).

There is no evidence, either from examination of the dried material or from the collector's field notes, to suggest that *P. glandispora* bears a veil. The presence of thin-walled, utriform cystidia covering the gill-edge, places the species in the subgenus *Hypholoma* (Fr.) Sing. However the combination of a brown-pigmented, hymenophoral trama, and spores that measure more than 6.5 μ in length, makes it difficult to suggest any further affinitiy. The section *Spintrigerae* (Fr.) Sing. is characterised by the combination of these characters, but the only known species, namely *P. spintrigera* (Fr.) Konr. & Maubl., has an abundant veil, and a ring which persists on the stipe. Other species with a pigmented trama fall into either the section *Hydrophilae* (Romagn.) Sing., which has very small spores, or the section *Frustulentae* (Romagn.) Sing., which has numerous pleurocystidia.

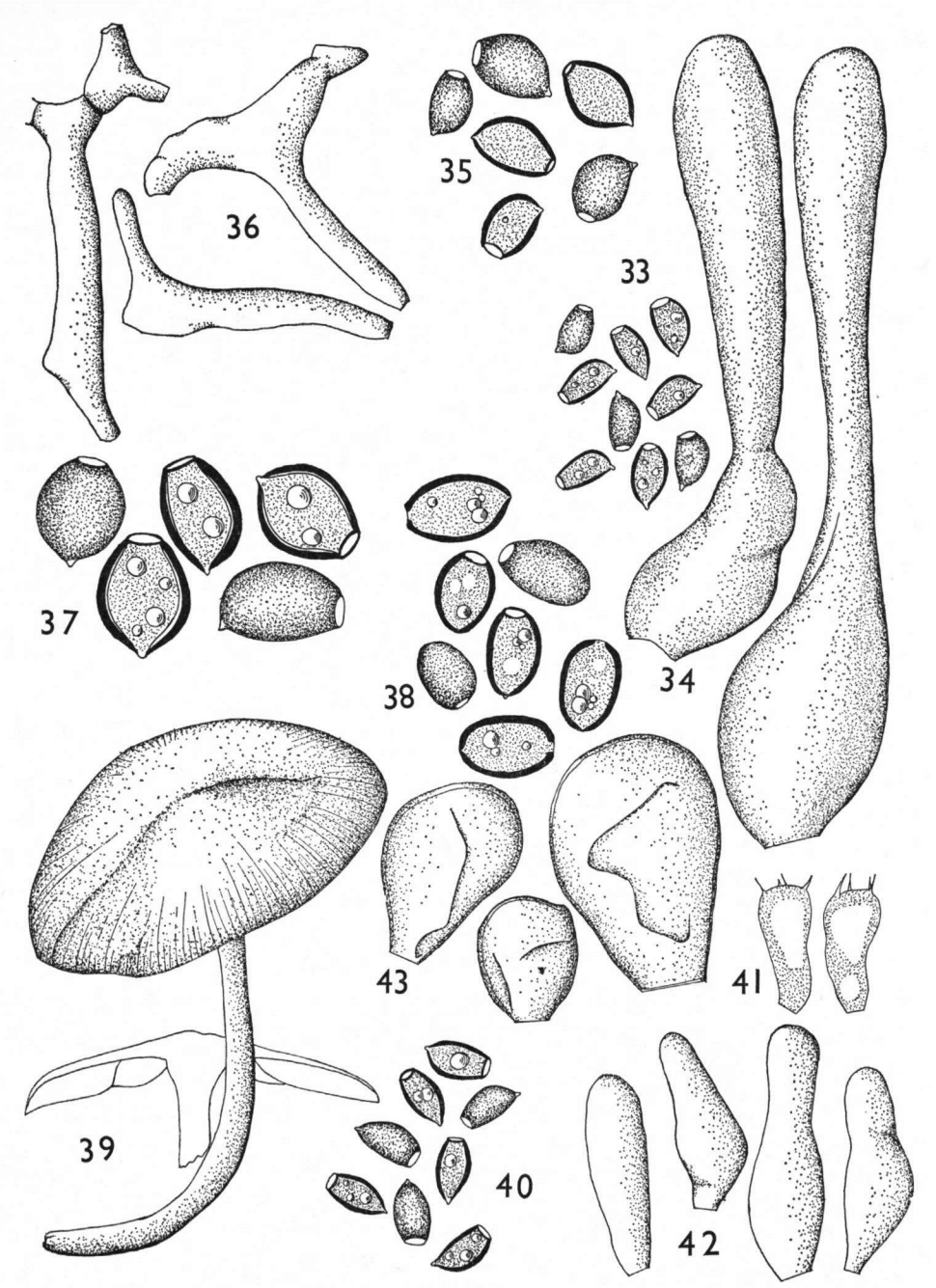
CORTINARIACEAE Roze

Galerina makereriensis Pegler, *sp.* nov.—Text-figs. 49–52

Pileus 10–75 mm latus, e conico-campanulato expansus, ad discum fulvo-ochraceus, ad marginem pallidius ochraceotinctus; laevis, hygrophanus. Lamellae adnato-adnexae interdum

EXPLANATION OF FIGURES 33–43

Figs. 33, 34. *Coprinus disseminatus*. — 33. Spores. — 34. Pilocystidia.
Figs. 35, 36. *Coprinus dryophilus*. — 35. Spores. — 36. Cuticular elements.
Fig. 37. *Coprinus plicatilis*. Spores.
Fig. 38. *Coprinus semianus*. Spores.
Figs. 39–43. *Psathyrella glandispora*. — 39. Habit of sporophore and section (× 1). — 40. Spores. — 41. Basidia. — 42. Cheilocystidia. — 43. Epithelial sphaerocysts. (All × 1000 unless otherwise stated.)



Figs. 33—43

dente decurrente, pallide ochraceo-bubalinae vel cinnamomeae, subconfertae, ad aciem concoloratae. Stipes 2–11 cm × 2–6 mm, ad basim incrassatus; cavus, supra albidus infra pallide ochraceus; striatus; annulus brunneus manifestus. Caro tenuis, pallide brunnea. Sporae 6.3–9 × 3.5–5 (7.3 × 4.2) μ, amygdaliformes, sub lente fulvobrunneae, minute punctatae, perisporio calyptrato. Basidia 14.5–19 × 4–6 μ, claviformia vel subcylindrica; 2- vel 4-sporigera. Cheilocystidia 31–40 × 7.5–10 μ, hyalina, tenuitunicata, lageniformia. Pleurocystidia copiosa, 30–37 × 9–12.5 μ, hyalina, lageniformia vel inflato-fusiformia. Trama hymenophoralis stricte regularis, subcellularis. Hyphae cuticulae pilei, 2.5–7 μ latae, leviter incrustato-pigmentatae. Hyphae fibulis multis praeditae.

Inter muscos, ad lignum mortuum. Mpanga, Makerere University College, Uganda. Alt. 4,300 ft. 11 May 1964. Legit *E. A. Calder*, no. *103* (Holotypus): Mpanga 69, Makerere University College, Uganda. 9 April 1964. Legit *A. Ojong*. Comm. *E. A. Calder*, no. 27 (Paratypus).

Pileus 10–75 mm diam., at first conico-campanulate, becoming plano-convex, with a reflexed margin at maturity. The colour is pale ochraceous brown, 'Ochraceous-Tawny' at the apex, drying yellowish, while the surface is smooth and hygrophanous. *Lamellae* adnato-adnexed, sometimes with a slight decurrent tooth, 'Light Ochraceous-Buff' to 'Cinnamon', edge concolorous; moderately crowded. *Stipe* 2–11 cm × 2–6 mm, expanding gradually to 9 mm diam. at the base, hollow, white above, pale ochraceous below, longitudinally striate; with a persistent, rust-brown annulus, c. 1 cm from the apex. *Context* thin, never exceeding 4 mm in thickness, light brown. *Spores* 6.3–9 × 3.5–5 (7.3 × 4.2) μ, amygdaliform, rusty-brown, usually containing a prominent central oil-guttule, calyptrate, partially covered by the hood-like remains of the perispore. The wall is finely punctate though with a smooth suprahilar plage, and there is no obvious germ-pore. *Spore print* fulvo-ferruginous. *Basidia* claviform to subcylindric, 14.5–19 × 4–6 μ, bearing either 2 or 4 sterigmata. *Cheilocystidia* present, 31–40 × 7.5–10 μ, hyaline, thin-walled, smooth, subcylindric to lageniform, intermixed with basidia. *Pleurocystidia* present, numerous, 30–37 × 9–12.5 μ, hyaline, thin-walled, lageniform or inflated-fusiform. *Hymenophoral trama* strictly regular, of the subcellular-type, hyaline, not exceeding 100 μ in thickness, consisting of broadly inflated, thin-walled elements, 24–60 × 10–25 μ. *Subhymenial layer* very thin, 10–20 μ thick, formed by narrow, filamentous, interwoven hyphae. *Pileus surface* consists of a cutis, 14–23 μ thick, of interwoven, repent, hyaline hyphae, 2.5–7 μ diam., with slight interhyphal pigment incrustations. *Caulocystidia* absent. Hyphae provided with conspicuous clamp-connexions at the septa.

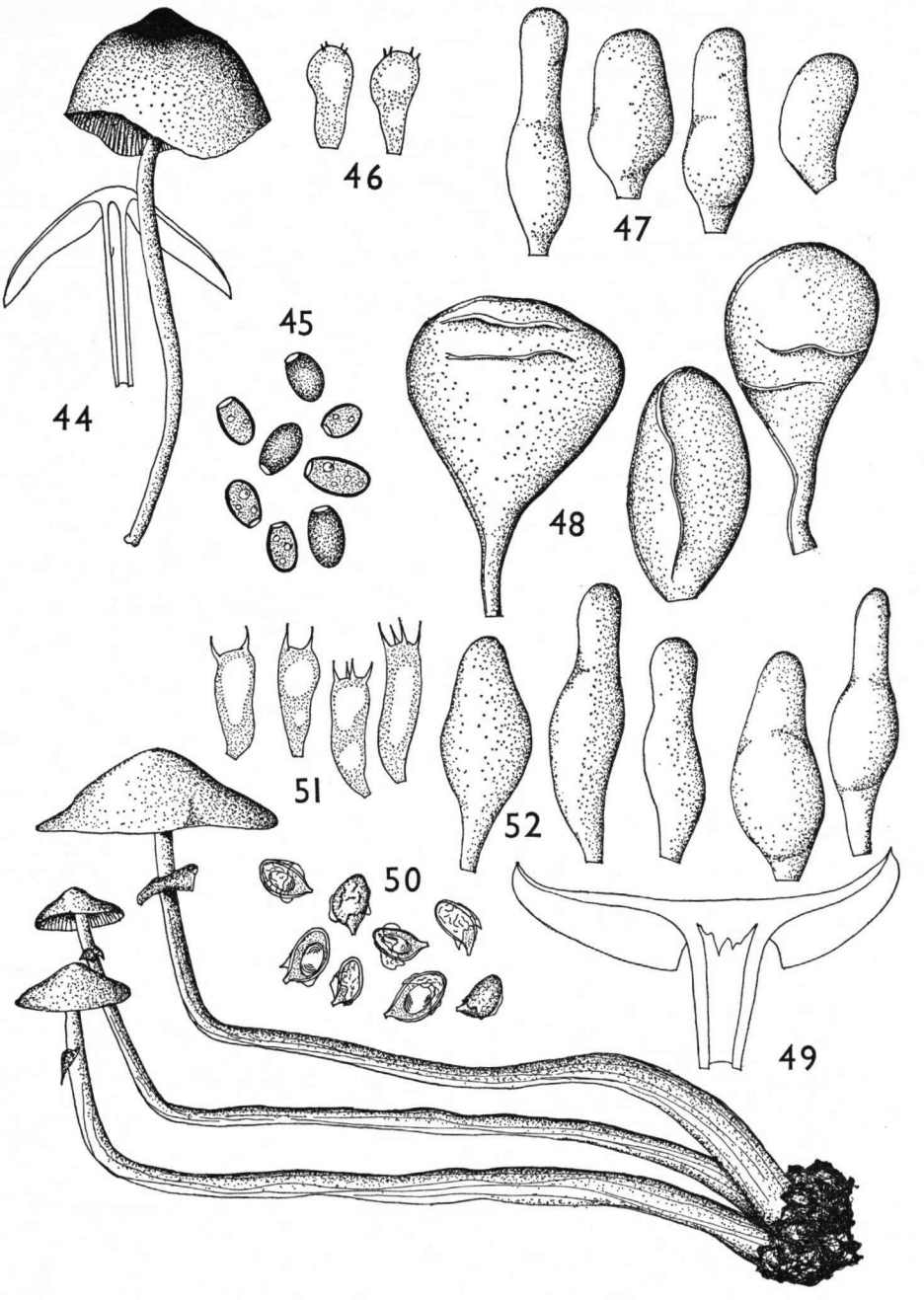
Amongst moss, on dead wood. Mpanga, Makerere University College, Uganda. Alt. 4,300 ft. 11 May 1964. Legit *E. A. Calder*. no. *103* (Holotype); Mpanga 69, Makerere University College, Uganda. 9 April 1964. Legit *A. Ojong*. Comm. *E. A. Calder*, no. *27* (Paratype).

The loose exosporium producing a highly characteristic appearance to the spores suggests that this species is best placed within the section *Calyptrospora* Smith &

EXPLANATION OF FIGURES 44–52

Figs. 44–48. *Psathyrella atroumbonata*. — 44. Habit of sporophore and section (× 1). — 45. Spores. — 46. Basidia. — 47. Cheilocystidia. — 48. Epithelial sphaerocysts.

Figs. 49–52. *Galerina makereriensis*. — 49. Habit of sporophore and section (× 1). — 51. Basidia. — 52. Pleurocystidia. (All × 1000 unless otherwise stated.)



Figs. 44—52

Singer of the genus *Galerina* Earle. According to Smith & Singer (1964) only two other species are known to possess both pleurocystidia and calyptrate spores, namely *G. filiformis* Smith & Sing. from Tropical America, and *G. macquariensis* Smith & Sing. from Southern Australasia.

The minute habit of *G. filiformis*, particularly the short, exannulate stipe, together with the larger spores, and the shape of the rare pleurocystidia, all contrast sharply with *G. makereriensis*. *Galerina macquariensis* which Singer & Smith have placed within their section *Physocystis* because of the presence of pleurocystidia, possesses an annulate stipe, and would appear much more closely related. It differs in having broader spores; a shorter, pale stipe which tapers towards the base; and in the habitat.

Gymnopilus njalensis (Beeli) Pegler, *comb. nov.*—Text-figs. 53–55

Pholiota njalensis Beeli *in* Bull. Jard. bot. État Brux. **15**: 40, pl. 3, fig. 27. 1938.

The type collection consists of a single fragmented sporophore which was at first preserved in alcohol but has subsequently been dried. Although the material is poor, the following micro-characters are discernable: *Spores* 7.2–9 × 4.8–6 (7.8 × 5.5) μ, rusty-melleous, ellipsoid, with a complex wall; surface strongly verrucose, with pyramidal verrucae (0.5–0.75 μ long). *Basidia* 22–25 × 5–7.5 μ, claviform though frequently constricted, bearing 2 or 4 sterigmata (up to 6.5 μ long). *Cheilocystidia* abundant, 16.5–23 × 4–5.5 μ, with a subcapitate apex, subventricose below, hyaline, thin-walled; many apically encrusted. *Pleurocystidia* absent. *Hymenophoral trama* regular, hyaline.

On garden-soil, Njala, Sierra Leone. 21 June 1935. Legit *F. C. Deighton*, no. *M727* (Type).

The species is clearly a member of the Cortinariaceae, and although it is stated to be terrestrial, the habit of the sporophore, the squamulose pileus, the annulate stipe, and the cheilocystidia are all more characteristic of *Gymnopilus* P. Karst. than *Cortinarius* Fr.

CREPIDOTACEAE (Imai) Sing.

CREPIDOTUS SPATHULATUS Bres.—Text-figs. 56, 57

Crepidotus spathulatus Bres. *in* Annuar. R. Ist. Bot. Roma **5**: 176, pl. 8, fig. 4. 1893.

Pileus 5–10 × 7–19 mm, spathulate cuneiform, thin, golden honey-coloured, radially striate, glabrous though with a white tomentose base. *Lamellae* decurrent, white becoming cinnamon, arcuate, crowded; edge entire, concolorous. *Stipe* absent. *Context* thin, concolorous, and when examined under the microscope is seen to consist of two distinct layers. The upper layer, 80–140 μ thick, is strongly gelatinized with loosely arranged, narrow hyphae, 1.5–3 μ diam., embedded in a hyaline matrix. The lower layer of the context is sharply differentiated from the gelatinous region, and is formed by compactly arranged, horizontal hyphae, 1.5–5 μ diam., lacking clamp-connexions at the septa. *Spores* 6.8–9.3 × 4.8–6 (7.5 × 5.3) μ, broadly ellipsoid, stramineous, thin-walled, smooth, devoid of a germ-pore. *Basidia* 16.5–23.5 × 6–7 μ, broadly claviform, bearing 4 sterigmata. *Cheilocystidia* not observed. *Pleurocystidia* absent. *Hymenophoral trama* regular, hyaline, consisting of subparallel hyphae similar to those of the context. Towards the gill-edge the trama forms a

decidedly gelatinized region in which the hyphae are very loosely arranged. *Pileus-surface* not differentiated, basically a cutis of repent hyphae, somewhat gelatinized, and bearing some membrane pigment incrustation. All hyphae devoid of clamp-connexions.

On decaying wood. Fekerie-Ghemb Forest, Shoa Mountains, Ethiopia. 19 March 1885. Legit *V. Ragazzi*, no. *12* pr. p. (S, type).

Pilát (1950) suggests in his key that *C. spathulatus* possesses a non-gelatinized context, but examination of the type collection has revealed considerable gelatinization both in the upper region of the pileus and also towards the edge of the gills. This may be readily demonstrated by mounting tangential sections in either cresyl blue in which the stain is taken up by the walls of the hyphae, or Indian-ink in which the ink fails to enter the gelatinized areas.

The structure of the spores and the context, together with the absence of clamp-connexions, indicate this species belongs in the section *Crepidotus* subsection *Defibulatini* Sing. However, Singer (1951) has suggested that this species may be more closely related to *Pleurotellus chioneus* (Pers. ex Fr.) Fayod ex Konr. & Maubl., because of the very pale coloration of the spores.

HYGROPHORACEAE Roze

HYGROPHORUS BIPINDENSIS P. Henn.—Text-figs. 58, 59

Hygrophorus (*Hygrocybe*) *bipindensis* P. Henn. *in* Bot. Jb. **30**: 49. 1899.

Pileus 25–40 mm wide, convex to campanulate, then expanded, becoming depressed in the centre, 'Cinnamon-Rufous' to 'Ochraceous Tawny', glabrous, striate at the margin. *Lamellae* arcuate decurrent, pale yellowish, subdistant; thickened at the edge. *Stipe* 3–7 cm × 2.5–4 mm, equal, cylindric or slightly expanded towards the apex, stuffed, smooth, concolorous with the pileus or paler. *Spores* 4.8–8 × 3.5–4.2 (6.8 × 4) μ, ovoid to elongate ellipsoid, at times constricted, hyaline, with a large oblique apiculus, and containing highly refractive oil guttules. *Basidia* 30–40 × 4–5 μ, cylindric, bearing 4 sterigmata (up to 5 μ long). *Hymenophoral trama* subregular, consisting of inflated, hyaline hyphae; no suggestion of any bilateral structure. *Pileus-surface* a cutis of repent, hyaline hyphae 3–8.5 μ diam., somewhat interwoven but not gelatinized.

On the ground. Bipindi, Cameroun. April 1899. Legit *G. Zenker*, no. *2027* (S, type).

An examination of the type collection has provided some additional information on the micro-characters, and this together with a water-colour sketch by Zenker, which accompanies the material, provides a more complete description than that originally published by Hennings. The structure of the hymenophoral trama clearly indicates that the species has been correctly placed within the subgenus *Hygrocybe* (Fr.) Fr. of the genus *Hygrophorus*.

POLYPORACEAE Fr.

LENTINUS BAGUIRMIENSIS Pat. & Har.

Lentinus baguirmiensis Pat. & Har. *in* Bull. Soc. mycol. Fr. **24**: 14. 1908.

Pileus 5–7 cm diam., plane becoming depressed at the centre, thin, ochraceous drying cinnamon-brown, with a few, small, erect squamules at the centre, becoming glabrous towards the margin; margin entire, smooth, incurved. *Lamellae* decurrent, concolorous with the pileus surface, narrow arcuate, not exceeding 1 mm in width, very crowded, anastomosing towards the stipe; edge entire. *Stipe* 5–7 cm long, up to 15 mm diam., central, solid; equal or slightly expanded towards the elongate, rooting base; surface concolorous with the pileus, bearing a few appressed, darker squamules. *Context* pale, fleshy, inamyloid, consisting of loosely interwoven, hyaline, thin-walled hyphae, 2–5 μ diam., highly branched with abundant clamp-connexions. *Spores* not observed. *Basidia* 25–32 × 4.5–6 μ, hyaline, narrow, claviform to subcylindric, arising from a basal clamp-connexion. *Cheilocystidia* and *pleurocystidia* absent. *Hymenophoral trama* irregular, hyaline, devoid of any bilateral structure, consisting of highly branched, thin-walled hyphae, 2–5 μ diam. Subhymenial layer well developed, 25–30 μ wide. *Pileus-surface* essentially a cutis of interwoven, subhyaline hyphae, 2.5–4.5 μ diam., thin-walled, with numerous clamp-connexions. This forms a pigmented layer 150–200 μ thick.

On sandy ground. Baguirmi, Chad. Sept. 1903. Legit *A. Chevalier*, no. *11495* (PC, type).

The above data are based upon the original description by Patouillard and Hariot, and on examination of the type collection. It has not been possible to recover any spores from this material but, nevertheless, the observed characters strongly suggest that *L. baguirmiensis* is a further synonym for *Pleurotus tuber-regium* (Fr). Sing., even though no mention has been made of the attachment of a sclerotium to the rooting base.

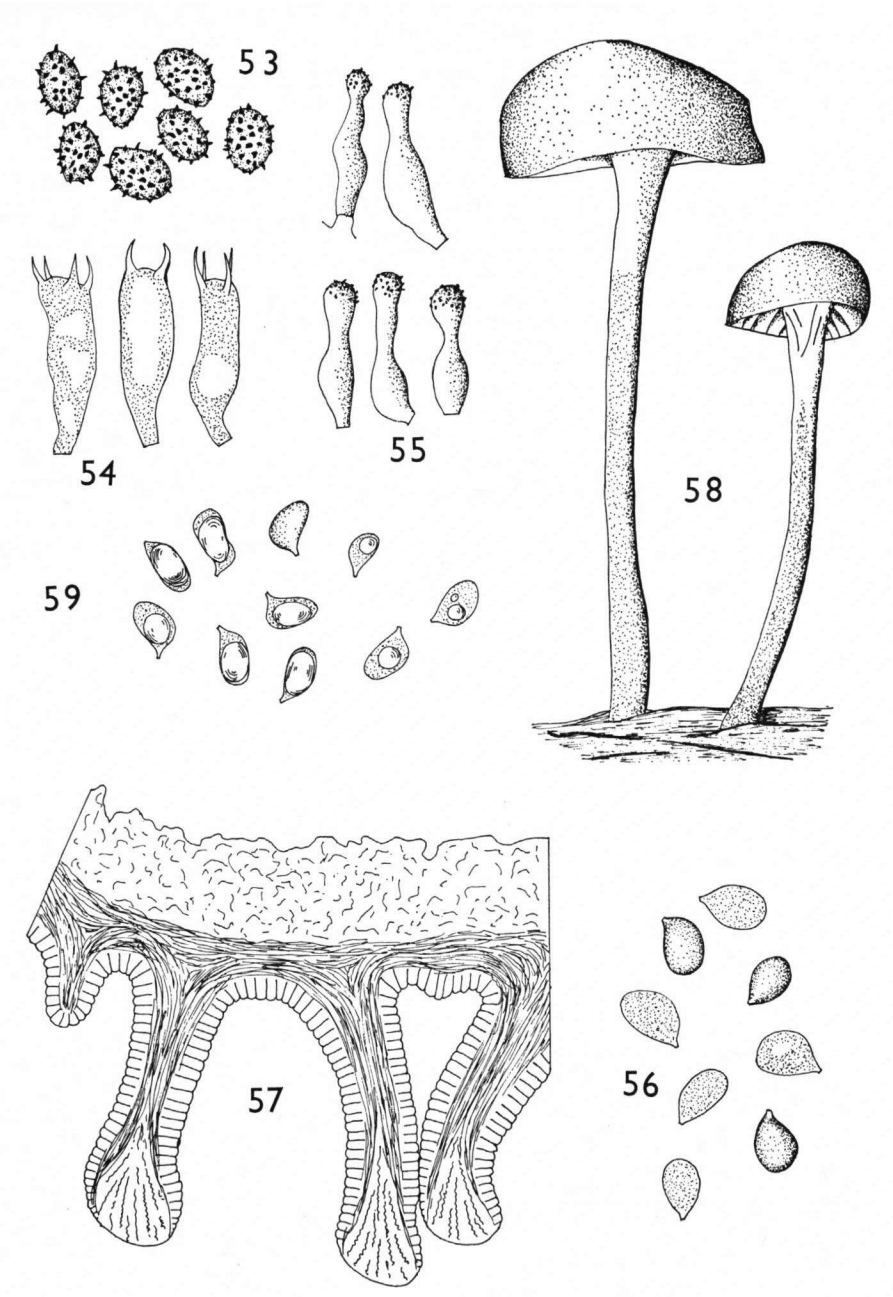
LENTINUS CAESPITICOLA Pat. & Har.—Text-figs. 60–63

Lentinus caespiticola Pat. & Har. *in* J. Bot., Paris **14**: 240. 1900.
Omphalia bulbosa Bres. *in* Annls mycol. **18**: 26. 1920.

Pileus 8–30 mm diam., at first convex becoming expanded, deeply umbilicate, umbrinous to fuscous then paler, finely villose, glabrescent; margin entire, straight then incurved. *Lamellae* decurrent, white to isabelline, narrow, moderately crowded with lamellulae; edge entire, concolorous. *Stipe* 15–20 × 1–2 mm, central, cylindric, expanding slightly towards the apex, concolorous with the pileus, pruinose, stuffed, swollen towards the base (up to 4–5 mm thick) to form a white strigose bulb. *Context* well developed, pale, inamyloid, consisting of loosely interwoven hyphae, 1.5–6 μ diam., which are thin- or thick-walled, branched and with abundant clamp-connexions. *Spores* 4.8–7.2 × (2.5–) 3–4.8 (6.5 × 4) μ, ellipsoid, hyaline, thin-walled, containing numerous small oil-guttules; inamyloid. *Basidia* 23–28 × 6–7.5 μ, claviform, bearing 4 sterigmata (up to 3 μ long). *Cheilocystidia* abundant, forming a sterile gill-edge, 24–33 (–46) × 7–11.5 μ, ventricose fusiform, often with an acute

EXPLANATION OF FIGURES 53–59

Figs. 53–55. *Gymnopilus njalensis*. — 53. Spores. — 54. Basidia. — 55. Cheilocystidia.
Figs. 56, 57. *Crepidotus spathulatus*. — 56. Spores. — 57. Vertical section through pileus and gills (× 100).
Figs. 58, 59. *Hygrophorus bipindensis*. — 58. Habit of sporophores (after Zenker) × 1. — 59. Spores. (All × 1000 unless otherwise stated.)



Figs. 53—59

apex, hyaline, thin-walled. *Pleurocystidia* 35–54 × 7–11.5 μ, fusiform to lageniform, often with a subcapitate apex, thin-walled, hyaline, with highly refractive contents. Occasionally there occur pleurocystidia with short, irregular branches towards the apex, but such forms are rare. *Hymenophoral trama* hyaline, irregular, devoid of a parallel or bilateral arrangement, consisting of mostly thick-walled hyphae 1.7–5 μ diam., with a very narrow lumen, and also a few thin-walled hyphae are present. Subhymenial layer well developed, 12.5–25 μ thick. *Pileus-surface* little differentiated, of firmly interwoven, repent, thick-walled hyphae, 3–5.5 μ diam., hyaline, occasionally branched. These form a layer 15–28 μ thick, which is distinct from the more loosely interwoven context.

Lentinus caespiticola: At the base of grass tufts. Koulikaro, West Sudan. 8 Aug. 1899. Legit *A. Chevalier* (PC, type); at base of grass stems, Niger. Legit *A. Chevalier* (FH); on burnt grass stems, Zanzibar. Jan. 1906. Legit *Le Testu* (FH).

Omphalia bulbosa: on grass roots, Moçambique. Comm. *C. Torrend*, no. *416* (S, type).

Lentinus caespiticola is a fairly small species, apparently restricted to growing on graminaceous stems and roots, with a wide distribution in Africa. The irregular hymenophoral trama and the abundant thin-walled cystidia are both atypical of *Lentinus*, but it was decided to retain this species within the genus because of the tough, rigid structure of the sporophore, the presence of thick-walled hyphae, and the well developed subhymenium. The type collection from West Sudan is in a suitable condition for analysis, and was found to contain abundant spores. Subsequent examination of type material of *Omphalia bulbosa* has shown this also to be fertile with similar spores, and agreeing in all other characters with *L. caespiticola*.

LENTINUS CAESARIATUS Pat.—Text-figs. 64, 65

Lentinus caesariatus Pat. *in* Bull. Mus. Hist. nat., Paris. **30**: 413. 1924.

Pileus 16–25 mm diam., convex soon expanded, deeply umbilicate, thin, reddish-brown with a greyish tint, radially fibrillose, with a few, innate squamules towards the disc; margin thin, straight, fimbriate. *Lamellae* arcuate decurrent, narrow, white, distant; edge denticulate. *Stipe* 17–25 × 1–1.5 mm, flexuous, attenuated towards the base, cylindric, hollow, white or greyish, covered by numerous small, white squamules; arising from a white mycelial disc. *Context* concolorous, inamyloid, 50–140 μ thick, consisting of interwoven hyaline hyphae, 2–5 μ diam., which are thin- or thick-walled, with abundant clamp-connexions. *Spores* 5.7–9 × 3–3.8 (6.8 × 3.3) μ, ellipsoid to cylindric, hyaline, thin-walled, containing several small oil-guttules. *Basidia* 15.5–22 × 3.5–4.5 μ, claviform-cylindric. *Cheilocystidia* and *pleurocystidia* absent. *Hyphal pegs* abundant, 25–100 × 8–30 μ, occurring both on the sides and on the edge of the lamellae; their constituent hyphae are thin-walled, 4–6 μ diam., with the contents staining deeply in aniline blue in lactic acid. *Hymenophoral trama* completely irregular, consisting of hyaline, interwoven, thick-walled hyphae, 1.5–8 μ diam., generally with a narrow lumen. Subhymenial layer little developed. *Pileus-surface* a cutis of repent, radially arranged, agglutinated hyphae, 2.3–4.5 μ diam., hyaline, thin- or thick-walled, often covered by a brown, granular, membrane pigment. All hyphae provided with clamp-connexions.

On dead *Mangifera* branches. Maromandia, Madagascar. February. Legit *R. Decary* (PC, type).

The structure of the hymenophoral trama and the very slight development of a subhymenium are both typical of the genus *Panus* Fr. It is clear from all the observed characters that this species is based upon small sporophores of *P. tigrinus* (Bull. ex Fr.) Sing.

PANUS PAPILLATUS P. Henn.

Panus papillatus P. Henn. *in* Bot. Jb. **22**: 95. 1895; **23**: pl. 14, fig. 9. 1897. — *Lentinus papillatus* (P. Henn.) P. Henn. *in* Bot. Jb. **38**: 124. 1905.

On decaying twigs. Ndian, Cameroun. 27 April 1892. Legit *P. Dusen*, no. *25a* (S, type).

The type is sterile but otherwise exhibits all the characters of *Chaetocalathus africanus* (Pat.) Sing., and is certainly a synonym of the latter. See p. 102.

PANUS PAPILLATUS f. PARADOXUS (P. Henn.) P. Henn.

Panus paradoxus P. Henn. *in* Bot. Jb. **23**: 547, pl. 14, figs. 8a–b. 1897. — *Panus papillatus* P. Henn. forma *paradoxus* (P. Henn.) P. Henn. *apud* Bres. & Sacc. *in* Bull. Soc. r. Bot. Belg. **38**: 153. 1899.

On twigs. Near Bipindi, Cameroun. Legit *G. Zenker*, no. *133* (S, type).

The type exhibits all the characters of *Chaetocalathus africanus* (Pat.) Sing., and is certainly a synonym of the latter. See p. 102.

PLEUROTUS PALMICOLA Beeli

Pleurotus palmicola Beeli *in* Bull. Jard. bot. État Brux. **15**: 38, pl. 3, fig. 23. 1938.

At the base of leaves of an old oil-palm. Njala, Sierra Leone. July 1935. Legit *F. C. Deighton*, no. *M. 768* (Type).

The type collection consists of several sporophores in good condition, preserved in alcohol, together with a spore-print. This small, grey, subgelatinous fungus represents a further synonym of *Resupinatus applicatus* (Batsch ex Fr.) S. F. Gray.

PLEUROTUS PROLIFER Pat. & Har.—Text-fig. 66

Pleurotus prolifer Pat. & Har. *in* Bull. Soc. mycol. Fr. **9**: 207. 1893.

The type collection consists of two well preserved sporophores which on analysis have revealed the following micro-characters: *Spores* 7.5–9 × 2.8–3.7 (8.2 × 3.2) μ, cylindric, hyaline, thin-walled, with few granular contents. *Cheilocystidia* not recovered. *Metuloids* absent. *Hymenophoral trama* completely irregular, hyaline, consisting of thick-walled hyphae, 3.4–9 μ diam., tightly interwoven. Subhymenial layer well developed, up to 12.5 μ wide. *Pileus-surface* a cutis of radially arranged, repent hyphae which are thick-walled, and not at all agglutinated, forming a layer 25–60 μ thick.

On decaying trunks, Brazzaville, Congo. Legit *Thollon* (FH, type).

The structure of the hymenophoral trama and the subhymenium indicate that this species has been correctly assigned to the genus *Pleurotus* (Fr.) Quél.

RHODOPHYLLACEAE Sing.

CLAUDOPUS TERRACCIANI Bres.—Text-figs. 67, 68

Claudopus terracciani Bres. *in* Annuar. R. Ist. Bot. Roma 5: 175, pl. 8, fig. 3. 1893.

Pileus 8–15 mm diam., suborbicular or reniform, thin, white, glabrous, radially rugulose, margin striate. *Lamellae* adnate, rounded posteriorly, at first white becoming flesh-pink, ventricose, moderately crowded. *Stipe* absent, or present as a very short, lateral protuberance, with a whitish fibrillose base. *Spores* 6.7–10.5 × 5.7–7 (9 × 6.6) μ, subglobose to broadly ellipsoid, angular, angles well marked, pink, thin-walled, with a prominent apiculus (1–2.3 μ long). *Basidia* 28.5–32 × 8–9.5 μ, claviform, bearing 4 sterigmata.

On wood, Fekerie-Ghemb Forest, Shoa Mountains, Ethiopia. 21 April 1885. Legit *V. Ragazzi*, no. *10* pr. p. (S, type).

The type collection consists of minute fragments only, and apart from details concerning the spores and basidia, it has not been possible to add to Bresadola's original description. This species would appear very close to *C. byssisedus* (Pers. ex Fr.) Gillet, which may be distinguished by the greyish-tinged pileal surface and more elongate spores.

RUSSULACEAE Roze

RUSSULA CONGOANA Pat.–Text-figs. 69–72

Russula congoana Pat. *in* Bull. Soc. mycol. Fr. **30**: 336. 1914.

Examination of the type collection, which consists of two well preserved sporophores, has revealed the following micro-characters: *Spores* 8.5–11 × 6.3–8 μ, subglobose to ellipsoid, hyaline, thin-walled, strongly amyloid, with prominent verrucae (0.6–1.2 μ high), inter-connected by a reticulate system of broad and narrow bands. The ornamentation approaches most closely the P7-type of Pearson's (1948) standards. *Basidia* 21–30 × 9.5–10.8 μ, broadly claviform, bearing 4 short sterigmata. *Cheilocystidia* 35–42 × 8.5–10.5 μ, similar to the pleurocystidia. *Pleurocystidia* abundant, 40–60 × 9.5–12.5 μ, typically macrocystidioid, elongate claviform to fusiform, frequently mucronate, thin-walled, containing highly refractive hyaline or yellowish contents. *Pileus-surface* an epicutis of erect or semi-repent hyphae, 1–2.5 μ diam., loosely arranged, intermixed with numerous elongate pilocystidia, 40–80 × 3–5 μ. This layer is supported by a broad hypodermium, 450–850 μ thick, of repent interwoven, gelatinized hyphae, 1.5–3.5 μ diam.

On the ground. Kaga M'Bra, Congo. 6 June 1912. Legit *M. Baudon*, no. *1666* (FH, type).

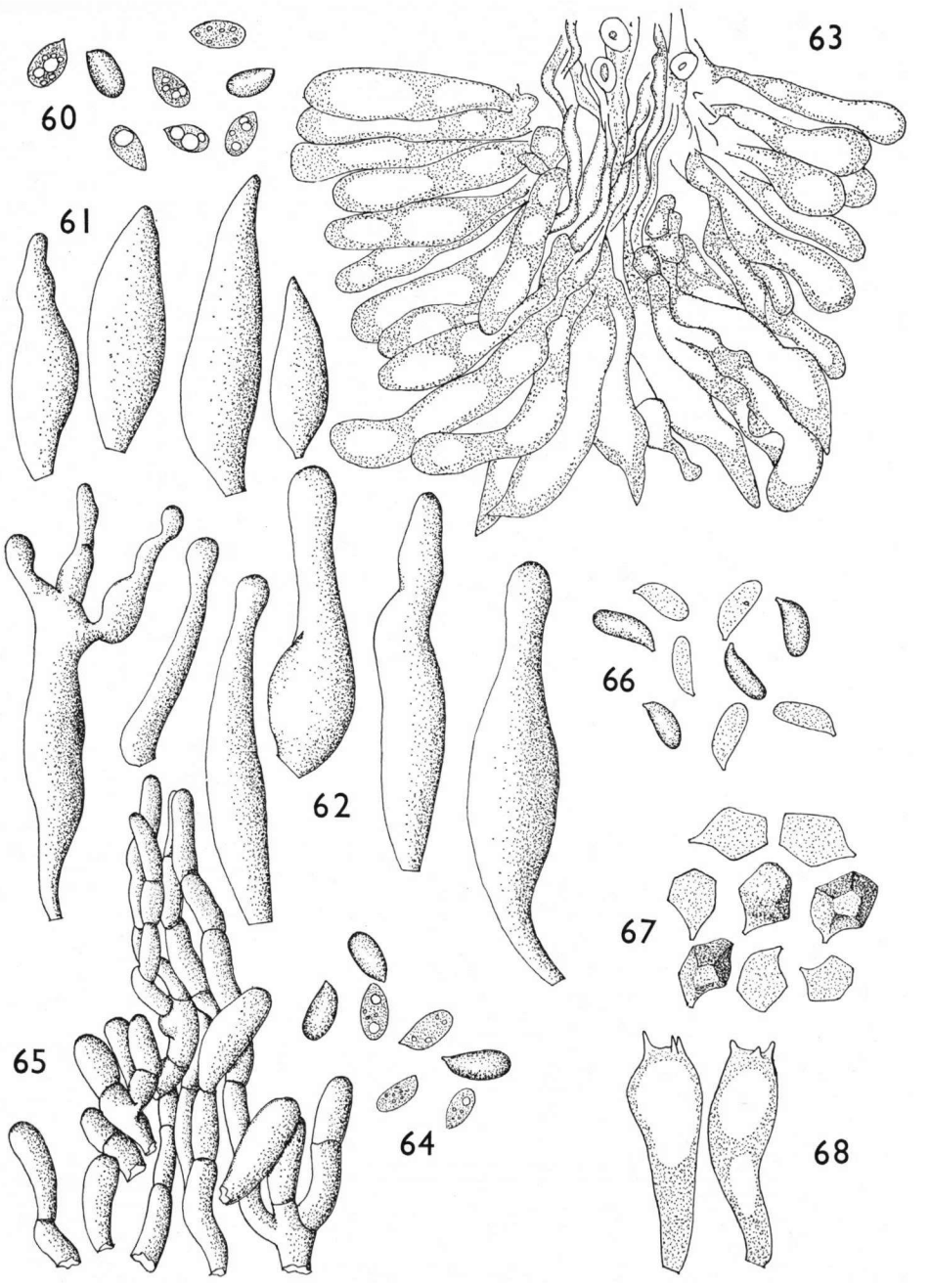
EXPLANATION OF FIGURES 60–68

Figs. 60–63. *Lentinus caespiticola.* — 60. Spores. — 61. Cheilocystidia. — 62. Pleurocystidia. — 63. Vertical section through gill-edge.

Figs. 64, 65. *Lentinus caesariatus.* — 64. Spores. — 65. Hyphal peg.

Fig. 66. *Pleurotus prolifer.* Spores.

Figs. 67, 68. *Claudopus terracciani.* — 67. Spores. — 68. Basidia. (All × 1000 unless otherwise stated.)



Figs. 60—68

The smooth, carmine-red pileus and the heavy ornamentation of the spores indicate that this species belongs in the section *Russula* of the genus *Russula* Pers. ex S. F. Gray.

STROPHARIACEAE Sing. & Smith

PHOLIOTA AGGREGATA Beeli—Text-figs. 77–81

Pholiota aggregata Beeli *in* Bull. Soc. r. Bot. Belg. **61**: 85, pl. 4, figs. 23a–b. 1928.

Pileus 3–11 mm diam., conical or conico-convex, then expanded conical, umbonate sometimes acutely so, 'Antimony Yellow' to 'Mustard Yellow', smooth, glabrous, non-striate, neither a viscid nor a gelatinized pellicle demonstrable. *Lamellae* adnexed with a tooth, pale greenish-yellow at first, darkening at maturity to 'Cinnamon', distant with only a few lamellulae; edge remaining pale. *Stipe* 10–25 × 1–2 mm, equal, cylindric, hollow, concolorous with the pileus, smooth or with an occasional evanescent, fibrillose, annular zone observed on the upper region. *Context* thin, greenish-yellow. *Spores* 5.5–7.5 × 3.2–4.3 (6.3 × 3.8) μ, ovoid to ellipsoid, yellowish-brown in NH_4 OH, darker in KOH, translucent, smooth, with a broad, slightly truncate germ-pore. *Spore print* 'Cinnamon'. *Basidia* 15.5–19 × 4.5–6 μ, claviform to cylindric, bearing 4 sterigmata. *Cheilocystidia* present, scattered amongst the basidia, 16–18 × 3.5–5.5 μ, lageniform to cylindric fusiform, hyaline, thin-walled. *Pleurocystidia* absent. *Chrysocystidia* numerous on the gill-face, occasionally present on the gill-edge, 25–34 × 8–10.5 μ, inflated claviform, frequently mucronate, thin-walled, containing a single, refractive, amorphous body, which appears yellow in NH_4 OH, stains deeply in aniline blue in lactic acid. *Hymenophoral trama* regular, up to 55 μ wide, consisting of hyaline of very pale brown, thin-walled, inflated hyphae, 4–8.5 μ diam. Subhymenial layer well developed, 7–10 μ wide, subcellular, hyaline. *Gloeo-vessels* absent in the context. *Pileus-surface* an epicutis of repent, brown, thin-walled hyphae, encrusted by a yellow resinous pigment; the individual elements are at times greatly inflated (up to 54 μ diam.). Underlying the epicutis is a hyaline, subcellular hypodermium, 12–15 μ thick. No gelatinized layers present. All hyphae provided with clamp-connexions.

On decayed trunk and stump. Mpanga Forest, Makerere University College, Uganda. Alt. 4,300 ft. 7 May 1964. Legit *E. A. Calder*, no. *97*.

Although the present author has not examined the type material of *P. aggregata* which was described from Eala, Congo, there can be little doubt that the collection cited above from Uganda represents the same species. *Pholiota aggregata* may be readily identified in the field by the formation of dense caespitose groups of small, brightly coloured sporophores, covering dead and decaying wood.

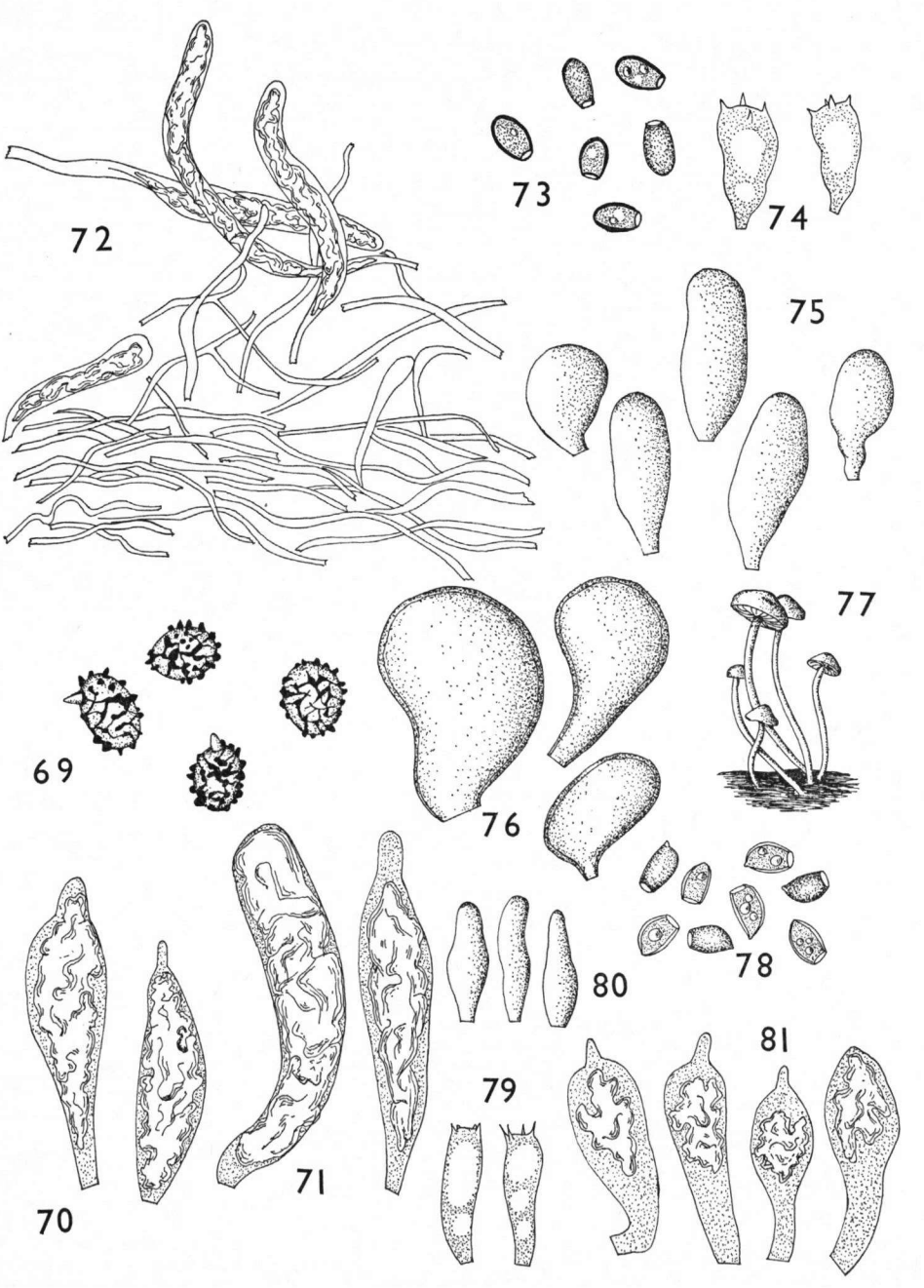
The inflated vesiculose elements of the pileus-surface provide an unusual feature

EXPLANATION OF FIGURES 69–81

Figs. 69–72. *Russula congoana*. — 69. Spores. — 70. Cheilocystidia. — 71. Pleurocystidia. — 72. Vertical section through pileus surface.

Figs. 73–76. *Psilocybe albobrunnea*. — 73. Spores. — 74. Basidia. — 75. Cheilocystidia. — 76. Epithelial sphaerocysts.

Figs. 77–81. *Pholiota aggregata*. — 77. Habit (× 1). — 78. Spores. — 79. Basidia. — 80. Cheilocystidia. — 81. Chrysocystidia. (All × 1000 unless otherwise stated.)



Figs. 69—81

for the family Strophariaceae, however the cinnamon-brown spore-print, the structure of the spores, and the presence of chrysocystidia indicate that the species has been correctly placed in the genus *Pholiota*. *Pholiota aggregata* belongs in the subgenus *Flammula* (Fr.) Sing. by virtue of the dry, glabrous pileus, and small spores.

PSILOCYBE ALBOBRUNNEA Beeli—Text-figs. 73–76

Psilocybe albobrunnea Beeli *in* Bull. Jard. bot. État Brux. **15**: 42, pl. 3. fig. 29. 1938.

The type collection consists of seven sporophores preserved in alcohol, together with a spore print. Examination of this material has revealed the following microscopic characters which may be used to supplement the original description: *Spores* 5·3–7·5 × 3·7–4·3 (6.4 × 4) μ, ellipsoid, fuscous, translucent, smooth, with a small, non-truncate germ-pore. *Basidia* 13–18 × 6.5–8.5 μ, broadly claviform, bearing 4 short sterigmata (up to 2.5 μ long). *Cheilocystidia* 11.5–24 × 7.5–11 μ, subglobose to pedicellate piriform or utriform, occasionally short cylindric, hyaline, thin-walled, with few cytoplasmic contents. *Pleurocystidia* absent. *Hymenophoral trama* subregular, reduced to a narrow zone by the well developed subcellular hymenopodium, hyaline in NH_4 OH, consisting of thin-walled, inflated hyphae. *Pileus-surface* a monostratous epithelium, of hyaline, thin-walled sphaerocysts, 9.5–23.5 μ diam., sometimes short pedicellate.

On a dead stump of *Cola nitida*. Njala, Sierra Leone. Nov. 1935. Legit *F. C. Deighton*, no. *M 881* (Type).

The cellular structure of the pileus-surface indicates that this species would be more correctly placed in the genus *Psathyrella* (Fr.) Quél. Beeli regarded *P. albobrunnea* as being scarcely distinct from *P. atrobrunnea* (Lasch) Gillet, a species variously interpreted but which is now widely recognised by modern workers as being the same as *Psilocybe turficola* J. Favre. This is a good species of *Psilocybe* with a filamentous pileus-surface. *Psilocybe albobrunnea* possesses all the characters of the subgenus *Hypholoma* (Fr.) Sing., and there can be little doubt that it represents a further synonym of *Psathyrella candolliana* (Fr.) Maire.

TRICHOLOMATACEAE Roze

ARMILLARIELLA DISTANS Pat.

Armillariella distans Pat. *in* Bull. Soc. mycol. Fr. **11**: 85, pl. 11, fig. 2. 1895.

Congo. Legit *M. J. Dybowski* (FH, type).

The type collection consists of seven small, black sporophores. These are immature and totally sterile without any development of the hymenium. The pileus-surface is little differentiated, consisting of interwoven, pigmented hyphae. It has not been possible to provide any additional information.

CHAETOCALATHUS AFRICANUS (Pat.) Sing.—Text-figs. 82–84

Chaetocalathus africanus (Pat.) Sing. *in* Lilloa **8**: 525. 1942.

Examination of the type material by the present author has revealed the following micro-characters: *Spores* 7–9.2 × 5–6.5 (7.8 × 6) μ, broadly ellipsoid, hyaline, thin-walled, neither amyloid nor dextrinoid. Only a few spores were observed, and these were often in a collapsed condition. *Basidia* 17.5–19.5 × 5–6 μ, hyaline, claviform.

Cystidia abundant, tramal in origin, 21–35 (–45) × 3–8.5 μ, thick-walled, hyaline or pale brownish, strongly dextrinoid, branching dichotomously at their apex to produce 2–6 fusoid arms (up to 14 μ long). These structures are initially to be found only on the gill-edge, but later spread to cover the entire gill-surface and displace the hymenium proper. *Hairs* on pileus-surface are unbranched, 2.5–5 μ diam., hyaline, strongly dextrinoid with a thickened wall which sometimes almost obliterates the lumen; 'ladder'-septation frequently occurs towards the tapering apex.

Loango, Congo. Legit *M. J. Dybowski* (FH, type).

A full description of this species has been published by Singer (1942).

CHAETOCALATHUS CONGOANUS (Pat.) Sing.—Text-figs. 85–87

Chaetocalathus congoanus (Pat.) Sing. *in* Lilloa **8**: 524. 1942.

Examination of the type material by the present author has revealed the following micro-characters: *Spores* fairly abundant, 6.8–8.5 × 4.5–5.7 (7.5 × 4.8) μ, ellipsoid, hyaline, thin-walled, dextrinoid. *Basidia* 24–28 × 5–6.5 μ, hyaline, claviform, bearing 4 sterigmata. *Cystidia* abundant, tramal in origin, 14–26 × 5.5–11 μ (above), 2–5 μ (at base), thick-walled, hyaline, dextrinoid, versiform with numerous short diverticulae giving a coralloid appearance. These are numerous on the gill-edge but are also found to a limited extent on the surface of the gill. *Hairs* on pileus-surface occasionally branched or nodulose towards the apex, 3–5.5 μ diam., hyaline, thick-walled, aseptate, with an obtuse apex; strongly dextrinoid.

On dead twigs. Coastal region, Congo. Jan. 1894. Legit *M. J. Dybowski*, No. *48* (FH, type).

Although *C. congoanus* and *C. africanus* appear very similar in habit, they may be easily separated microscopically. The most striking difference lies in the structure of the tramal cystidia, with the dichotomously branched arms found in *C. africanus* contrasting with the more nodulose appearance in *C. congoanus*.

Clitocybe hydrophora Pegler, *sp. nov.* —Text-figs. 88–91

Pileus 10–30 mm latus, e convexo mox expansus, profunde umbilicatus, ad discum olivaceo-brunneus, ad marginem pallide bubalinus, radialiter brunneo-striatus; margine tenue, fimbriato. Lamellae decurrentes, arcuatae, albidae vel cremeae, subdistantes; ad aciem integrae. Stipes 1.5–5 cm × 1–3 mm, cylindricus, ad apicem incrassatus, concoloratus, laevis, cavus. Caro tenuissima, inamyloidea. Sporae 6–8.5 × 3.3–5 (7.3 × 4.2) μ, ellipsoideo-amygdaliformes, hyalinae, tenuitunicatae, inamyloideae. Basidia 23–28 × 4.5–5.5 μ, cylindrico-claviformia, 4-sporigera. Cheilocystidia 43–55 × 6–10 μ, hyalina vel pallide brunnea, cylindrica. Pleurocystidia nulla. Trama hymenophoralis subregularis hyalina; hyphis tenuitunicatis, 2–4.5 μ diam. Hyphae cuticulae pilei repentes vel erectae, 3–7.5 μ diam., fibulatae. Pilocystidia 14–43 × 5–11 μ, perpauca, cheilocystidiis similia. Caulocystidia nulla. Hyphae fibulis praeditae.

Ad ramulos dejectos. Mpanga, Makerere University College, Uganda. Alt. 4,300 ft. 6 April 1964. Legit *E. A. Calder*, no. *38* (Typus).

Pileus 10–30 mm diam., convex soon expanded, deeply umbilicate from the first, 'Olive-Brown' at the disc, fading to 'Cartridge Buff' towards the margin, with fine, radial, dark brown striations. Margin thin, straight, fimbriate. *Lamellae* decurrent, arcuate, white to pale cream, subdistant, with a few lamellulae; edge entire, concolorous. *Stipe* 1.5–5 cm × 1–3 mm, attenuated towards the base, cylindric, smooth,

hollow, concolorous with the pileus, rather tough, growing from a small, basal, white mycelial disc. *Context* very thin, concolorous, inamyloid. *Spores* 6–8.5 × 3.3–5 (7.3 × 4.2) μ, ellipsoid to ellipsoid-amygdaliform, hyaline, thin-walled, inamyloid, usually containing a single, large, irregular oil-guttule. *Spore print* pure white. *Basidia* 23–28 × 4.5–5.5 μ, claviform-cylindric, bearing 4 short sterigmata. *Cheilocystidia* present though not abundant, 43–55 × 6–10 μ, thin-walled, hyaline or very pale brown, smooth, cylindric with an obtuse apex. *Pleurocystidia* absent. *Hymenophoral trama* subregular, of the *Clitocybe*-subtype with the outermost hyphae diverging toward the subhymenial layer. The hyphae are hyaline, 2–4.5 μ diam., thin-walled. Oleiferous ducts occasionally present in the context of the pileus. *Pileus-surface* an epicutis of repent hyphae, though at times fragmented and then the hyphae becoming curved to form a trichodermium. The hyphae are 3–7.5 μ diam., thin-walled, branched, septate with clamp-connexions, sometimes containing a pale brownish vacuolar pigment. *Pilocystidia* present, scattered, 14–43 × 5–11 μ, smooth, resembling the cheilocystidia though at times bifurcate. *Caulocystidia* absent. All hyphae provided with clamp-connexions.

On fallen twigs. Mpanga, Makerere University College, Uganda. Alt. 4,300 ft. 6 April 1964. Legit *E. A. Calder*, no. *38* (Type).

This small, lignicolous agaric with large, characteristic cheilocystidia would appear a somewhat anomalous species of *Clitocybe* Kummer. However the structure of the hymenophoral trama, the hygrophanous pileus, and the presence of clamp-connexions, all indicate that the species is best placed in this genus.

Clitocybe torrendii Pegler, *nom. nov.*—Text-fig. 92

Omphalia pallescens Bres. *in* Annls mycol. **18**: 26. 1920.

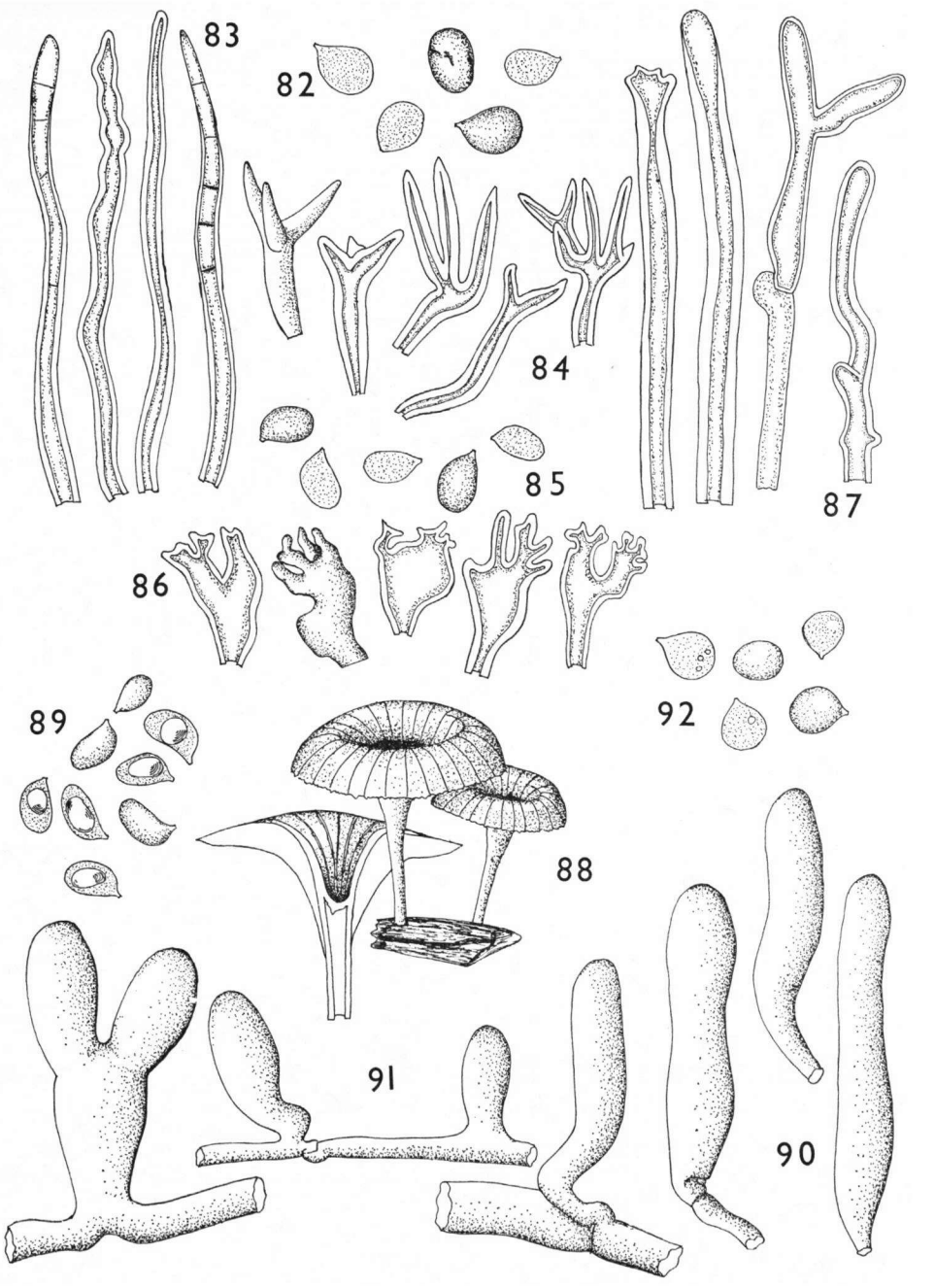
Pileus 15–25 mm diam., membranous, infundibuliform, pale tan, glabrous, margin striate. *Lamellae* broadly decurrent, at first white becoming alutaceous, moderately crowded with interveining. *Stipe* 2.5–4 cm × 2–4 mm, cylindric, expanding towards the base, hollow or stuffed, concolorous, glabrescent. *Spores* 6–7.7 × 5–6.5 μ, subglobose, hyaline, very thin-walled, inamyloid. *Basidia* 27–32 × 5.5–8 μ, claviform. *Cheilocystidia* and *pleurocystidia* absent. *Hymenophoral trama* subregular, of the *Clitocybe*-subtype, hyaline, inamyloid, consisting of thin-walled hyphae, 2–5.5 μ diam., becoming inflated up to 20 μ diam., with clamp-connexions at the septa. Subhymenial layer well developed, subcellular. *Pileus-surface* an epicutis of repent, hyaline, thin-walled hyphae, 2–5.5 μ diam., arranged in an essentially radial direction, but freely branched and interwoven. All hyphae provided with clamp-connexions.

On wood. Moçambique. Legit *C. Torrend* (S, type).

The above description was drawn from Bresadola's original diagnosis, but additional microscopical details have been added following an examination of the

EXPLANATION OF FIGURES 82–92

Figs. 82–84. *Chaetocalathus africanus*. — 82. Spores. — 83. Surface hairs. — 84. Cystidia.
Figs. 85–87. *Chaetocalathus congoanus*. — 85. Spores. — 86. Cystidia. — 87. Surface hairs.
Figs. 88–91. *Clitocybe hydrophora*. — 88. Habit of sporophore and section (× 1). — 89. Spores. — 90. Cheilocystidia. — 91. Pilocystidia.
Fig. 92. *Clitocybe torrendii*. Spores. (All × 1000 unless otherwise stated.)



Figs. 82—92

type collection. Although the type material is in rather poor condition, consisting of two fragmented sporophores, nevertheless a few spores have been recovered which agree closely with the measurements provided by Bresadola. This fairly tough species would appear better placed in the genus *Clitocybe* Kummer by reason of the regular hymenophoral trama, the complete absence of thick-walled hyphae, the absence of any incrusting membrane pigment, and the presence of conspicuous clamp-connexions. As the binomial *Clitocybe pallescens* already exists for another fungus, described by Bigelow (1948), the new name *Clitocybe torrendii* is herewith proposed, according to Art. 55 of the International Code of Botanical Nomenclature (1961). The species belongs in the subgenus *Clitocybe*, section *Clitocybe*.

Crinipellis calderi Pegler, *sp. nov.*—Text-figs. 93–96

Pileus 8–12 mm latus, e convexo expanso-planus, carnosulus, ad discum obscure fuscus, circa discum atrobrunneo-squamulosus; ad marginem pallide cinnamomeus, non squamulosus. Lamellae adnexae, cremeo-bubalinae, subventricosae, distantes, intervenosae. Stipes 20–35 × 1–2 mm, aequalis, cylindricus, cavus, ad basim atrofuscus, ad apicem albidus, crinibus paucis subtilibus praeditus. Caro tenuissima, pallida, inamyloidea. Sporae 9–11.7 × 3.2–4.5 (10.5 × 4) μ, elongato-ellipsoideae vel cylindricae, hyalinae, tenuitunicatae, inamyloideae, raro dextrinoideae. Basidia 34–46 × 4.5–8 μ, elongato-claviformia, 4-sporigera. Cheilocystidia 25–32 × 4–8 μ, hyalina, basidiiformia. Pleurocystidia nulla. Trama hymenophoralis subregularis, hyalina vel pallide brunnea. Crines pilei stipitisque dextrinoideae, apicibus obtusis vel acutis. Hyphae fibulis praeditae.

Ad ramulos mortuos. Mpanga 69, Makerere University College, Uganda. Alt. 4, 300 ft. 15 April 1964. Legit *E. A. Calder*, no. *52* (Typus).

Pileus 8–20 mm diam., convex then expanded-plane, thin, 'Burnt Umber' to 'Fuscous-Black' at the disc, fading to 'Light Vinaceous-Cinnamon' at the margin and covered by numerous furfuraceous squamules which become sparse towards the edge. The surface radially sulcate, the margin straight, undulate and entire. *Lamellae* adnexed, 'Cream-Buff', subventricose, distant with a few lamellulae, but conspicuous interveining. *Stipe* 20–35 × 1–2 mm, equal, cylindric, hollow, 'Fuscous-Black', at the base fading to almost white at the apex, longitudinally striate, with a delicate covering of fine hairs. *Context* very thin, pale, inamyloid. *Spores* 9–11.7 × 3.2–4.5 (10.5 × 4) μ, elongate ellipsoid to cylindric, hyaline, wall thin never thickening or showing any secondary septation, containing one to several highly refractive oil guttules; inamyloid though at times faintly dextrinoid. *Spore print* pure white. *Basidia* 34–46 × 4.5–8 μ, elongate claviform, bearing 4 sterigmata. *Cheilocystidia* intermixed with the basidia, 25–32 × 4–8 μ, hyaline, thin-walled, little differentiated from the basidia, with a slightly nodulose or subcapitate apex. *Pleurocystidia* absent. *Hymenophoral trama* subregular, hyaline or pale brown, consisting of filamentous, thin-walled hyphae, 1.5–4.5 μ diam., sometimes inflated up to 8 μ. Subhymenial layer little differentiated. *Pileus-surface* composed of fasciculate groups of unbranched hairs, produced by a well developed hypotrichium. *Hairs* 35–400 × 4–13 μ, subhyaline to dark brown, strongly dextrinoid, straight of flexuous, tapering towards the apex which may be acute or rounded; wall thickened up to 2 μ, either nonseptate or with irregular septation though never constricted, sometimes 'ladder' septation occurs towards the apex. *Hypotrichial layer* composed of branching chains of subcylindric, vesiculose elements, 40–70 × 7–20 μ, thin-walled, often bearing an incrusting membrane pigment, and containing abundant brown, cytoplasmic

contents. Hairs on stipe similar to those of the pileus though scattered, and not exceeding 250 μ in length. All hyphae with prominent clamp-connexions.

On dead twigs. Mpanga 69, Makerere University College, Uganda. Alt. 4,300 ft. 15 April 1964. Legit *E. A. Calder*, no. *52* (Type).

This deeply pigmented species of *Crinipellis* belongs to the section *Crinipellis* subsection *Stipitarinae* Sing. because of the presence of the elongate surface hairs, and the relatively undifferentiated cheilocystidia. The pileus and stipe are not strongly strigose as in many species within this group, and for this reason *C. calderi* probably approaches closest to *C. subtomentosa* (Peck) Sing., the cheilocystidia and spore-size would further support this view. *Crinipellis subtomentosa*, which has been recorded from North and West Africa, differs in the much paler pigmentation of the sporophore, broader spores (9–11.8 × 4.5–6 μ), and the structure of the pileus-surface.

Crinipellis glaucospora (Beeli) Pegler, *comb. nov.*—Text-figs. 97–99

Naucoria glaucospora Beeli *in* Bull. Jard. bot. État Brux. **15**: 39, pl. 3, fig. 25. 1938 (basionym).

Pileus 10–15 mm diam., at first convex becoming expanded, plane, pink with a reddish-brown disc, smooth except for the radially grooved margin. The surface is covered by fasciculate groups of reddish-brown hairs but is glabrous at the disc; margin entire, undulate. *Lamellae* adnexed to free, white, moderately crowded with numerous lamellulae; edge concolorous, serrulate. *Stipe* 10–25 × 1–1.5 mm, equal, cylindric, hollow, deep reddish-brown, with a fine covering of reddish-brown hairs. *Context* thin, pale brown, inamyloid. *Spores* 6–8.5 × 3.2–4 (7.3 × 3.5) μ, elongate ellipsoid, flattened on the adaxial side, often slightly curved towards the prominent apiculus, hyaline or with a pale greenish tint, thin-walled, smooth; inamyloid, non-dextrinoid. A number of spores deposited in the spore-print and on the pileus-surface have developed a thickened endogenous wall, which appears pale yellowish, and encloses all the cytoplasmic contents. The original, thin outer wall has, in many cases, collapsed to leave a thick-walled spore, appearing rectangular in profile. *Spore print* cream-coloured. *Basidia* 17–22 × 5.5–7.5 μ, claviform, bearing 4 short sterigmata. *Cheilocystidia* numerous, 17–26 × 4–6 μ, hyaline, thin-walled, versiform, ventricose below, fusiform, pointed or with a nodulose apex, occasionally with short lateral branches. *Pleurocystidia* 21–24 × 4–5.5 μ, sinuous fusiform, mostly pointed at the apex, some nodulose or with 1–3 very short, irregular branches, hyaline or sometimes with pale brownish contents, thin-walled, projecting beyond the hymenium. *Basidioles* abundant, fusiform, hyaline, comprising most of the hymenium. *Hymenophoral trama* subregular hyaline, consisting of thin-walled hyphae, 3–4.5 μ diam., which become considerably inflated (up to 20 μ diam.). Subhymenial layer little differentiated. *Pileus-surface* composed of a hypotrichium producing unbranched hairs. *Hairs* 30–550 × 4–10 μ, cylindric, sometimes ventricose at the base, obtusely rounded at the apex, hyaline or nearly so, thick-walled, with frequent secondary septa; inamyloid though strongly dextrinoid. The surface of these hairs is covered by an abundant granular incrustation. *Hypotrichial layer* up to 100 μ thick, composed of repent, inflated, thin-walled hyphae, in which the individual, smooth elements measure 5–23 μ diam. All hyphae provided with clamp-connexions.

In hollow trunk of living *Cynometra leonensis*. Njala, Sierra Leone. 2 July 1935. Legit *F. C. Deighton*, no. *M 747* (Type).

This species which gives a cream-coloured spore print is not in any way related to the genus *Naucoria* (Fr.) Kummer. The spores, when examined microscopically,

appear mostly hyaline, and only in a very few is there any greenish coloration. The dextrinoid hairs on the pileus and stipe are strongly indicative of *Crinipellis* Pat., and further investigation has shown all the other structures to be typical of this genus. It is best placed within the section *Crinipellis* subsection *Iopodinae* Sing. by virtue of the pink pigmentation in the pileus. *Crinipellis rubiginosa* Pat., an incompletely described species from Madagascar, approaches *C. glaucospora* in many respects but differs markedly in the dimensions of the sporophore. *Crinipellis perniciosa* (Stahel) Sing., from tropical America, differs in having a deep crimson pileus and a little white or lemon-yellow stipe.

An unusual feature is the endogenous production of a thickened wall in the spore, once it is released. A smilar structure was described by Singer (1942) for *C. mirabilis* Sing. It would seem likely to represent a xerophytic adaptation.

Hohenbuehelia chevalieri (Pat.) Pegler, *comb. nov.*—Text-figs. 100–103

Pleurotus chevalieri Pat. *in* J. Bot., Paris **8**: 212. 1894. (basionym).

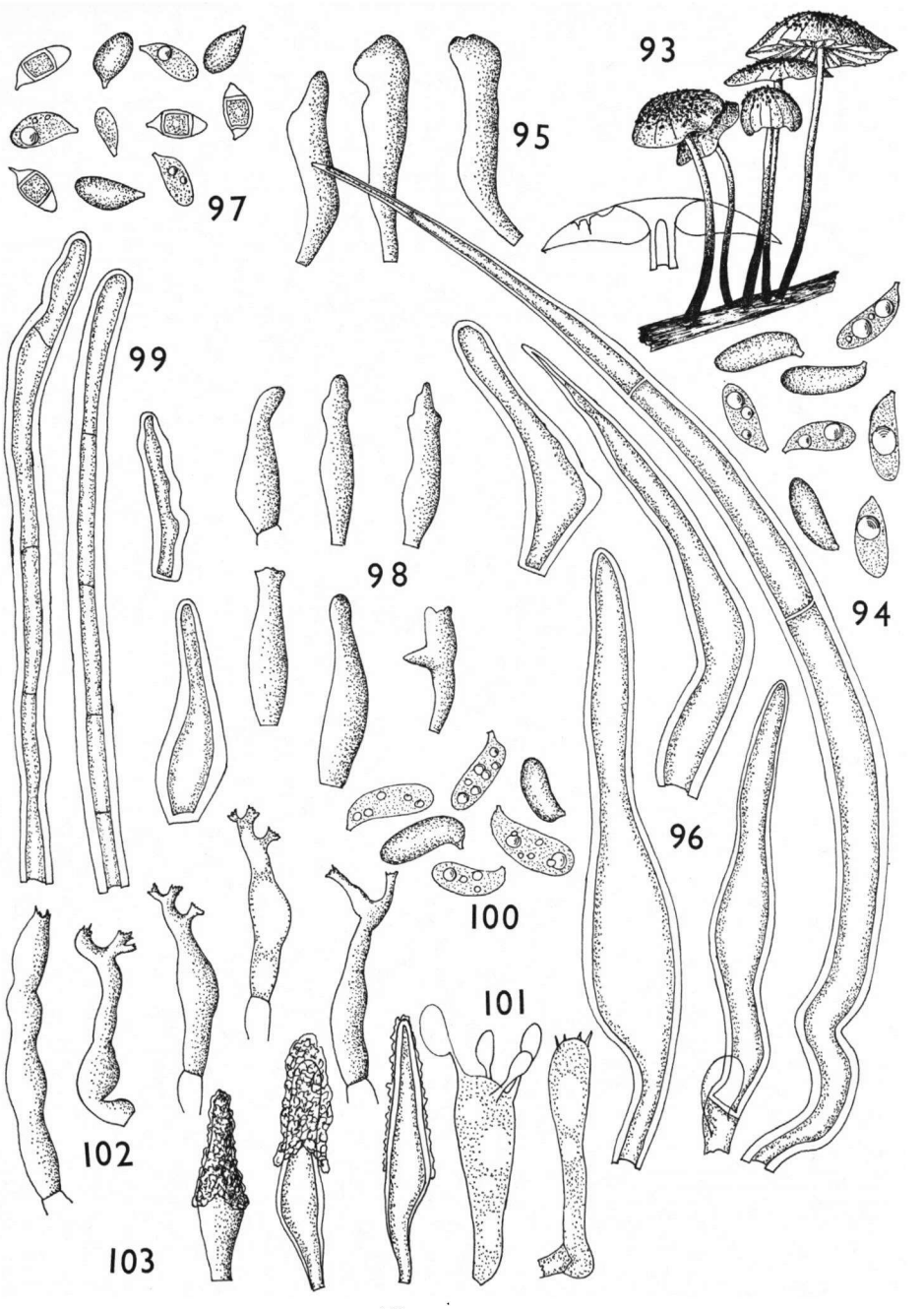
Pileus 6–15 mm diam., turbinate to cupuliform becoming reflexed, sessile, dorsally attached blackish-brown with the surface minutely hispid but glabrescent towards the margin; margin entire, even. *Lamellae* radiating from a central dorsal point, white to ash-grey, drying yellowish, narrow, subdistant with lamellulae; edge concolorous, serrulate. *Stipe* present as a small, white protuberance or absent. A pseudostipe is occasionally formed, but more often the pileus is attached directly to the dorsal surface. *Context* thick, hyaline, inamyloid, consisting of two distinct layers. The upper layer, 135–190 μ thick, is gelatinized, with loosely interwoven hyphae embedded in a hyaline matrix; in most cases the walls of the hyphae retain their identity. The lower layer, 300–630 μ thick, is non-gelatinized, composed of more compactly arranged hyphae, which readily stain in aniline blue in lactic acid. *Spores* 9–13.3 × 3.4–4.7 (11 × 4) μ, cylindric, curved towards the apiculus, sometimes slightly constricted, hyaline, thin-walled, with granular contents; inamyloid. *Basidia* 17–31 × 4.5–8.5 μ, elongate claviform, bearing 4 sterigmata (up to 4 μ long). *Cheilocystidia* leptocystidioid, 27–38 × 4.5–7 μ, hyaline, thin-walled, with few cytoplasmic contents, cylindric fusiform with several constrictions, generally branching apically into 1–4 branchlets, each branchlet bearing a fimbriate tip. *Pleurocystidia* absent. *Metuloids* abundant, 20–43 × 7–8 μ, occurring on both the gill-face and the gill-edge, fusiform or lageniform with an obtuse apex, hyaline to stramineous, with a thickened wall but usually retaining a broad lumen; upper region heavily encrusted. Many of these organs are deep-seated and distinctly tramal in origin. *Hymenophoral trama* hyaline, irregular, consisting of loosely interwoven hyphae, 2–3.5 μ diam., hyaline, thin-walled, with numerous clamp-connexions; slightly gelatinized. Subhymenial layer little developed. *Pileus-surface* essentially a trichodermium, consisting of vertically arranged hyphae which are aggregated,

EXPLANATION OF FIGURES 93–103

Figs. 93–96. *Crinipellis calderi.* — 93. Habit of sporophore (× 2). — 94. Spores. — 95. Cheilocystidia. — 96. Pileal hairs.

Figs. 97–99. *Crinipellis glaucospora.* — 97. Spores. — 98. Cheilocystidia. — 99. Pileal hairs.

Figs. 100–103. *Hohenbuehelia chevalieri.* — 100. Spores. — 101. Basidia. — 102. Cheilocystidia. — 103. Metuloids. (All × 1000 unless otherwise stated.)



Figs. 93—103

though not agglutinated, to form short stiff hairs, up to 400 μ long. The hyphae, 2.5–4.5 μ diam., are thick-walled, hyaline or light brown, occasionally branched, bearing numerous resinous incrustations; arising from a basal clamp-connexion. These hyphae are produced by an underlying, pigmented hypodermium, 25–36 μ thick, of repent, non-gelatinized hyphae.

On fallen, decaying twigs. Tebéssa, Algeria. Jan. 1893. Herb. N. Patouillard (FH, type).

Patouillard originally described this species as "voisine de *Pleurotus atrocaeruleus* Fr.", and subsequently Pilát (1935) regarded it as representing a depauperate form of the latter species. Following an examination of the type collection the present author has formed the opinion that *Pleurotus chevalieri* represents a fungus specifically distinct from *Hohenbuehelia atrocaerulea* (Fr. ex Fr.) Sing. It may be distinguished from the other known species within the stirps *Atrocaeruleus* by (i) the larger spores; (ii) the smaller metuloids with only a slightly thickened wall; (iii) the highly characteristic leptocystidia.

LEPISTA SORDIDA (Fr.) Sing.

Lepista sordida (Fr.) Sing. *in* Lilloa **22**: 193. 1951.

The following African collection has been received at Kew: Makerere Hill, Makerere University College, Uganda. Alt. 4,100 ft. 24 April 1964. Legit *E. A. Calder*, no. *70*. This species has not hitherto been reported from tropical Africa.

MARASMIELLUS NIGRIPES (Schwein.) Sing. var. **subcinereus** (Berk. & Br.) Pegler, *comb. nov.*—Text-figs. 104–108

Marasmius subcinereus Berk. & Br. *in* J. Linn. Soc. (Bot.) **14**: 37. 1873 (basionym).

Pileus 4–25 mm diam., very thin, convex campanulate, ranging from slightly depressed at the centre to distinctly umbilicate or even infundibuliform; bluish-white to greenish-grey, often dark brown at the centre. The pileus which is radially striate to the umbilicus or plicate, stains blue or greenish-blue when bruised. *Lamellae* white to pale cream, narrow, moderately crowded, adnate to decurrent, becoming interveined at maturity; staining blue on bruising. *Stipe* 10–40 × 2–5 mm, tough and wiry, black when fresh, brown on drying, covered by an extensive white pruina which may disappear in old sporophores; hollow, cylindrical or slightly tapering downwards, with the base sometimes dilated into a small, white mycelial disc (up to 1.5 mm diam.). *Context* very thin, rarely more than 250–300 μ in thickness, flexible, white. *Spores* tetrahedral with 4 radiating, triangular processes (up to 7 μ long, and 3–4 μ diam. at their base), distance from point to point 7–12 μ, hyaline, thin-walled, with fine granular contents, inamyloid. *Spore print* white. *Basidia* 22–25 × 4.5–5 μ, clavate to cylindric; 4-spored. *Cheilocystidia* present, forming a sterile gill-edge, 25–37 × 5–18 μ, elongate claviform, covered by many short diverticula, for up to two-thirds their length; the upper region often producing one to several finger-like appendages which become inflated to produce a subcapitate apex. *Pleurocystidia* absent, except for a few cheilocystidioid elements near the gill-edge. *Hymenophoral trama* irregular to subregular, consisting of hyaline filamentous hyphae, 1.5–3 μ diam., loosely interwoven, with clamp-connexions, not gelatinized. *Pileus-surface* consisting of a well differentiated epicutis with a *Rameales*-structure, of nodose-branched or coralloid pilocystidia, 10.5–28 × 5–11.5 μ, hyaline, devoid of pigment

incrustations. *Caulocystidia* numerous, 18–42 × 4–13 μ, hyaline, with numerous branched outgrowths, bearing terminally inflated vesicles.

In forest litter, mainly twigs. Mpanga 69, Makerere University College, Uganda. Alt. 4,300 ft. 13 April 1964. Legit *E. A. Calder*, no. *42*.

The distinctive appearance of the spores makes this pantropical fungus a readily recognisable species, for their stellate shape would place it in an isolated position within the section *Rameales* Lange of the genus *Marasmiellus* Murr. *Marasmiellus nigripes* was originally described by Schweinitz (1822) from North Carolina, U.S.A., later Pennington (1915) indicated a fairly wide North American distribution, and Dennis (1951) showed that the species occurred extensively throughout tropical America. Petch (1948) redescribed *Marasmius subcinereus* Berk. & Br. in his treatment of the *Marasmius* species of Ceylon, and emphasized that "the pileus and gills turn blue to greenish black when bruised." According to the collector's notes, the above Uganda material was found to "stain blue in places on injury." This character, together with a microscopic comparison of the Petch material, would strongly suggest the same fungus to be involved. Further, a water-colour sketch of the African material closely resembles an unpublished painting, deposited in the Kew herbarium, to which Berkeley & Broome referred for their original diagnosis.

A careful comparison of type material of *M. subcinereus* and authenticated material of *M. nigripes*, revealed no differences in their microscopic structure. However, there has never been any indication that specimens collected in America have shown a colour change on injury, and because of the importance of colour, particularly within the marasmioid genera, it is thought that the two forms should be kept separate. The new combination at the varietal level is herewith proposed.

Marasmiellus roseotinctus Pegler, *sp. nov.*—Text-figs. 109–113

Pileus 6–13 mm latus, e convexo vel conico-convexo expansus, obtuse umbonatus, ad discum roseus, ad marginem albidus, hygrophanus, laevis, margine striato. Lamellae adnatae vel subdecurrentes, ex albido pallide roseus, subdistantes; ad aciem sub lente pruinosae. Stipes insititius, 12–35 × 0.5–1 mm, aequalis, cylindricus, cavus, concoloratus. Caro tenuissima, pallide rosea, sicco luteo-brunnea. Sporae 6.5–8.7 × 3.5–4.5 (8 × 4) μ, elongato-ellipsoideae vel subcylindricae, hyalinae, inamyloideae. Basidia 12–14.5 × 4–5.5 μ, claviformia, 4-sporigera. Cheilocystidia 17–24 × 3.5–9 μ, hyalina, versiformia, nonnullis diverticulatis praedita. Pleurocystidia nulla. Trama hymenophoralis regularis, hyalina. Cellulae cuticulae pilei manifeste diverticulatae, cheilocystidiis similes. Hyphae fibulis praeditae.

Ad lignum putridum. Mpanga 69, Makerere University College, Uganda. Alt. 4,300 ft. 7 May 1964. Legit *E. A. Calder*, no. *98* (Typus).

Pileus 6–13 mm wide, convex to conico-convex, then expanded, obtusely umbonate, thin, 'Deep Rose Pink' to 'Alizarine Pink' at the disc, fading to white at the margin, hygrophanous, smooth, more or less radially striate at the margin. *Lamellae* adnate to subdecurrent, horizontal, white to pale pink, subdistant with a few lamellulae; edge entire, *sub lente* white pruinose. *Stipe* insititious, 12–35 × 0.5–1 mm, equal, cylindric, hollow, concolorous with the pileus. *Context* very thin, pale pink, drying yellowish-brown. *Spores* 6.5–9.7 × 3.5–4.5 (8 × 4) μ, elongate to subcylindric, with a prominent oblique apiculus, hyaline, thin-walled, always containing a large, some-

times irregular, refractive oil guttule; inamyloid. *Spore print* pure white. *Basidia* 12–14.5 × 4–5.5 μ, oblong-claviform, bearing 4 sterigmata (up to 3.5 μ long). *Cheilocystidia* present, 17–24 × 3.5–9 μ, hyaline, thin-walled, forming a sterile gill-edge variable in shape ranging from cylindric with a nodulose apex to highly branched with numerous short, finger-like diverticula. *Pleurocystidia* absent. *Hymenophoral trama* subregular, hyaline, non-gelatinous, consisting of thin-walled hyphae, 2.5–5 μ diam. inflating up to 9 μ diam. Subhymenial layer moderately developed, hyaline, subcellular, 5.5–8 μ wide. *Pileus-surface* an epicutis of typical *Rameales* structure; individual elements small, 12.5–18 × 4–8 μ, hyaline, similar to the cheilocystidia. *Caulocystidia* present though scattered, 22–34 × 3.5–12 μ, hyaline, thin-walled, branched with several diverticulae. All hyphae provided with clamp-connexions.

On decaying wood. Mpanga 69, Makerere University College, Uganda. Alt. 4,300 ft. 7 May 1964. Legit *E. A. Calder*, no. *98* (Type).

This small, delicate species is characterised by its caespitose habit, and pinkish coloration. The central stipe and the epicuticular structure of the pileus places *M. roseotinctus* within the section *Rameales* Lange of the genus *Marasmiellus*.

MARASMIUS ARBORESCENS (P. Henn.) Beeli

Collybia arborescens P. Henn. *in* Bot. Jb. **22**: 106. 1895. — *Marasmius arborescens* (P. Henn.) Beeli *in* Bull. Soc. r. Bot. Belg. **60**: 156, pl. 3, fig. 10. 1928.

This species is widespread throughout tropical Africa. The following collections have been received at Kew: Botanic Garden, Ibadan, Nigeria. May 1963. Legit *S. O. Alasoadura*, no. *8*; Makerere University College, Uganda. 16 April 1964. Legit *A. Ojong*. Comm. *E. A. Calder*, no. *48*; Mpanga baseline, Makerere University College, Uganda. Alt. 4,300 ft. 20 April 1964. Legit *E. A. Calder*, no. *64*; Uganda. Legit *T. D. Maitland*.

For full descriptions of this species see Heim (1948) and Singer (1964a, 1965).

MARASMIUS BEKOLACONGOLI Beeli

Marasmius bekolacongoli Beeli *in* Bull. Soc. r. Bot. Belg. **60**: 157, pl. 3, fig. 12. 1928.

The following East African collections have been received at Kew: Mpanga Forest, Uganda. 30 March 1957. Legit *A. French*, no. *18*; Mpanga 69, Makerere University College, Uganda. 5 May 1964. Legit *A. Ojong*. Comm. *E. A. Calder*, no. *91*; Nyamberi Hills, Kenya. Alt. 6,500–6,800 ft. 12 Oct. 1960. Legit *B. Verdcourt*, no. *2981 A*.

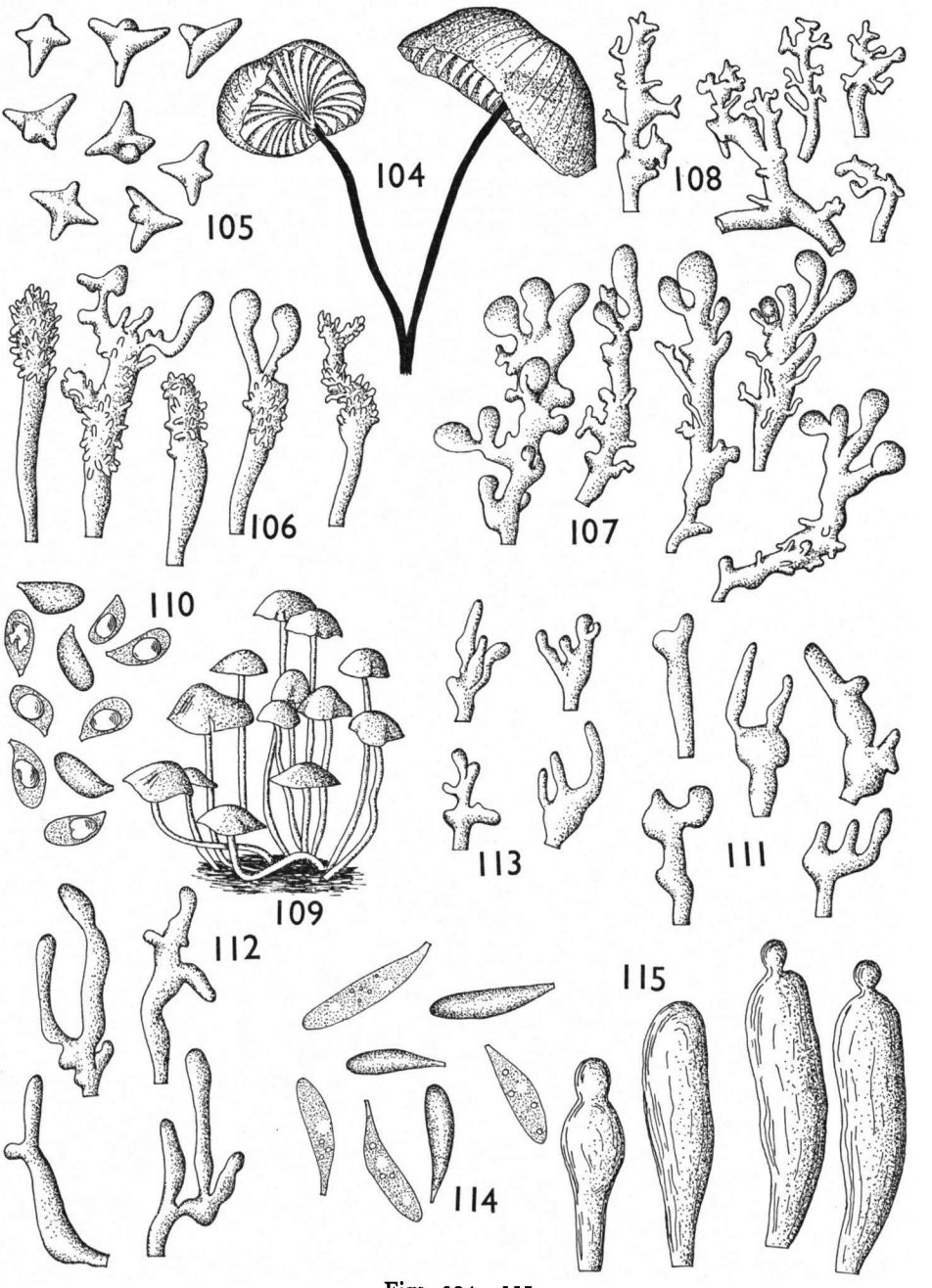
For a full description of this species see Singer (1964a, 1965).

EXPLANATION OF FIGURES 104–115

Figs. 104–108. *Marasmiellus nigripes* var. *subcinereus*. — 104. Habit of sporophore (× 1). — 105. Spores. — 106. Cheilocystidia. — 107. Caulocystidia. — 108. Epicuticular elements.

Figs. 109–113. *Marasmiellus roseotinctus*. — 109. Habit of sporophore (× 1). — 110. Spores. — 111. Cheilocystidia. — 112. Caulocystidia. — 113. Epicuticular elements.

Figs. 114, 115. *Marasmius haematocephalus*. — 114. Spores. — 115. Gloeocystidia. (All × 1000 unless otherwise stated.)



Figs. 104—115

Marasmius bubalinus Pegler, *sp. nov.*—Text-figs. 116–122

Pileus 5–20 mm latus, e umbonato-campanulato leviter expansus, interdum umbilicatus, pallide ochraceo-bubalinus, ad discum cinnamomeus, radiato-rugosus. Lamellae non-collariatae, liberae, sinuato-ventricosae, pallide brunneae, subdistantes, ad aciem concolores, serratae. Stipes insititius, 3–5 cm × 0.5–3 mm, aequalis, cylindricus, pileo concolor, e farcto cavus, laevis, striatus, glaber, non laccatus. Contextus pallide brunneus, inamyloideus. Sporae 6.5–8.2 × 3–4 (7.5 × 3.6) μ, oblongo-amygdaliformes, hyalinae, tenuitunicatae, inamyloideae. Basidia 17–25 × 5–6 μ, claviformia, 4-sporigera. Cheilocystidia 16–28.5 × 4.5–11.5 μ, hyalina, versiformia, nonnullis ramosis cristatis. Pleurocystidia nulla. Basidiolae copiosae, 18–28 × 4–5.5 μ, fusiformes. Trama hymenophoralis subregularis. Cellulae cuticulae pilei *Sicci* typo similes. Hyphae fibulis praeditae.

Inter graminos mortuos et ramulos dejectos. Makerere University College, Uganda. Alt. 4,100 ft. 23 April 1964. Legit *A. Ojong*. Comm. *E. A. Calder*, no. *71* (holotypus); East slopes, Mt Elgon. Summer 1963. Legit *Mrs. P. H. Irwin* (paratypus).

Pileus 5–20 mm diam., umbonate-campanulate, occasionally umbilicate, becoming slightly expanded, 'Pale Ochraceous Buff' darkening to 'Cinnamon' at the umbo, radiately ridged to the disc even in dried material. *Lamellae* non-collariate, free, sinuate ventricose, pale brown, moderately spaced with numerous lamellulae, often strong interveining; edge concolorous, very irregular. *Stipe* insititious, 3–5 cm × 0.5–3mm, equal, cylindric, stuffed then hollow at maturity, with fine longitudinal ridges, concolorous with the pileus or slightly paler at the apex, smooth, glabrous, but devoid of any silky sheen, and without any deposition of a resinous cuticle. *Context* relatively thick at the apex, but very thin towards the margin, pale brown, inamyloid. *Spores* 6.5–8.2 × 3–4 (7.5 × 3.6) μ, oblong amygdaliform, slightly depressed on the adaxial side towards the apiculus, hyaline, thin-walled, containing one or more small oil-guttules; inamyloid. *Spore print* pure white. *Basidia* 17–25 × 5–6 μ, claviform, bearing 4 sterigmata. *Cheilocystidia* numerous, 16–28.5 × 4.5–11 μ, thin-walled, versiform with several apical and lateral branches, which are often cristate at their apices; intermixed with the basidia. *Pleurocystidia* absent. *Basidioles* 18–28 × 4–5.5 μ, hyaline, fusiform, very numerous particularly on the sides of the lamellae. *Hymenophoral trama* subregular, hyaline, with loosely interwoven, axillary-arranged hyphae; the hyphae are thin-walled, inamyloid, and irregularly inflated (up to 8.5 μ diam.). Subhymenial layer broad, 8–17 μ diam., subcellular. *Pileus*-surface a hymeniform epicutis, consisting of versiform elements of the *Siccus*-type, 13–24 × 5–13.5 μ, hyaline, thin-walled, with branches bearing digitiform apices. *Caulocystidia* absent. All hyphae provided with clamp-connexions.

Amongst grass debris and fallen twigs. Makerere University College, Uganda. Alt. 4,100 ft. 23 April 1964. Legit *A. Ojong*. Comm. *E. A. Calder*, no. *71* (holotype); East slopes, Mt. Elgon, Kenya. Late Summer 1964. Legit *Mrs. P. H. Irwin* (paratype).

Marasmius bubalinus may be placed in the section *Leveilliani* Sing. of the genus *Marasmius* Fr. by virtue of the presence of an insititious stipe, epicuticular elements which are of the *Siccus*-type, the non-collariate lamellae, and the absence of pleurocystidia. The micro-characters both of the pileus-surface and of the hymenophore agree very closely with those of *M. leveillianus* (Berk.) Pat., particularly in the epicuticular elements, the cheilocystidia, and the fusoid basidioles. The spores are also very similar in shape and structure, although those of *M. bubalinus*, which were taken from a spore-print, are slightly shorter than the spores of *M. leveillianus* (8.3 × 3.7 μ), a difference reflected in the size of the basidia. Nevertheless there do exist a

number of other differences which suggest that more than one species is involved.

Marasmius leveillianus has a dark reddish-brown, convex pileus which soon becomes expanded, whilst the pileus of *M. bubalinus* is distinctly campanulate, never fully expanded, and is very light brown in colour. The difference in the pileus coloration is very marked in dried material as well as in living collections. It is in the structure of the stipe, however, that the most fundamental differences are found to occur. The stipe of *M. leveillianus* is a very dark brown, with a smooth, shiny and horny surface, and hollow from the start. On soaking up the dried material, no appreciable swelling occurs. In *M. bubalinus*, the stipe is very pale, there is no shiny, horny crust, and on immersing the dried material in water an immediate and substantial swelling occurs. Transverse sections made of these stipes also reveal a number of differences at the cellular level. The stipe of *M. leveillianus* (Fig. 124) is composed of three distinct regions. The surface layer of hyphae are fairly thin-walled but heavily coated by a dark, resinous incrustation, forming an impermeable cuticle. Within this layer is a very broad zone, comprising 60–80 per cent of the stipe material of very thick-walled, closely compacted, parallel-arranged hyphae, their walls staining deeply in aniline blue in lactophenol. The innermost layer is a narrow zone, 10–20 μ wide, of thin-walled, filamentous hyphae which form the lining to the central cavity of the stipe. All the hyphae have clamp-connexions at their septa. A cross-section through the stipe of *M. bubalinus* (Fig. 122) reveals no external cuticle, and no distinctive 'epidermal' zone. The entire stipe is formed of parallel-arranged hyphae, which have only slightly thickened walls and always retain a broad lumen. These hyphae are closely compacted towards the periphery, but large inter-hyphal spaces appear towards the centre of the stipe. If a central cavity is present it is only produced by the gradual break-down and pulling apart of the innermost hyphae, during the latter stages of the sporophore. The lack of a horny cuticle and thick-walled hyphae would explain the immediate revival of the dried material upon soaking.

MARASMIUS FAVOLOIDES P. Henn.—Text-figs. 125–129

Marasmius favoloides P. Henn. *in* Bot. Jb. **22**: 99. 1895.

Pileus 15–30 mm diam., at first convex umbonate, soon expanded to plane or slightly umbilicate, very thin, 'Lilac Gray' to 'Cinereous', sometimes 'Light Cinnamon-Drab' at the disc; smooth, strongly radiately ridged; margin entire, undulate. *Lamellae* adnate to decurrent, cream or with a very pale brownish tint, straight to arcuate, distant but strongly connected by prominent interveining to give a reticulate appearance; edge serrulate. *Stipe* 2–7 cm × 1–3.5 mm, equal or attenuated towards the base, cylindric, hollow, 'Cinnamon-Brown' at the base gradually fading to white at the apex, smooth, white pruinose at the apex, glabrous below; abundant white, basal mycelium. *Context* very thin, concolorous, inamyloid, dextrinoid. *Spores* 5–6.5 × 3–3.7 (5.7 × 3.4) μ, ellipsoid, hyaline, smooth, thin-walled, with rather granular contents; inamyloid. *Spore print* pure white. *Basidia* 20–25 × 3.5–5 μ, elongate claviform, bearing 4 short sterigmata. *Cheilocystidia* and *pleurocystidia* absent. *Hymenophoral trama* subregular, hyaline, consisting of somewhat interwoven, thin-walled hyphae, 2.5–5 μ diam., inamyloid though strongly dextrinoid.

Subhymenial layer well developed, 7.5–10 μ wide, hyaline. *Pileus-surface* strictly hymeniform, consisting of hyaline, vesiculose elements, 10–24 × 8–14 μ, subglobose to pedicellate piriform, occasionally obpiriform or short lageniform; thin-walled, smooth; no pilocystidia. Underlying this layer is a hypodermium of horizontal, parallel-arranged, hyaline hyphae, 2–4 μ diam. *Caulocystidia* abundant towards the apex of the stipe, 16–35 × 8.5–13 μ, hyaline, vesiculose, similar to the elements of the pileus-surface. All hyphae provided with clamp-connexions.

Amongst damp forest litter. Makerere University College, Uganda. 16 April 1964. Legit *A. Ojong*. Comm. *E. A. Calder*, no. *49*.

Although it has not been possible to trace the type collection of *M. favoloides*, there can be little doubt that the fungus described above represents Hennings' species which was collected in the Cameroun. The Uganda collection agrees with the original diagnosis in every detail, including the spore size, and the reticulate configuration of the hymenophore makes the species easily recognisable. Hennings related the species to *M. umbonatus* Peck, a coniferous species from North America, with a tomentose stipe. However Singer (1943) investigated the structure of Peck's fungus, and reported a repent, filamentous cuticle. It was accordingly transferred to the genus *Collybia*.

The hymeniform pileus-surface, together with the inamyloid context and gill-trama, indicates that this species belongs within the section *Alliacei* Kühn. of the genus *Marasmius*.

MARASMIUS HAEMATOCEPHALUS (Mont.) Fr.—Text-figs. 114, 115

Marasmius haematocephalus (Mont.) Fr., Epicrisis 376. 1838.

This small, common species of *Marasmius* has a widespread pantropical distribution, the following African collections have been received at Kew: On logs. Kipayo, Uganda. Alt. 4,000 ft. April 1915. Legit *R. Dümmer*; On leaf litter, Kigoma District, Tanganyika. 26 Jan. 1964. Legit *K. A. Pirozynski*, no. *M 348*; On dead leaves and twigs. Mpanga 69, Makerere University, Uganda. Alt. 4,300 ft. 9 April 1964. Legit *A. Ojong*. Comm. *E. A. Calder*, no. *29*.

The small sporophores may be recognised by the blood-red to deep purple pigmentation of the pileus; the elongate-fusiform spores, 16–20 × 3–4.5 μ, the cheilocystidia and pilocystidia of the *Siccus*-type; and the projecting, refractive gloeocystidia, 26–47 × 6–17 μ, on the sides of the lamellae.

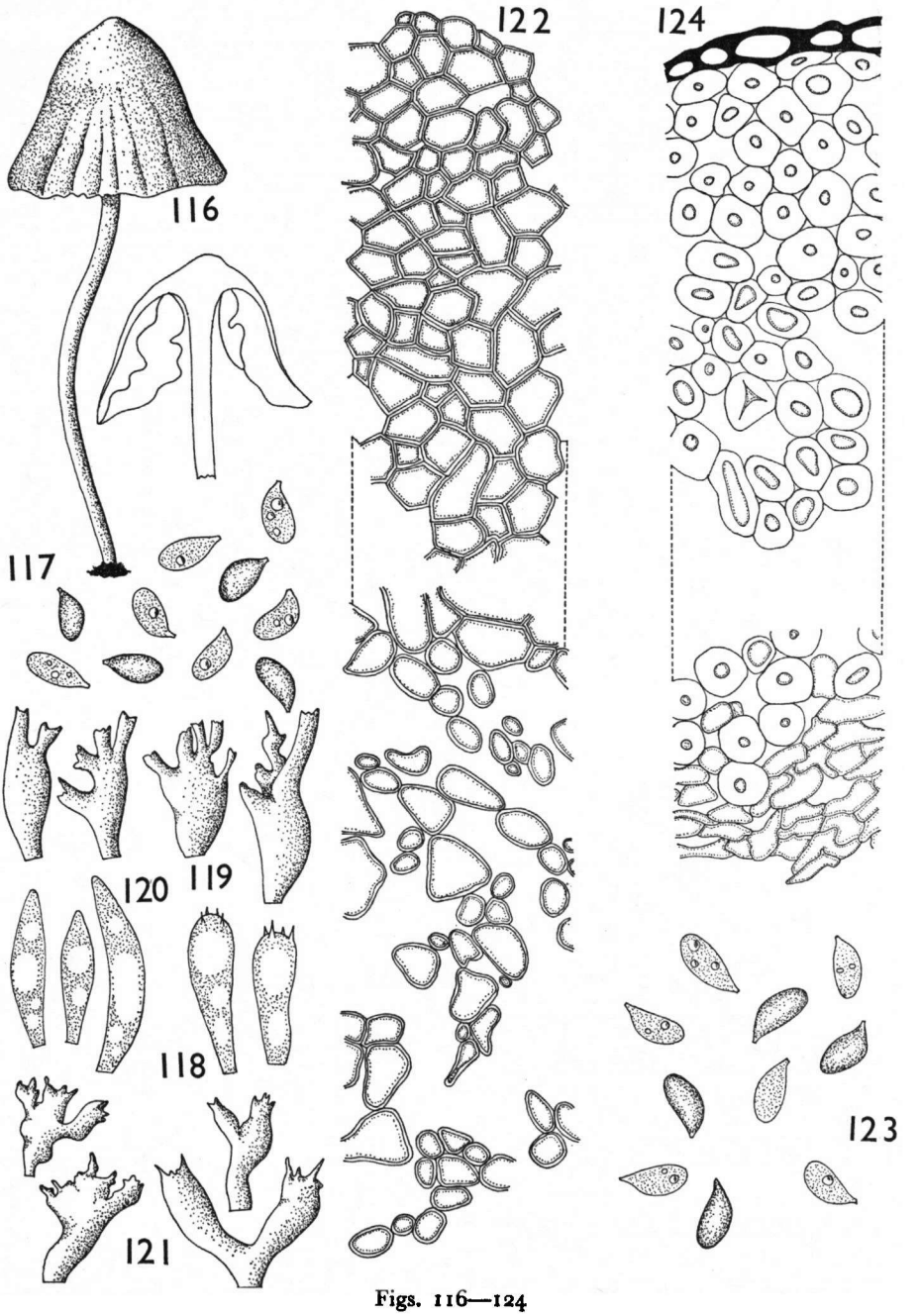
MARASMIUS KROUMIRENSIS (Pat.) Sacc. & Syd.—Text-figs. 130, 131

Androsaceus kroumirensis Pat., Cat. Pl. Cell. Tunis. 32. 1897. — *Marasmius kroumirensis* (Pat.) Sacc. & Syd., Syll. Fung. **14**: 105. 1899.

EXPLANATION OF FIGURES 116–124

Figs. 116–122. *Marasmius bubalinus*. — 116. Habit of sporophore and section (× 2). — 117. Spores. — 118. Basidia. — 119. Cheilocystidia. — 120. Basidioles. — 121. Epicuticular elements. — 122. Radial section through the stipe.

Figs. 123, 124. *Marasmius leveillianus*. — 123. Spores. — 124. Radial section through the stipe. (All × 1000 unless otherwise stated.)



Figs. 116—124

Pileus 1–2 mm diam., strongly convex becoming expanded, broadly umbonate, thin, fuscous, with 5–6 radial grooves; sinuate at the margin. *Lamellae* adnate, white, thin, distant, only 7–8 present, no lamellulae, non-collariate; edge concolorous with the pileus. *Stipe* 7–10 mm long, filiform, cylindric, hollow, reddish-brown, glabrous. *Spores* not recovered. *Basidia* 16.5–19.5 × 5–6 μ, claviform, bearing 4 short sterigmata. *Cheilocystidia* abundant, 12.5–20 × 5.5–12 μ, hyaline or with a pale brown membrane pigment, thin-walled, forming a sterile gill-edge, varying in shape from subglobose to piriform, occasionally more elongate, upper regions heavily ornamented with pronounced conical verrucae (1–3.5 μ long). *Pleurocystidia* numerous, 19.5–36 × 3–5.5 μ, fusiform to lanceolate, often mucronate, hyaline, thin-walled, with a fine, granular incrustation at the apex. *Hymenophoral trama* hyaline, subregular, consisting of thin-walled, inflated hyphae, 2–5 μ diam., with clamp-connexions at the septa. Subhymenial layer subcellular. *Pileus-surface* strictly hymeniform; consisting of subglobose elements of the *Rotalis*-type, which may be catenulate, somewhat agglutinated; individual elements 12–17 × 7–12 μ, verrucose, similar to the cheilocystidia, reddish-brown, walls often thickened considerably (up to 4 μ) in the region of the verrucae.

Amongst decaying leaves. Aïn Darham, Tunisia. July 1895. Legit *N. Patouillard* (FH, type).

The type collection is in an extremely poor condition, consisting of a solitary stipe with a tiny fragment of the pileus, and so it has not been possible to add to the macro-characters anything beyond those supplied by Patouillard. However, it is clear from the microscopical evidence that *M. kroumirensis* is typical of the section *Hygrometrici* Kühn. of the genus *Marasmius* Fr. It is very closely related to *M. echinosphaerus* Sing., described from the Congo, and may subsequently be found to represent the same species.

MARASMIUS LEVEILLIANUS (Berk.) Pat.—Text-figs. 123, 124

Heliomyces leveillianus Berk. *in* Hooker Lond. J. Bot. **6**: 490 bis. 1847. — *Marasmius leveillianus* (Berk.) Pat. *in* Bull. Soc. mycol. Fr. **33**: 55. 1917.
Marasmius umbraculum Berk. & Br. *in* J. Linn. Soc. (Bot.) **14**: 36. 1873.

On decaying wood. Hautane, Ceylon. July 1844. Legit *Gardner*, no. *72* (type of *H. leveillianus*). Peradeniya, Ceylon. Oct.–Dec. 1868. No. *807* (type of *M. umbraculum*). Mpanga Forest, Uganda. Spring 1957. Legit *A. French*, no. *47*.

This species was originally described by Berkeley from Ceylon, and has more recently been recorded from the Congo by Singer (1964a). Examination of the type material has revealed abundant spores which measure 7.2–9.5 × 3.3–4.4 (8.3 × 3.7) μ. Petch (1948) listed *M. umbraculum* Berk. & Br., also described from Ceylon, as a synonym. Subsequent examination by the present author of the type material of this latter species has confirmed this opinion.

For further details concerning the micro-structure of *M. leveillianus*, see under *M. bubalinus*.

Melanoleuca tropicalis Pegler, *sp. nov.*—Text-figs. 132–136

Pileus 20–55 mm latus, convexus dein expansus, leviter umbonatus, subhygrophanus, laevis, glaber, ad discum ochraceo-bubalinus, ad marginem pallidius cremeotinctus involutus.

Lamellae albidae, sinuatae, confertae, ad aciem integrae. Stipes 4–7 cm × 4–7 mm, aequalis, ad basim clavato-bulbosus, primo albidus, dein pileo concolor, glaber. Caro tenuissima. Sporae 7.5–10 × 4.5–5.5 (8.4 × 4.7) μ, ellipsoideae vel ellipsoideo-oblongatae, hyalinae, forte asperulatae (sec. typum VI Singeri), amyloideae. Pleurocystidia moderate numerosa, 34–48 × 4.7–7.5 μ, tenuitunicata, hyalina, subulata vel lagenitormia ad apicem acuta, semper septo transverso praedita, cheilocystidia similia vel nulla. Trama hymenophoralis stricte regularis. Hyphae cuticulae pilei hyalinae, 3–8 μ diam. Hyphae defibulatae.

In pratum. Makerere University College, Uganda. Alt. 4,100 ft. 21 April 1964. Legit *E. A. Calder*, no. *69* (Typus).

Pileus 20–55 mm diam., convex or plano-convex, becoming expanded and then obtusely umbonate, 'Ochraceous Buff' at the centre, fading to 'Cream Color' or 'Cream-Buff' towards the margin, subhygrophanous, smooth, glabrous; margin always remaining incurved. *Lamellae* white to pale cream, sinuate, crowded, up to 5 mm in width; edge entire. *Stipe* 4–7 cm × 4–7 mm, equal with a clavate bulbous base at maturity, white at first becoming concolorous with the pileus, smooth, fibrous fleshy. *Context* very thin, not more than 3–4 mm in thickness; consisting of loosely interwoven hyphae, 2.5–10.5 μ diam., hyaline, septate, broadly inflated. *Spores* 7.5–10 × 4.5–5.5 (8.4 × 4.7) μ ellipsoid to ellipsoid-oblong, hyaline, thin-walled, ornamented by a coarsely warted, strongly amyloid exosporium, the warts forming a type-VI ornamentation (verrucose without anastomes or ridges), prominent apiculus and smooth suprahilar plage. *Spore print* pure white. *Basidia* 25–32 × 7–8 μ, claviform, bearing 4 sterigmata, 2.5–4 μ long. *Pleurocystidia* present, 34–48 × 4.5–7.5 μ, leptocystidioid, thin-walled, hyaline, varying in shape from subulate to lageniform with a long narrow neck, pointed at the apex; always a transverse septum at the base of the neck, no apical incrustations observed; not abundant. *Cheilocystidia* similar to the pleurocystidia but very rare and often absent. *Hymenophoral trama* up to 110 μ wide, strictly regular, except for a very narrow, interwoven mediostratum which disappears in the lower part of the gill; consisting of narrow, hyaline, thin-walled hyphae, 1.5–4.5 μ diam. Subhymenial layer subcellular, 11–17 μ wide. *Pileus-surface* a cutis, of repent, loosely interwoven, hyaline hyphae, 3–8 μ diam., septate, branched, not showing any radial arrangement. All hyphae inamyloid, devoid of clamp-connexions.

On lawn. Makerere University College, Uganda. Alt. 4,100 ft. 21 April 1964. Legit *E. A. Calder*, no. *69* (Type).

The pale cream colours of the pileus and stipe, together with the narrow lamellae, would indicate that this species belongs in the section *Alboflavidae* Sing. of the genus *Melanoleuca* Pat. The overall macroscopic appearance and habit closely approaches that of the European species, *M. strictipes* (Karst.) J. Schaeff. However, the cystidia of *M. strictipes* are lageniform with an obtuse apex to the neck, which is generally covered by a crystalline incrustation, and quite different from those of *M. tropicalis*. The fine, urticoid structure of the cystidia suggest that the intrageneric relationship for this species might be sought in the section *Oreinae* Sing., close to *M. exscissa* (Fr.) Sing. *Melanoleuca exscissa* differs in the darker pigmented pileus, the shorter stipe, the absence of pleurocystidia, and slightly broader spores.

RESUPINATUS APPLICATUS (Batsch ex Fr.) S. F. Gray

See *Pleurotus palmicola*, p. 97.

Xerulina deseynesiana Pegler, *nom. nov.*—Text-figs. 137–141

Clitocybe verruculosa De Seynes, Recherches Hist. nat. Fl. Champ. Congo français **I**: 7, pl. 3, figs. 8–10. 1897; not *Xerulina verruculosa* (Sing.) Sing. *in* Sydowia **15**: 59. 1961.

Pileus 10–25 mm diam., hemispherical to convex becoming expanded at maturity, either broadly umbonate or depressed at the centre, 'Cream Color' to 'Warm Buff', beset with an extensive covering of minute, brown, innate, furfuraceous scales which are sparse towards the margin but coalescent at the centre to produce a 'Chestnut-Brown' disc; margin straight, undulate, entire. *Lamellae* sinuato-adnexed, subventricose, cream to pallid, drying 'Ochraceous-Buff', moderately crowded with lamellulae; edge *sub lente* pruinose. *Stipe* 1.5–2.5 cm × 1–2 mm, equal, cylindric, hollow, concolorous with the pileus, umbrinous towards the base, smooth, arising from a white mycelial, bulbillose base. *Context* comparatively thick, concolorous, inamyloid. *Spores* 3.5–5.8 × 2–3.2 (4.5 × 2.5) μ, oblong-ellipsoid to ellipsoid, hyaline, thin-walled, smooth, inamyloid. *Spore print* pure white. *Basidia* 14–17.5 × 4–5 μ, claviform to subcylindric, bearing 4 sterigmata (up to 4 μ long). *Cheilocystidia* 23–28 × 3–3.5 μ (at base), narrow lageniform, swelling slightly towards the apex, hyaline, thin-walled, smooth, with dense cytoplasmic contents; fairly abundant, intermixed with the basidia, and projecting beyond the hymenium for up to 20 μ. *Pleurocystidia* absent. *Hymenophoral trama* hyaline, regular or nearly so, consisting of thin-walled, hyaline, septate hyphae, inflated up to 8 μ diam. Subhymenial layer well developed, up to 12 μ wide, subcellular. *Pileus-surface* a trichodermial palisade, becoming much fragmented at an early stage. The elements are subglobose to piriform, becoming short cylindric and irregular, 9–20 μ diam.; wall slightly thickened, brown pigmented, and smooth; forming short irregular chains. *Caulocystidia* absent. All hyphae provided with clamp-connexions.

Amongst forest litter, associated with roots. Mpanga 69, Makerere University College, Uganda. Alt. 4,300 ft. 13 April 1964. Legit *E. A. Calder*, no. *40*.

De Seynes (1897) described an agaric from Diélé (Moyen Congo) which he named *Clitocybe verruculosa*. The description and figure were apparently based upon immature material, and the lack of any spore development world support this view. However, the excellence of his accompanying illustrations, particularly those of the micro-characters which include the cystidia and pileus-surface structures, can leave little doubt that the above material from Uganda constitutes the same species.

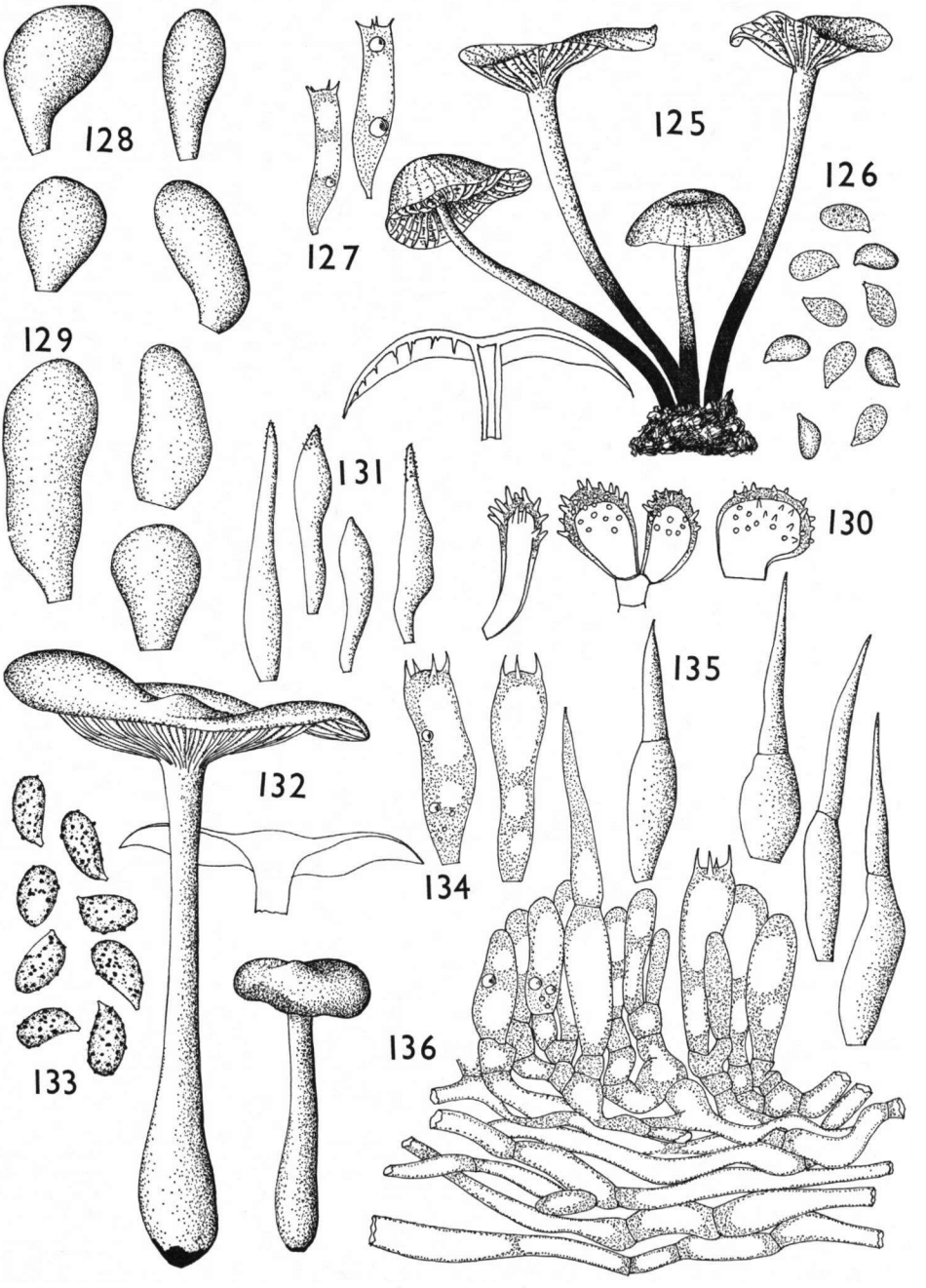
Singer (1953) described *Xerula verruculosa* from the Argentine, subsequently transferring it to his own genus *Xerulina* (1961). He suggested that the species described by De Seynes might be the same, but did not include it in synonymy. It has now become clear from examination of recently collected, fertile material of the tropical African fungus, that it is quite different from the species described by Singer.

EXPLANATION OF FIGURES 125–136

Figs. 125–129. *Marasmius favoloides*. — 125. Habit of sporophore and section (× 1). — 126. Spores. — 127. Basidia. — 128. Epithelial elements. — 129. Caulocystidia.

Figs. 130, 131. *Marasmius kroumirensis*. — 130. Cheilocystidia. — 131. Pleurocystidia.

Figs. 132–136. *Melanoleuca tropicalis*. — 132. Habit of sporophore (× 1). — 133. Spores. — 134. Basidia. — 135. Pleurocystidia. — 136. Hymenium. (All × 1000 unless otherwise stated.)



Figs. 125—136

As the combination *Xerulina verruculosa* is already preoccupied, it therefore becomes necessary to provide a new name.

The vesiculose cheilocystidia, and the very much larger and differently shaped spores, 6.8–8.3 × 5.5–6.8 μ, readily distinguish *X. verruculosa*. *Xerulina deseynesiana* differs from the other species of *Xerulina*, by the minute spores.

XERULINA LACHNOCEPHALA (Pat.) Sing.—Text-figs. 142–146

Xerulina lachnocephala (Pat.) Sing. *in* Sydowia **15**: 59. 1961.

Pileus 20–30 mm diam., convex becoming expanded, ochraceous, surface broken up to form numerous, minute, pyramidal, granular or furfuraceous scales which extend to the margin; margin straight, entire. *Lamellae* adnate to subdecurrent, pallid, moderately crowded with numerous lamellulae and slight interveining; edge entire. *Stipe* 5 cm × 3 mm, expanding towards the apex, cylindric, hollow, concolorous with the pileus, with a loose velvety-tomentose covering. *Context* thin, hyaline, inamyloid. *Spores* 6–8.3 × 4.5–5.7 (7.2 × 4.9) μ, broadly ellipsoid to limoniform, hyaline or slightly stramineous, thin-walled, smooth, inamyloid, with numerous granular contents. *Basidia* 21–26 × 4.5–5.5 μ, claviform, bearing 4 sterigmata. *Cheilocystidia* absent. *Pleurocystidia* few, 27–45 × 9.5–11.5 μ, broadly cylindric to fusiform, hyaline, thin-walled, projecting. *Hymenophoral trama* hyaline, regular or nearly so, consisting of thin-walled hyphae, 1.7–4 μ diam., inflated up to 7 μ. Subhymenial layer subcellular. *Pileus-surface* a trichodermial palisade, much fragmented, consisting of chains of elongate elements, frequently branched at the septa; individual elements 14–40 (–60) × 3.5–11.5 μ, oblong cylindric, with very thick (–4 μ), yellowish-brown walls, and a constricted lumen; terminal elements variable, claviform to lanceolate, sometimes with a nodulose apex. The trichodermium forms a layer up to 140 μ thick. All hyphae provided with clamp-connexions.

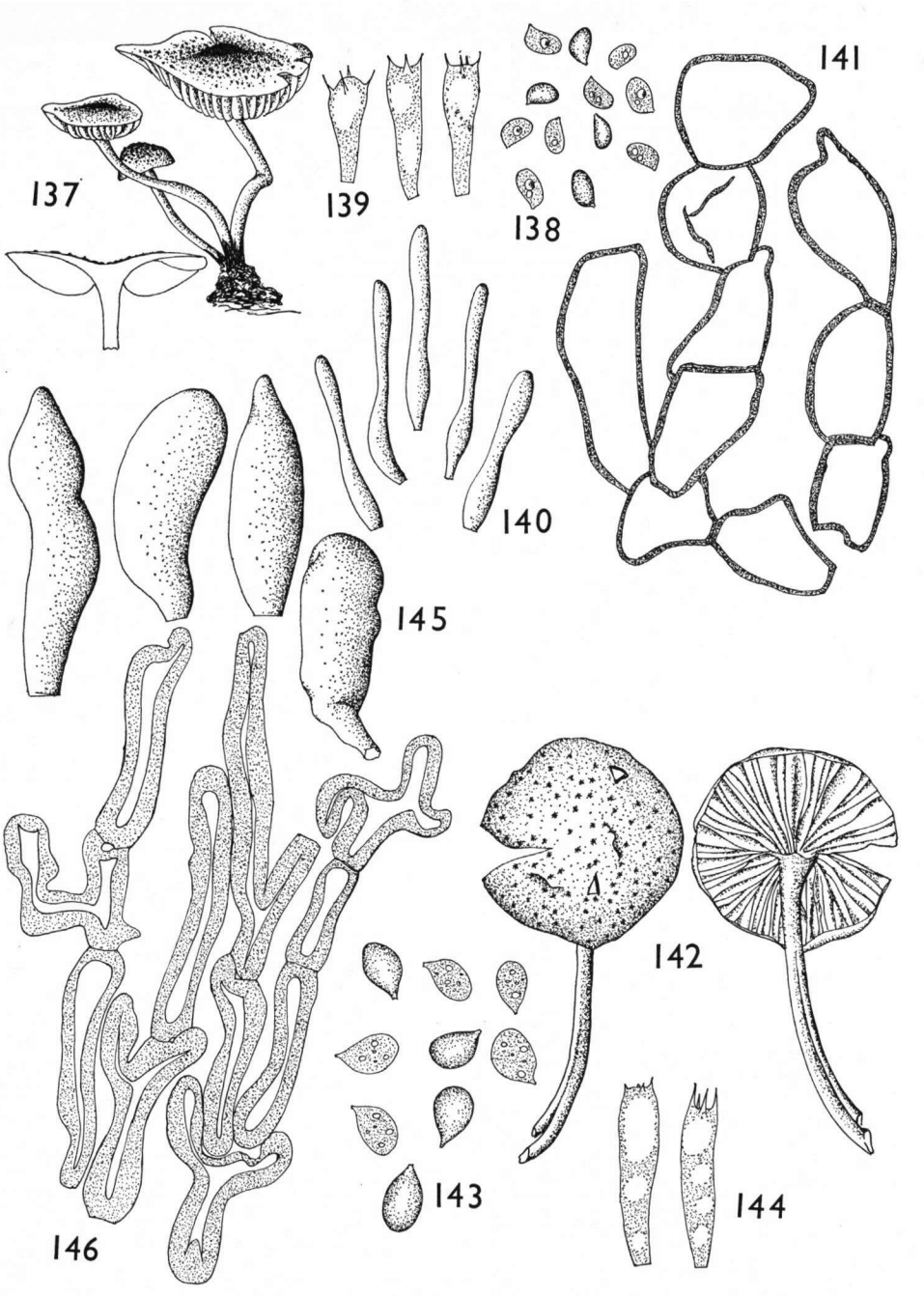
On the ground (?). Missango, Ubangi, Congo. 1891. Legit *M. J. Dybowski* (FH, type).

Patouillard (1902) made no mention of spores when he first described this species as a *Collybia*, but examination of the type specimen by the present author has revealed numerous spores, though many are in a collapsed condition. Singer (1964) indicated that *X. lachnocephala* is very closely related to the tropical American species, *X. chrysopepla* (Berk. & Curt.) Sing., but the former species may be separated on the colour of the sporophore, the smaller and differently shaped spores, and the elements of the trichodermium.

EXPLANATION OF FIGURES 137–146

Figs. 137–141. *Xerulina deseynesiana*. — 137. Habit of sporophore and section (× 1). — 138. Spores. — 139. Basidia. — 140. Cheilocystidia. — 141. Trichodermial elements.

Figs. 142–146. *Xerulina lachnocephala*. — 142. Sketch of type specimen (× 1). — 143. Spores. — 144. Basidia. — 145. Pleurocystidia. — 146. Trichodermial elements. (All × 1000 unless otherwise stated.)



Figs. 137—146

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