

AGARICALES OF WEST BENGAL—III

By

A. ROY AND N. SAMAJPATI

Mushroom Research Centre,

Mycology (Basic and Applied) Laboratory,

Department of Botany, Calcutta University,

Calcutta 700019

This paper reports one new species of *Lactocollybia*, two new species of *Leucocoprinus* and four new species of *Lepiota* from India and one species of *Leucocoprinus* from West Bengal.

INTRODUCTION

In a survey of the Agaric flora of West Bengal, during last monsoon, several collections were made that comprises of different genera with several undescribed species for India and one undescribed species for West Bengal.

MATERIALS AND METHODS

Observations were made on free hand vertical sections mounted either directly on Melzer's iodine or in 1% aniline blue in 50% Lactic Acid after an initial soaking in 10% KOH solution. All descriptions are based on the observations on fresh material. Colour Terminology used according to the Royal Botanic garden Edinburgh colour identification chart for 'Flora of British Fungi'. All materials are preserved in dry condition, in the Mycology Herbarium, Botany Department, University of Calcutta, Calcutta 700019.

ENUMERATION OF THE SPECIES

Lactocollybia angiospermarum Singer.

Collybia cycadicola Foss., sensa Demis.

Pileus : 5-20 mm in diameter, convex to hemispheric then expanded, sometimes umbonate often slightly depressed at the centre, cuticle white colour hygrophanous, surface smooth, fleshy tough, margin short, transparent striae present, involute regular.

Lamellae mostly decurrently arranged, edge paler, white with numerous lamellulae of 3 lengths. *Stipe* : 20-40 mm $\times$ 2-4 mm; central, equal, cylindric, hollow, long, slender, dry finely promiose, glabrescent, originating from tuft of white mycelial base. *Spore Print* : white.

Spores : 8.06-10.4 μm $\times$ 5.3-9.1 μm (9.1 $\times$ 7.00) μm ; $Q=1.4$; elongate, ellipsoid, amygdaliform, hyaline, imamyloid, containing one to several refractive oil-guttules.

Basidia : 15.6-20.8 μm $\times$ 5.2-7.7 μm (19.7 $\times$ 6.4) μm ; clavate, tetrasporous;

Cheilocystidia numerous, hyaline with few contents, thin walled, cylindric-clavate with a sub-capitate apex (5.2-7.8 μm in diam.) forming a sterile gill edge; *gleocystidia* numerous present all along the lamellar surface, 28.6 μm -36.4 μm $\times$ 7.8 μm -10.4 μm ; projecting 7.8 μm -13 μm beyond the basidial layer; tramal in origin; various shaped, normally clavate to fusiform, sometimes with subcapitate apex and forming a part of the gloeo-system.

Hymenophoral Trama regular, homiomorous with parallel, short, thin walled, segmented hyphae, 7.8-10.4 μm in diam., hyaline and inamyloid. *Subhymenium* little developed, cellular. Pileal surface is an unpigmented epicutis, made up of densely interwoven, long, filamentous hyphae (18.2-26 μm thick), finely granulated, surface incrustated. *Pleurocystidia* absent; *Gloeocystidia* emerginate in the pileal surface, latex absent. *Caulocystidia* abundant 39-57.6 μm $\times$ 15.6-18.2 μm , cylindric to clavate, hyaline, thin walled with few contents.

Gloeosystem present in the context. Cutis and stipe constitute extensive but discontinuous short segmented hyphae ($57.2-107.4 \times 10.4-15.6$) μm ; All hyphae with inconspicuous clamp connections.

Distribution

India : West Bengal; Science Collage Compound, Calcutta, on sandy soil

Roy and Samajpati, July 1978; M. H No. 17/78.

Leucocoprinus zeylanicus (Berk) Boedijn.

Lepiota zeylanica (Berk) Sacc.

L. inebriata (Berk & Br.) Sacc.

L. rubricata (Berk & Br.) Sacc.

Agaricus zeylanicus Berk.

A. inebriatus Berk & Br.

A. theloides Berk & Br.

A. rubricatus Berk & Br.

Pileus 20-90 mm in diam., at first campanulate to conical then expanding to plano convexed with a prominent central umbo; surface white to pale brownish with maturity, more deeply reddish brown pigment present at the umbo; finely radially striate, beset with sparsely arranged, minute reddish brown squammules. Margin entire, fleshy, sulcate, striate, sometimes fissured.

Lamellae free to adnexed, at first white, finally reddening on bruishing or drying or decaying, moderately crowded; edge denticulate. *Stipe* 70-140 mm $\times$ 20-35 mm; central, long, cylindric, equal, fleshy, hollow, surface white at first but finally reddening on bruishing or exposing to air, glabrous, silky, striate; with a slight swollen base, arising from tuft of white basal mycelium. Annulus persistent, narrow, membranous, whitish with pinkish tint, strongly attached to the upper third of the stipe but become movable with maturity. *Spore print* : white.

Spore $7.8-10.4 \mu\text{m} \times 5.2-6.5 \mu\text{m}$ ($8.7 \mu\text{m} \times 5.8 \mu\text{m}$); $Q = 1.3$; ellipsoid, with small apical germ pore not truncate; hyaline with a compound wall, strongly dextrinoid. *Basidia* : $13-15.6 \mu\text{m} \times 6.5-7.8 \mu\text{m}$ ($15.1 \times 7.07 \mu\text{m}$); clavate,

tetrasporous. *Cheilocystidia* numerous, forming a sterile gill edge; narrowly clavate to cylindric, with an obtuse apex $26-31.2 \mu\text{m} \times 7.8-13 \mu\text{m}$; thin walled, hyaline; tramal in origin; *Pleurocystidia* absent. *Hymenophoral trama* broad, intermixed, homiomorous with long filamentous cells, $7.8-10.4 \mu\text{m}$ in diameter. Pileal surface a repent epicutis of radially arranged with walled filamentous hyphae $5.2-7.8 \mu\text{m}$ in diameter. All hyphae without clamp connections.

Distribution

India : On the ground, Indian Botanic Gardens, Howrah, West Bengal. Roy and Samajpati, July 1978 ; M. H. No. 25/77.

Leucocoprinus birnbaumii (Corda) Singer.

Agaricus birnbaumii Corda.

A. cepaestipes Sow ex Fr. var. *flos-sulphuris* (Schnizlein) Oudemans,

A. flos-sulphuris Schnizlein.

A. luteus (Bolt ex Secr.) Berk.

A. cepaestipes Sow ex. Fr. var. *lutea* Bolt, ex. Secr.

Lepiota flammula (Alb & Schw.) Gillet.

Lepiota lutea (Bolt ex Secr.) Goldfrin.

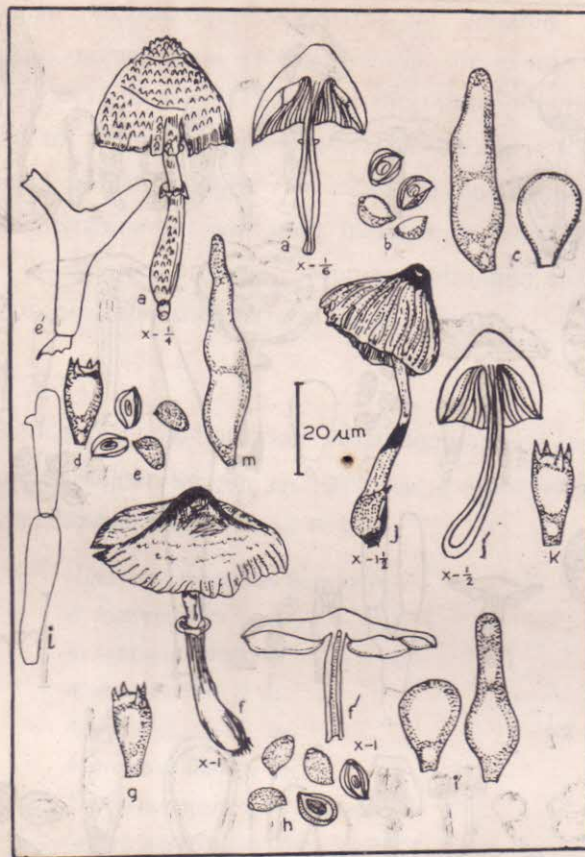
L. pseudoliomophora Rea

L. aurea Mass.

Leucocoprinus flos-sulphuris (Schnizlein) Cejp.

L. luteus (Bolt ex Secr.) Locq.

Pileus 32-42 mm in diam.; ovoid to pendulus then conical, finally flattened with truncate apex at maturity. surface greenish yellow to picric yellow covered with loosely scattered floccose squammules, same to pileus colour; closely plicatestriate half way to the disk; undulate margin. fleshy and smooth. *Lamellae* free, sulphur yellow, moderately crowded, broad, thin, equal in length. *Stipe* 50-60 mm $\times$ 8-10 mm, central, long, cylindric with a swollen base (6-10 mm in diam.) hollow, surface concolours with the pileus; base remain solid with maturity, ended with fine, tufts of pseudorhizoids. *Annulus* very thin, membranous, fragmentary, attached to the upper part of the stipe., context thin, fleshy, soft, concolours with the pileus. *Spore print* : yellowish. *Spores* : $7.3-10.4 \mu\text{m} \times 5.2-6.5 \mu\text{m}$ (8.72×5.65) μm ; $Q = 1.51$; ovoid to ellipsoid, truncated



Text Fig. 1 : (*Leucocoprinus cepaestipes* (Sowex Fr.) Pat.) a & a' Habit and Section; b Spore. c Cheilocystidia. d Basidia e' Epidermal elements.

Text Fig. 1: (*L. zeylonicus* (Berk) Boedijn) f & f' Habit Section. g Basidia. h Spore i Cheilocystidia.

Text Fig. 1 : *L. birnbaumii* (Corda) Sniger i & j' Habit and Section., k Basidia. l Spore. m Cheilocystidia. n Epidermal elements. b Basidia; c Spore; d Cheilocystidia; d1 Hymenial gloeocystidia; d2 Caulocystidia; e Elements of gloeosystem.



Text Fig. 2 : *Lactocollybia angiospermarum* Singer. a & a', Habit and Section.
b Basidia. c Spore d Cheiloecystidia. d₁ Hymenial gloeocystidia
d₂ Caulocystidia. e Elements of gleosystem.

Text Fig. 2 : *Lepiota apala* Chroa (Berk & Br.) Soce. a' & a', Habit and Section;
b' Basidia; c' Spore; d' Epidermal elements.

Text Fig. 2 : *L. leprica* e' Habit and Section; f Basidia; g Spore;
h Cheilocystidia; i Epidermal elements.

Text Fig. 2 : *L. lepidophora* j' & j', Habit and Section; k Basidia; l Spore
m Cheilocystidia; n Epidermal elements.

Text Fig. 2 : *L. erythroyramema* o & o, Habit and Section; p Basidia q Spore,
r Cheilocystidia, s Epidermal elements.

apex by a small but distinct germ pore; hyaline to yellowish tinged, strongly dextrinoid. *Basidia* 18.2-20.8 μm $\times$ 7.8-10.4 μm ; inflated, clavate, strongly curved sterigmata, tetrasporous. *Cheilocystidia* numerous forming a setrile lamella edge; cheilocystidia are of 2 types; a) short inflated pyriform 13-26 μm $\times$ 7.8-15.6 μm and b) elongate, lageniform 28.6-39 μm $\times$ 13-15 μm , all are hyaline, thin walled, tramal in origin; *Pleurocystidia* not found. *Hymenophoral trama* intermixed, homiomorous with long, filamentous cells 5.2-10.4 μm in diam. Pileal surface an ill defined epicutis of loosely arranged, branching chains of elements which become disrupted to form loose floccules.

Distribution :

India : Santoshpur, 24-Parganas West Bengal; on decayed herbs; Roy and Samajpati September 1978; M. H. No 65/78.

Leucocoprinus cepaestipes (Sow ex Fr.) Pat.

Agaricus cepaestipes Sow ex Fr.

A. rorulentus Panizzi.

A. continuus Berk.

A. adoneus Berk & Br.

A. cenopus, Aerk & Br.

A. oncopus Berk & Br.

A. cheimoniceps Berk & Curt.

Lepiota cepaestipes (Sow ex Fr.) Kummer.

L. cheimoniceps (Berk & Curt) Sacc.

L. adonea (Berk & Br.) Sacc.

L. continuus (Berk & Br.) Sacc.

Lepiota cenopus (Berk & Br.) Sacc.

L. oncopus (Berk & Br.) Sacc.

L. rorulenta (Panizzi) Barla.

Mastocephalus cepaestipes (Sow ex Fr.) Kuntze.

Hiatula cepaestipes (Sow ex Fr.) Hein & Morgan.

Pileus : 10-45 mm in diam., at first bell shaped then conical, finally campanulate to flattened, obtusely umbonate surface pure milky white, lustrous cream or buff brown coloured at the disk with maturity; covered by loose granular furfuraceous white squammules which are sometimes removed by weathering;

margin thin wavy, plicate-striate, rarely fissured; *Lamellae* adnexed to free, white, thin, upto 5-7 mm wide, crowded, edge concolours, pruinose. *Stipe* : 30-90 mm $\times$ 8-10 mm; thin, central, long, cylindric, equal above, with a prominent swollen base (5-8 mm in diam.); surface white covered by granular loosely arranged furfuraceous white squammules more concentrated at the base; with a thin, membranous delicate annulus attached to the mid way zone of the stipe. Context thin, whitish, soft. *Spore print* : white.

Spores : 7.8-10.4 μm $\times$ 5.2-7.8 μm (9.02 $\times$ 6.17) μm ; Q=1.4. short, ovoid, with a small but distinct germ pore with truncate apex, hyaline with a compound wall, strongly dextrinoid.

Basidia : 15.6-18.2 μm $\times$ 9.1-10.4 μm (16.5 $\times$ 9.7) μm ; inflated clavate, tetrasporous, *Cheilocystidia* numerous, forming a sterile gilledge, variable in shape clavate to mucronate; very rarely constricted; *Pleurocystidia* absent; *Hymenophoral trama* intermixed, subregular to irregular; homiomorous with thin walled filamentous hyphae 7.8-10.4 μm in diam. Pileal surface an epicutis, formed by loosely arranged chains of hyaline, thin walled hyphae 26-52 μm 5.2-26 μm sometimes forming erect, loose fascicles. All hyphae without clamp connections.

Distribution

India : Baroda (Mosses 1948); Botanic Garden, Saharanpur, U. P.; Poona, Bombay (Butler and Bisby, 1960), Calcutta (Bose, 1920; Banerjee, 1947; Roy and Samajpati, 1975); M. H. No. 31/78; 38/78.

Lepiota apalochroa (Berk & Br.) Sacc.

Agaricus apalochrous Berk & Br.

Pileus 13-23 mm in diam., spherical to widely flattened, membranous, retaining a central umbo, surface white to cream coloured, covered with minute reddish brown squammules in a circular fashion, more concentrated at the central umbo region, absent at the margin. Margin thin, wavy, incurved, sulcate, striate. *Lamellae* free, forming a circular zone at the under surface of the pileus and at the point of stipe and pileus juncture, on which gill ends meet; close, arcuate, white, narrow, lamellulae of 2 lengths upto

2 mm wide. *Stipe* 13-24 mm $\times$ 2-4 mm; cylindric equal, central, thin hollow with a narrow lumen, surface white, smooth, fibrillose with root base. Annulus membranous, ascendant, white, attached to the midway zone of the stipe. Context white, thin upto 2-3 mm thick at the disk, almost absent over the lamellae. *Spore print*: white. *Spores*: 7.28-9.1 μm $\times$ 5.2-7.8 μm (7.4-6.3) μm ; $Q = 1.5$; ellipsoid, subamygdaliform to amygdaliform, hyaline, thin walled, dextrinoid. *Basidia* 13-15.6 μm $\times$ 5.2-10.4 μm ; clavate, tetrasporous. cheilocystidia absent, pleurocystidia absent, *Hymenophoral trama* sub-regular to irregular, homiomorous with thin walled filamentous cells 5.2-7.8 μm in diam. Pileal surface a disrupted epithelium of pyriform elements, variable in size 13-36.4 μm — 7.8-15.6 μm , thin walled hyaline, and containing a brown vacular pigment. All hyphae bear clamp connection.

Distribution

Indian : Pratappur, Midnapore, West Bengal; on compost soil; Roy & Samajpati July 1978; M. H. No. 61/78.

Lepiota leprica (Berk & Br.) Sacc.

Agaricus lepricus Berk & Br.

Pileus : 30-90 mm in diam., convex to hemispheric then widely flattened with a central obtuse umbo; surface covered by numerous minute reddish brown, erect, pyramidal squammules crowded at the disk; more or less concentrically arranged on pale white cuticle; central umbo, deep reddish brown pigmented; margin fibrillose regular, fleshy, thick, transparent striae present. *Lamellae* free, white, moderately crowded, coarse, regular, margin smooth. *Stipe* : 60-114 mm $\times$ 20-40 mm, central, equal, cylindric slightly swollen at the base, originating from tuff of white mycelium (Pseudorrhiza like bodies); surface concolours with pileus, covered by reddish brown repent squammules below the annulus, paler above; annulus evanescent, dark reddish brown, hard, strongly adpressed to the upper quarter of the stipe. Context white upto 2-5 mm thick at the disk. *Spore print* : Pure white. *Spores* : 7.8-10.4 μm $\times$ 3.9-6.5 μm (8.4 $\times$ 4.2) μm ; $Q \times 1.8$; ellipsoid, hyaline, thin walled, dextrinoid, suprahillar depression absent.

Basidia : $15.6-31.2 \mu\text{m} \times 7.8-15 \mu\text{m}$ (25.5×10.4) μm ; broadly clavate, tetrasporous. *Cheilocystidia* numerous, forming a sterile gill edge, variable in shape, pyriform to inflated, often clavate with a short base, thin walled. $15.6-26 \mu\text{m} \times 7.8-10.4 \mu\text{m}$. *Pleurocystidia* absent. *Hymenophoral trama* regular, to sub-regular, homiomorous, with thin walled filamentous hyphae $10.9-15.6 \mu\text{m}$ in diam. Subhymenium well developed, cellular, $7.8-10.4 \mu\text{m}$ in depth. Pileal surface in a disrupted trichodermium constitute loose erect fascicles of thin walled hyphae terminally inflated into large clavate heads. $11.7-15.6 \mu\text{m}$ in diam.

Distribution

India : Gurusaday Road (Calcutta, West Bengal); on soil, Roy & Samajpati June, 1978; M. H. No. 19/78.

Lepiota lepidophora (Berk & Br.) Sacc.

Agaricus lepidophorus Berk & Br.

Pileus 10-20 mm in diameter, campanulate to plane with a shallow central umbo, cuticle milky white, surface covered by numerous, minute dark brown squammules, strongly adpressed on the cuticular surface; central umbo dark brown spotted, sulcate striate on drying; margin entire straight often upcurved; sometimes undulate. *Lamellae* free, white at first finally becoming lemon yellow on maturity, narrow; slightly expanded at the base hollow; surface white, smooth glabrous; with an entire membranous thin whitish annulus attached to the upper quarter of the stipe.

Spore print : white. *Spores* $4-6.5 \mu\text{m} \times 2.6-3.9 \mu\text{m}$ (5.2×3.2) μm ; $Q = 1.3$; ellipsoid, hyaline, thin walled, dextrinoid, slightly apiculated. *Basidia* $10.4-11.7 \mu\text{m} \times 3.9-5.2 \mu\text{m}$ (10.7×4.2) μm ; clavate, tetrasporous. *Cheilocystidia*, over crowded at the lamellar edge $10.4-15.6 \mu\text{m} \times 7.8-8.32 \mu\text{m}$, pyriform but mostly collapsed, thin walled, hyaline. *Pleurocystidia* absent. Pileal surface a disrupted trichodermium consisting of loosely arranged fascicles of chains of cylindric elements with inconspicuous clamp connectios at the septa, fairly thin walled.

Distribution

India : Science College Compound, Calcutta, West Bengal; on soil, Roy & Samajpati June 1978; M. H. No. 16/78.

Lepiota erythrogramma (Berk & Br.) Sacc.

Agaricus erythrogrammus Berk & Br.

A. alborusseus Berk & Br.

Lepiota alborussæa (Berk & Br.) Sacc.

Pileus : 20-80 mm in diam, convex to conicocampanulate then flattened to a plane with low umbo at the centre; surface deep reddish purple, much deeper at the centre. fleshy, smooth, radially fibrillose to rimose, margin entire, fleshy and thin. *Lamellae* free, milky white, ventricose, moderately crowded, edge denticulate. *Stipe* : 49-70 mm × 10-15 mm; central, cylindric with a slight bulbous base, fistulose, surface smooth, white, shiny. Annulus persistent, membranous, ascendent white attached to the upper quarter of the stipe. *Spore print* : Pure white. *Spores* : $6.5-7.8 \mu\text{m} \times 3.9-5.2 \mu\text{m}$ ($6.9 \times 4.3 \mu\text{m}$); $Q = 1.6$; amygdaliform with an attenuated apex, hyaline, thin walled, dextrinoid. *Basidia* $13-18.2 \mu\text{m} \times 5.72-10.4 \mu\text{m}$ ($16.64 \times 8.94 \mu\text{m}$); clavate, tetrasterigmatic. *Cheilocystidia* numerous, forming a heteromorphous sterile gill edge; $20.8-31.2 \mu\text{m} \times 7.8-10.4 \mu\text{m}$; clavate, cylindric with a narrow base; thin walled. Tramal in origin; *Pleurocystidia* absent; *Hymenophoral trama* irregular, constitute strongly interwoven hyphae; homiomeric. Pileal surface a cutis of repent parallel hyphae comprising of unbranched chains of elongated cylindric elements; elements thin walled differentiated with acute to sub-obtuse apices.

Distribution

India : Race Course Maidan, Calcutta, West Bengal. on composted soil, Roy & Samajpati. July 1978 : M.

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