

## Taxonomic Studies of Indian Myxomycetes — XIX.

### Some rare Myxomycetes from Simla

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**Abstract.** Six rare corticolous myxomycetes are recorded and described for the first time from India. These are *Licea operculata*, *Echinostelium cribrarioides*, *Cribraria pachydictyon*, *Arcyria nigella*, *Hemitrichia leotricha* and *Comatricha nodulifera*. In addition, a note on *Cribraria splendens* collected in nature, has also been included.

This communication is in continuation with the exploration studies on Indian myxomycetes started by the first author. In the present studies myxomycetes were collected from Simla and some adjoining areas during August–September 1977 and some were also isolated from the bark of living trees placed in the moist chambers (GILBERT & MARTIN, 1933).

A review of the literature reveals that so far nine species of *Licea*, one of *Echinostelium*, and twelve of *Cribraria*, fifteen of *Arcyria*, five of *Hemitrichia* and twelve of *Comatricha* have been recorded from India.

All the specimens have been preserved in the Herbarium of Department of Bio-Sciences, H. P. University, Simla, India.

1. *Licea operculata* (WINGATE) MARTIN, Mycologia 34: 702. 1942. — Figs. 1, 2

Fructifications sporangiate, stipitate, 0.5–1 mm in total length. Sporangia erect, solitary, scattered, brown to black, 0.1–0.3 mm in diameter, urniform, operculum sharply distinguishable as light coloured, spherical structure; peridium membranous, yellowish brown, granular, dehiscence operculate; spores dull yellow, paler by transmitted light, globose, smooth, 10–13  $\mu$ m in diameter, paler on one side; stipe 0.5–0.8 mm in length, stout, smooth, tubular, opaque, granular; hypothallus inconspicuous.

**Habitat.** — Isolated in a moist chamber from the bark of *Cedrus deodara*.

**Specimens examined.** — H. P., Simla, 13. 4. 1977, TNL/RS 810.

**Discussion.** — The species has been isolated from the bark of *Cedrus deodara* placed in the moist chambers. The Simla populations are characterised by stalked urniform and operculate sporangia,

reaching up to 1 mm in total length. The spore size (10—13  $\mu\text{m}$ ) is, however, larger than that reported for the species and is in the range of *L. pedicellata* (GILBERT) GILBERT. *L. pedicellata*, however, lacks an operculum, is smaller in size and its peridium is composed of obscure platelets.

2. *Cribraria splendens* (SCHRAD.) PERS., Syn. Fung. 191. 1801. — Figs. 8—10

Fructification sporangiate, stipitate, up to 2 mm in total length. Sporangia scattered or in loose groups, erect or nodding, globose, 0.4—0.6 mm in diameter, ochraceous yellow; peridium evanescent; calyculus absent, or present during early stages, later completely replaced by 10—15 flat ribs, free or partially connected by a thin membrane at base, bearing the peridial net above; nodes small, irregularly thickened, pulvinate in upper part of the net, elongate in basal portion; spores dusty brown, colourless by transmitted light, smooth, globose 6—6.5  $\mu\text{m}$  in diameter; stalk up to 1.5 mm in length, cylindrical, smooth, opaque, reddish brown.

Habitat. — Dead wood.

Specimens examined. — H. P., Simla, Narkanda, 17. 8. 1978, TNL/RS 811.

Discussion. — *Cribraria splendens* (SCHRAD.) PERS. is a very characteristic species in which the calyculus is generally replaced by 8—15 firm and distinct ribs which radiate from the stipe and support the net. The species has been reported in India only from Orissa (GHOSH & DUTTA, 1962) in the proceedings of 49th Indian Science Congress and was not described yet in detail. Simla specimens are quite typical of the species.

3. *Echinostelium cribrarioides* ALEXOP., Midl. Nat. 66: 391. 1961. — Figs. 3, 4

Fructifications sporangiate, stipitate up to 390  $\mu\text{m}$ . Sporangia solitary scattered, erect, globose, absent 0.15 mm in diameter, ochraceous or pale brown; peridium fugaceous leaving a persistent collar at the sporangial base; columella well developed, brownish black, with homogeneous contents, divided into 3—4 main branches which by further division form a dense net with regular meshes; capillitium threads concolorous with columella but paler towards apices; spores brown, paler by transmitted light, often persisting inside the capillitial net as spore ball, globose 9—10  $\mu\text{m}$  in diameter, smooth, marked with almost evenly distributed thickened areas, characteristic of the genus; stipe tubular, smooth, subulate, expanded below and filled with granular matter, darker towards base; hypothallus rotate, membranous, yellow transparent. Protoplasmodium colourless.

Habitat. — On bark of *Rhododendron*, kept in moist chamber.

Specimens examined. — H. P., Simla, 5. 9. 78, TNL/RS 813.

Discussion. — The species is characterised by the well developed globose capillitium net which holds a spore ball inside, and in addition columella and capillitium have a different aspect from that of the stipe.

In our specimens the columella is apically divided into three to four branches which (by further division) produce a much more developed net than reported for the species earlier.

4. *Cribraria pachydictyon* NANN.-BREM., K. Ned. Acad. Wet. Proc. C. 69: 342. 1966. — Figs. 5—7

Fructification sporangiate, stipitate, up to 1.5 mm in length. Sporangia erect, solitary and scattered, yellowish brown with red tints, about 0.2 mm in diameter; peridium thin, membranous early fugaceous; calyculus small and inconspicuous or absent, the peridial net thin, borne directly on the stipe; peridial net reticulate, nodes and internodes beginning from near the stipe apex even when calyculus visible, nodes numerous, pulvinate, 9—13  $\mu$ m wide, variable in length; studded with dictydine granules, which measure 2—2.5  $\mu$ m, meshes mostly triangular, pale or dark, depending upon the compactness of dictydine granules, 5—6 internodes given off from each node, threads stout, free ends absent; spores reddish brown, pale ochraceous by transmitted light, globose, 7.5—8  $\mu$ m diameter, minutely spinulose; stipe up to 1.2 mm, i. e. about 6—7 times the diameter of the sporangium, longitudinally rugose, reddish brown, shining against light, with

#### Legends to Figures

Figs. 1, 2: *Licea operculata* (WINGATE) MARTIN. — 1. Three sporangia showing operculate dehiscence,  $\times 35$ . — 2. Smooth spores with hyaline area on one side,  $\times 1200$

Figs. 3, 4: *Echinostelium cribrarioides* ALEXOP. — 3. Sporangium with stuffed stalk and globose peridial net,  $\times 200$ . — 4. Smooth spores bearing equidistant marks,  $\times 1500$

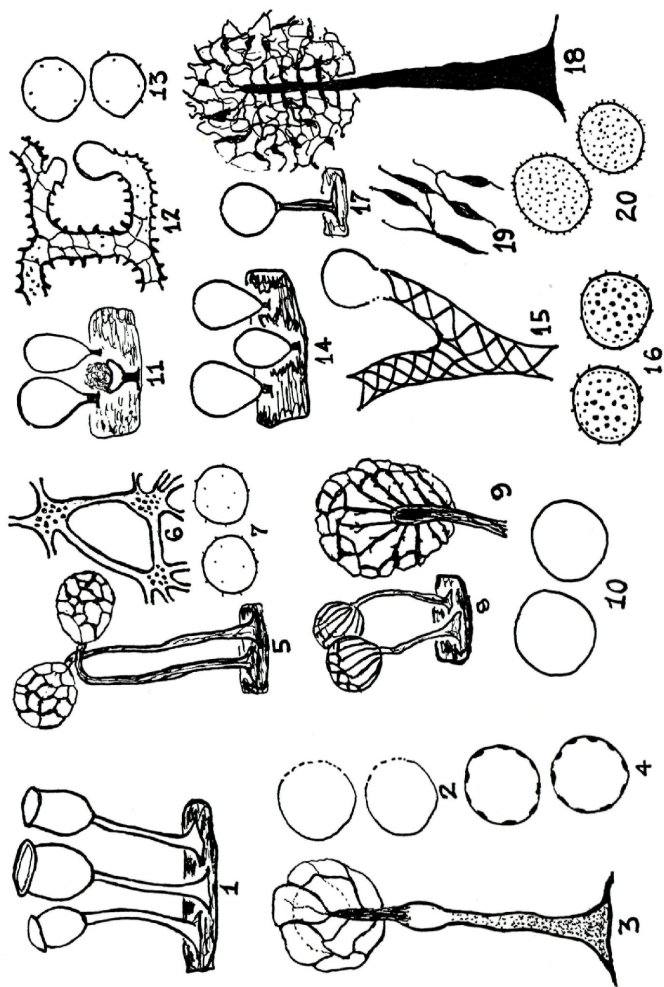
Figs. 5—7: *Cribraria pachydictyon* NANN.-BREM. — 5. Two nodding sporangia with peridial net starting from base,  $\times 100$ . — 6. Nodes and internodes of peridial net,  $\times 300$ . — 7. Spores,  $\times 300$

Figs. 8—10: *Cribraria splendens* (SCHRAD.) PERS. — 8. Two sporangia,  $\times 10$ . — 9. Sporangium enlarged to show origin of ribs from stipe,  $\times 40$ . — 10. Smooth spores,  $\times 500$

Figs. 11—13: *Arcyria nigella* EMOTO. — 11. Fructification,  $\times 10$ . — 12. Capillital threads,  $\times 500$ . — 13. Spores,  $\times 1400$

Figs. 14—16: *Hemitrichia leotricha* (A. LISTER) G. LISTER. — 14. Fructification,  $\times 30$ . — 15. Elater with swollen tip,  $\times 500$ . — 16. Prominently warted spores,  $\times 1250$

Figs. 17—20: *Comatricha nodulifera* WOLLMAN & ALEXOP. — 17. Sporangium,  $\times 25$ . — 18. Enlarged sporangium and capillital net with swollen nodules,  $\times 80$ . — 19. Some capillital nodules,  $\times 150$ . — 20. Spores,  $\times 1500$



granular matter, tapering upwards; hypothallus small rotate, concolourous.

Habitat. — Bark of *Pinus excelsa* (isolated in moist chamber).

Specimens examined. — H. P., Simla, 8. 9. 1978, TNL/RS 812.

Discussion. — While segregating this species from *C. microcarpa*, NANNENGA-BREMEKAMP (1966) points out the pallid nature of the nodes. Although the dictydine granules are pale, in our specimens the nodes, however, are dark coloured due to the compacted dictydine granules. Moreover our specimens also possess a small calyculus — like structure, i. e. the nodes and internodes appear to arise from the tip of the stipe as if piercing the calyculus so that half of it can be inside the calyculus and half outside of it. However, the spores and dictydine granules are always distinctly larger than those of *C. microcarpa*.

5. *Arcyria nigella* EMOTO, Bot. Mag. Tokyo 42: 20. 1928. — Figs. 11—13

Fructification sporangiate, stipitate; sporangia scattered, solitary, erect, subglobose or short cylindrical, 0.3—0.5 mm in diameter, 0.5 mm in length, dull green fading to ochraceous; peridium fugaceous above, leaving a small disc-like calyculus, elastic, threads branched and anastomosed forming dense net, marked with cogs, rings, half rings and spines, appearing reticulate in profile, 4—5  $\mu$ m in diameter; spores dull green, paler by transmitted light, 7.5—9  $\mu$ m in diameter, minutely roughened; stalk small 0.5—0.8 mm in length, tubular, smooth, semitransparent, light yellow, filled with spherical cells (16—22  $\mu$ m); hypothallus rotate, dark brown, opaque, membranous.

Habitat. — Bark of *Cedrus deodara* (isolated in a moist chamber).

Specimens examined. — H. P., Simla, 23. 4. 77, TNL/RS 814.

Discussion. — EMOTO (1928) probably collected the species in nature whereas ALEXOPOULOS (1969) has obtained it on bark of living trees placed in moist chamber. We have also isolated it from the bark of living *Cedrus deodara* tree.

The specimen is quite distinct from all other *Arcyria* by the green colour of the fruiting bodies. Also it possesses rather large and rough spores.

6. *Hemitrichia leotricha* (A. LISTER) G. LISTER, Mycetozoa, 2nd ed. 224. 1911. — Figs. 14—16

Fructification sporangiate, sub-sessile and short stipitate; stalk mostly constriction-like, and measuring about 70  $\mu$ m.

Sporangia scattered, solitary, globose, up to 350  $\mu$ m in diameter, dull olivaceous yellow; peridium single, thin, membranous, semitransparent, opaque otherwise, filled with amorphous matter; dehi-



scence irregular; capillitium composed of branched and sparingly anastomosed smooth threads 3—5  $\mu$ m in diameter, marked with 4—5  $\mu$ m loose spiral bands, swollen at places, partially at the apices and measuring 8—9.5  $\mu$ m; spores olivaceous yellow in mass, paler by transmitted light; prominently warted, warts thick and dot-like in polar view under the immersion oil; hypothallus rotate, brownish.

Habitat. — Bark of *Pinus excelsa* (isolated in moist chamber).

Specimens examined. — H. P., Simla, 15. 8. 78, TNL/RS 816.

Discussion. — The population from Simla (H. P.) resembles in all aspects typical *H. leiotricha* but possesses only a single peridium.

We have not seen *H. intorta*. But according to the description, given by MARTIN & ALEXOPOULOS (1969), the two species appear to be quite distinct by differing in more than one prominent features. The small and gregarious sporangia, larger stipe and spinulose capillitium connected with longitudinal striae clearly differentiate *H. leiotricha* from *H. intorta* and the related *H. clavata*.

7. *Comatriza nodulifera* WOLLMAN & ALEXOPOULOS, Can. Jour. Bot. 46: 157. 1968. — Figs. 17—20

Fructifications sporangiate, stipitate up to 0.9 mm in length; sporangia solitary, erect, globose, dark brown 0.3—0.5 mm in diameter; peridium evanescent; columella reaching nearly the middle of the sporangia, concolorous with stipe, clavate or truncate, sometimes capitate at apex; capillitium apical as well as lateral, main branches thick and dark, branched and anastomosed to form almost an open net, ultimate branchlets lighter and always with nodular swellings measuring about 1  $\mu$ m in diameter almost fusoid; spores dark brown in mass, pale violaceous in transmitted light, globose, minutely spinulose, 9—10  $\mu$ m diameter; stipe 0.4—0.6 mm length, cylindrical, polished, shining, fibrans, reddish brown; hypothallus small discoid concolorous.

Habitat. — Bark of *Cedrus deodara* (obtained in moist chamber).

Specimens examined. — H. P., Simla, 5. 5. 77., TNL/RS 819.

Discussion. — The Fungus derives its name from the very characteristic globose and fusoid, nodule-like swellings on the capillitium. The specimen from Simla resembles the type description very closely differing only in that the sporangia are larger. The size of the fruiting bodies in the Simla collection falls in the range of *C. rigidirota* NANN.-BREM. but the two are entirely different in most of the other features.

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