

THE CLAVARIACEAE OF INDIA—XII*

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THIS paper is intended to record 4 more clavarias collected from the North-Western Himalayas and its contiguous regions in Nepal. The first 11 contributions describe 53 known species, 11 new species and 9 new varieties. The serial numbers of the species are the serial numbers of the clavarias being described in this series. The material of all the collections have been deposited in the Herbarium, Botany Department, Panjab University, Chandigarh and National Fungus Collections, Beltsville, Maryland, U.S.A.

78. *Pterula multifida* Fr., Linnaea, 1830, 5, 531. Figs. 1-2.

Fructifications up to 2.5 cm. tall and 1 cm. broad, fleshy-tough, often caespitose and intermingled with each other forming a continuous single patch, profusely branched from the base, trunk absent, white, becoming light ochraceous on drying. Branching dichotomous, unequal; lower branches up to 800 μ broad, ultimate branchlets slender and up to 60 μ broad; apices acute, sterile, concolorous. *Flesh* white, fleshy-tough. *Hyphal system* dimitic; generative hyphae 2-3 μ wide, subhyaline, branched, thin-walled, septate, clamped; skeletal hyphae 2.5-4.5 μ wide, subhyaline, unbranched, moderately thick-walled, wall up to 1.2 μ thick, aseptate. *Hymenium* non-thickening, up to 30 μ thick. *Basidia* 16-20 \times 5-6 μ , clavate, 4-spored, sterigmata up to 3 μ long. *Basidiospores* 6-7.5 \times 3-3.5 μ , subhyaline, ellipsoid, smooth, shortly apiculate.

Collected on coniferous needles and twigs, Tarund, Dharamsala, H.P., September 7, 1966, 4590.

The chief features of this species are white fructifications with dichotomous slender and hair-like branches, dimitic hyphal system and ellipsoid, smooth basidiospores.

79. *Mucronella aggregata* Fr., Hym. Eur., 1874, p. 629. Figs. 3-4.

Fructifications 200-600 μ long, positively geotropic, spine-like, subulate, 60-150 μ broad at the base, subiculum absent, unbranched, solitary, sometimes caespitose, trunk absent, densely gregarious forming irregular patches on wood, white; apices acute, sterile concolorous. *Flesh* concolorous,

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fleshy, Hyphal system monomitic, hyphae $1\cdot5-3\cdot5\ \mu$ wide, subhyaline-branched, thin-walled, uninflated, septate, clamped. *Hymenium* non-thickening, up to $20\ \mu$ thick. *Basidia* $12-18 \times 4-5\ \mu$, clavate, 4-spored, sterigmata up to $3\ \mu$ long.—*Basidiospores* $4\cdot5-5 \times 2\cdot5-3\ \mu$, subhyaline, ellipsoid, smooth, shortly apiculate, amyloid.

Collected on rotten wood of *Cedrus deodara* Loud., Khijjiar, Chamba, H.P., August 20, 1966, 4585.

The chief features of this species are small, spine-like, positively geotropic and densely gregarious, white fructifications and small ellipsoid, amyloid basidiospores. Miller and Boyle (1943) have treated this species under Hydnaceae but Corner (1950, 1970) has shown that the absence of subiculum justifies its inclusion among the clavarioid fungi.

80. *Clavulina cartilaginea* (Berk. and Curt.) Corner, Monogr. Clavaria and Allied Gen. 299, 1950. Figs. 5-8.

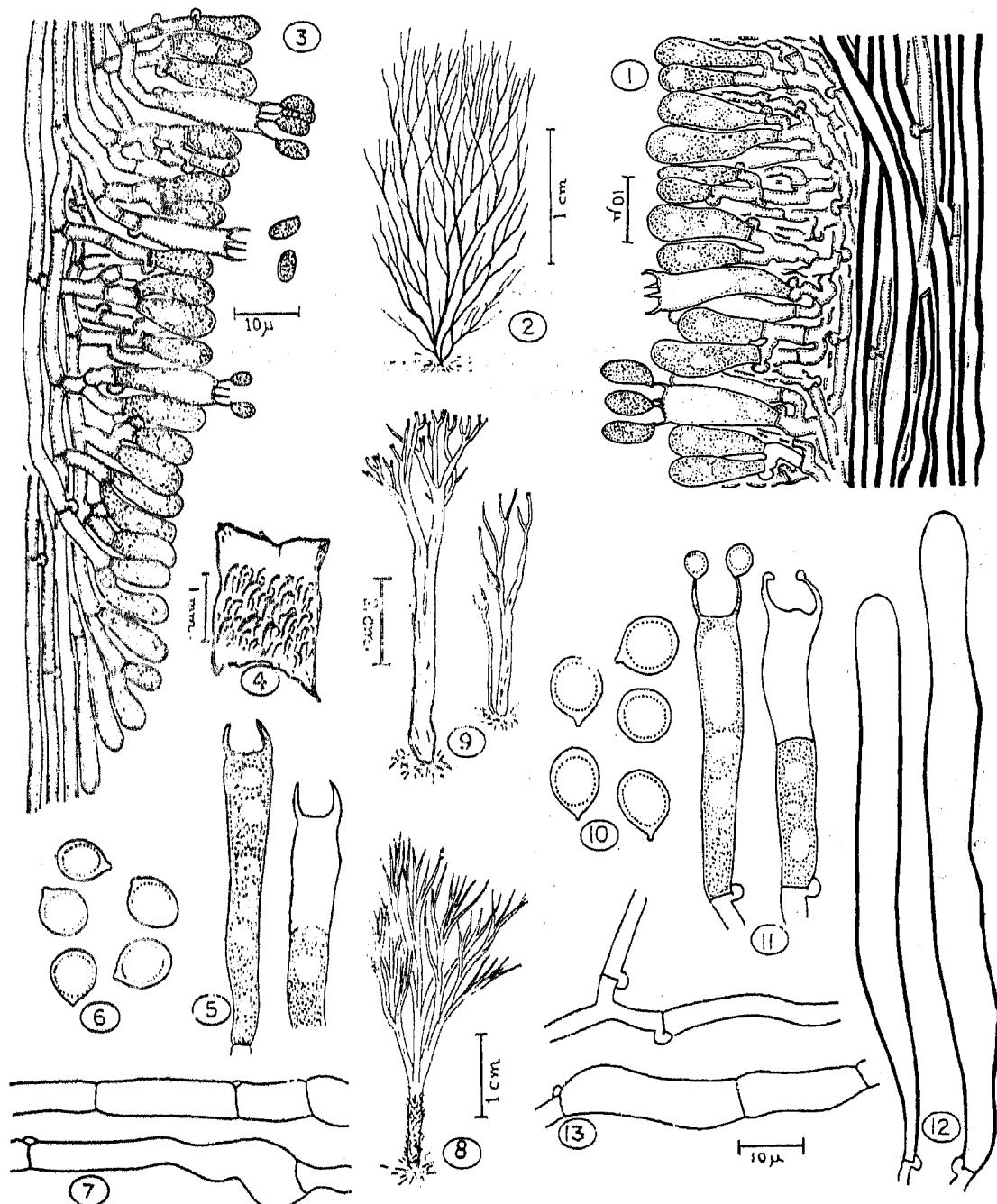
Fructifications 2-5 cm. tall and 1-2.5 cm. broad, single or caespitose, branched, fleshy-tough, pinkish-brown. *Trunk* distinct to indistinct, when present up to 1.5 cm. long and 0.5-2 mm. broad, light brown, cylindrical to flattened, solid, strigose-fibrillose especially at the base. Branching palmate, in one plane, often twisted and irregular, generally flattened below the point of branching; ultimate branchlets slender, $200-500\ \mu$ wide, cristate; apices acute, sterile, paler concolorous. *Flesh* paler concolorous, fleshy-tough. Hyphal system monomitic, hyphae $3-9\ \mu$ wide, subhyaline, branched, thin-walled to slightly thick-walled, wall upto $0\cdot5\ \mu$ thick, septate, sparsely clamped, inflated, often unevenly inflated, generally swollen on one side of the septum forming a sac-like structure up to $15\ \mu$ wide. Hyphae of the strigose fibrils $3-4\cdot5\ \mu$ wide, sparsely branched, septate, clamps rare, uninflated to rarely inflated. *Hymenium* thickening, up to $240\ \mu$ thick, present only on the lower side of the main branches but spreading all around the terminal branchlets. *Basidia* $40-55 \times 6\cdot5-8\ \mu$, clavato-cylindrical, 2-spored, sterigmata straight to incurved, upto $6\ \mu$ long. *Basidiospores* $7-9\ \mu$ in diameter, subhyaline, subglobose to ovoid, smooth, uniguttate, gutta large and filling a greater part of the spore cavity, shortly apiculate.

Collected on soil, Dakshankali, Kathmandu, Nepal, September 6, 1969, 4678.

The chief features of this species are pinkish-brown, tough and palmately branched fructifications, strigose-fibrillose trunk, cristate branchlets and subhyaline hyphae.

81. *Clavulina leveillei* (Sacc.) v. Over., *Bull. Jard. Bot. Buit.*, 1923, p. 260.
Figs. 9-13.

Fructifications up to 10 cm. tall and 3 cm. broad, single to sometimes caespitose, gregarious, fleshy, branched, yellow to yellowish-brown. Trunk



FIGS. 1-13. *Pterula multifida* (1-2). Fig. 1. L.s. of a part of the branch. Fig. 2. Fructification. *Mucronella aggregata* (3-4). Fig. 3. L.s. of a part of the fructification. Fig. 4. Fructification. *Calvulina cartilaginea* (5-8). Fig. 5. Basidia. Fig. 6. Basidiospores. Fig. 7. Hyphae. Fig. 8. Fructification. *Clavulina leveillei* (9-13). Fig. 9. Fructifications. Fig. 10. Basidiospores. Fig. 11. Basidia. Fig. 12. Cystidia. Fig. 13. Hyphae.

1-7 cm. long and 5 mm. broad, cylindrical to somewhat flattened and twisted, longitudinally rugulose, deep cream below but yellow to yellowish-brown above. Branching dichotomous to polychotomous or palmate, sometimes adventitious also, sparse to moderate, mostly crowded at the top; apices acute, sterile, paler concolorous, cristate. *Flesh* white, fleshy. *Hyphal system* monomitic, hyphae 2-9 μ wide, subhyaline, branched, inflated, thin-walled, septate, clamped. *Hymenium* thickening, upto 150 μ thick. *Cystidia* 70-110 \times 8-10 μ , cylindrical to subcylindrical, somewhat undulating, subhyaline, slightly thick-walled, finely incrusted, aseptate, apex obtuse, immersed or projecting up to 25 μ out of the hymenium. *Basidia* 35-45 \times 6-7.5 μ , clavate, 2-spored, sterigmata upto 6 μ long. *Basidiospores* 7.5-10 μ in diameter, globose to subglobose, subhyaline, smooth, uniguttate, gutta filling a greater part of the spore cavity, shortly apiculate.

Collected on soil, Hathi Ban, Kathmandu, Nepal, August 21, 1969, 4671; on soil, Dakshankali, Kathmandu, Nepal, September 6, 1969, 4676; 4677.

The chief features of this species are sparsely branched, yellow to yellowish-brown fruit bodies, cristate tips and presence of cystidia. The cystidia are large, slightly thick-walled and finely incrusted and serve to distinguish this species from the allied *Clavulina hispidulosa* Corner, Thind and Anand and *C. Mussooriensis* Corner, Thind and Dev. Thind (1961) has discussed in detail the relationship of these species.

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