

Diversity of epiphytic mosses of Lonavala

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Abstract

Mosses are highly developed groups of bryophytes having a unique position between lower cryptogams and vascular plants preferring marshy swamps or wetland habitats for their abundant growth. They play an important role in conservation of buffer zones or edges between wetland and forest ecosystems habitats.

Lonavala is a beautiful hill station in the Western Sahayadri ranges about 102 km from Mumbai. It is surrounded by hills, valleys, wetlands and dense green forest. Mosses grow there abundantly.

Present paper deals with diversity, ecological habitats and growth forms of epiphytic species of mosses investigated at Lonavala.

Mosses are a highly developed group of Bryophytes, occupying a unique position between lower cryptogams and vascular cryptogams. They like lower cryptogams, have filamentous protonema looking like some green filamentous algae and like high cryptogams they have a conducting stands.

Systematic studies on some members of this group are available in the form of Moss floras of Eastern India⁷, North West Himalayas¹ and Nilgiris⁶, Mosses of Western Ghats⁴.

The flora of Khandala on the Western Ghats of India, *Rec. Bot. Surv. India* XVI⁸, A third list of mosses from Western India⁹ Mosses are highly sensitive to atmospheric pollution, especially the epiphytic mosses. They can absorb heavy metals from the atmosphere.

They show several injury symptoms on exposure to metal pollutants. Thus they serve as very good bio-indicators to pollution. This aspect is of very much importance to environmentalists and of great relevance in conserving ecosystems especially in popular hill stations like Lonavala.

The present paper highlights diversity of epiphytic mosses around dense forest of Lonavala, their ecological habitats and growth forms. The abundance of mosses in any region reveals a highly unpolluted environment and is an indicator of forest conditions and they play a key role in ecosystem.

Area under study : Lonavala is a beautiful hill station in the Western Sahayadri ranges about 102 km from Mumbai. It is

surrounded by hills, valleys, wetlands and dense green forest. Mosses grow their abundantly.

The mosses were collected are from dense forests amidst the Valvan dam, Bhushi dam, extending upto Sunlight point, Rye wood Park. The mosses collected were identified, dried and preserved in packets. The data regarding botanical name, locality of collection was noted on the packets.

Preservation of material – dry & wet :

Mosses being more acidic in nature, they are easily preserved free from infection by fungi and insects by themselves. Material collected in the field was exposed to dry in open shade. After drying it was kept in packets 13.5 x 15.5 cm in size. Date of collection, locality from where it is was collected, latitude, habitat, etc. were noted in field note book and also on the packets containing the material. Some of the material which was very minute or less in quantity was preserved by preparing slides. Media used for preparing slides was Gum-Chloral.

A total no of five epiphytic mosses where observed which are described below-

1. *Octoblepharum albidum Hedw. Sp. Musc. 50, 1801, Musc. Frond, iii, 15 C.M. Syn. Musc., I, 80 Broth. Pfl X 226.*

Plants dense whitish green or brownish, epiphytic, upto 1.2 to 2 cm. high, forming tufts on tree trunks. Leaves crowded, erect, spreading apex pointed, changes when dry. 5.5. mm long. Ligulate, base concave wide, hyaline and apiculate, margin entire or slightly undulate; nerve broad and thick,

multi layered with a median row of triangular chlorocysts with 3-4 layers of leucocysts on both the dorsal and ventral slides. Leaf base flanked by 5-6 rows hyaline, rectangular, elongated. Seta erect 6.5 mm long. Capsule erect, oblong ovoid, greenish brown. Peristome teeth 8, yellowish, well spaced with a longitudinal fissure. Light brown spores are papillose, globose.

Distribution :

This epiphytic species is very common on the burnt area of hollow cavities of tree trunks or decayed wood at Rye wood Park, Lonavala. Also reported at Khandala² Mahabaleshwar³. It is cosmopolitan and widely distributed in tropical and subtropical countries. It is very common in East Nepal, Sikkim, Darjeeling, Orissa, Arunachal Pradesh (NEFA), Assam, Western Ghats, Outside India, it is also found in Ceylon, Burma, Thailand, Vietnam, Java, New Guinea, Africa Cape, W. (Knysna ex – Rehm) Natal Great Noodsberge (J. Wood), Transvaal, Macmae (MacLea, Rehm), Portuguese E. Africa, Mazakwen Forest, Lourenzo Marques, Junod and Americal (Hawaii), Zimbabwe (Sim), Makani Forest as Rhodasia (Eyles), Phillipines, China.

It can be easily recognized by the light green colour of ligulate tufts of leaves and oblong ovoid brown, erect capsule when dry.

2. *Macromitrium sulcatum (Hook.) Brid:*

Plants robust glossy, red brown plants with yellow tips, densely tufted, Branches upto 5 cms long Leaves all alike, crowded, erect, long, lanceolate, leaf base cells.

Narrow rectangular seta erect, soon

becoming lateral, red, capsule exerted, ovoid. Spores light to dark brown

Distribution :

This epiphytic moss was growing on the branches of trees at Rye wood park, Lonavala. It also grows luxuriantly at Khandala, Matheran, Thailand, Srilanka and other South Asian countries.

3. *Erpodium magniferae* C., Muell., *Linnea* 37:178.1872; *Erpodium bellii* Mitt., *J. Linn. Soc.* 13:307, 5 B., 1873 fide; Dix., *J. Bot.* 47:160. 1909.

1.0 – 1.5 cm high, rhizoids on the lower side throughout, laxly tufted, prostrately branched stem. Branches irregularly pinnate, elongated, densely and rounded leaves. Branches julaceous when moist. Leaves imbricate, appressed when dry, erecto-patent to patent, when moist oval-ovate, concave 1 mm long, margin entire, leaf apex acute to sub-acute. Costa absent. Leaf cells wide, smooth, parenchymatous, some what elongated; 6-sided, nearly twice as long as broad, in the upper marginal region. Leaf (Laminar) cells rounded hexagonal, small, towards the margin they form longitudinal rows of cells, rectangular to 6-sided, upto 25 x 15 μ . Sporophyte not seen.

Distribution - Epiphytic on the bark of Mango and Banyan trees near Bhushi dam, Lonavala. Also found in Mahabaleshwar² and Khandala³. This species which is common at many places in India is widely distributed in tropical region of the world.

4. *Stereohyllum tavoyense* (Hook). Jaeg., Plants slender, tufted, light green to dark

green, glossy on the bark of trees. Primary stem creeping, 2 to 3 cm long. Secondary branches of stem erect, nearly as long as primary stem, flat, leafy. Leaves appressed when dry and widely spreading when moist. Ligulate to lanceolate acuminate, 1.5 mm of long. Nerve upto the middle leaf concolorous. Leaf (Laminar) cells rhomboidal to linear, thick cells walled. Leaf margin entire, slightly undulate. Alar cells quadrate to rectangular thick walled.

Sporophytes on secondary stems 1 to 1.5 cm in height. Foot cylindrical, 1 mm, seta long, brownish, 5-9 mm high, capsule cylindrical. Peristome double, outer teeth 16, yellowish brown; and inner ones 16, cilia colourless. Each tooth lanceolate, densely cross-stripped. Spores rounded to oval, brown, papillose, 15 – 18 μ in diameter.

Distribution:

Growing on the bark of trees near Karla caves, Lonavala. Also reported from Mahabaleshwar², Khandala⁸.

5. *Calymperes thwaitesii* (Besch.) Fleisch.

Plants were small forming short bluish or yellowish green tuft with a felt of rhizoids in their lower part. Stem 1 to 1.5 cm, high enclosed by leaves and fine smooth axillary rhizoids. Leaves when dry nearly erect, slightly contorted and incurved. On keeping them in moist condition, they become erectopatient, lanceolate, concave with wavy margin and round apex. Margin of the leaf apex is denticulate. Terminal leaves are acuminate, lingulate and with an excurrent nerve. Transversely septated, clavate gemmae present only at the tips of terminal leaves

The hyaline basal part of the leaf narrow, oval with loosely arranged rectangular to polygonal cells. The top cells of the hyaline basal region of leaf are rhomboidal. Teniolae, (intralamianr cells) rectangular, elongated in 3-5 series; persistent from the basal hyaline region to the middle part of leaf. Hyaline marginal cells at the leaf base in 1-2 series. The chlorophyllose laminar cells are prosenchymatous, thin – walled, quadrate, to hexagonal, prominent, percurrent in normal leaves, but excurrent in gemmiferous leaves. Cells of the midrib rectangular, elongated. Basal part of the midrib become flat higher up circular with one row of deuter or water – conducting cells there are two steroidal bands above the deuter cells. A star-like cluster of clavate gemmae present at the tip of the excurrent midriff of the leaves. Gemmae transversely septate, light green in colour.

Distribution - Found on bark of trees near Kune falls, Lonavala and common tree trunks on costal line of Western India.

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