

MOSSES OF AGUMBE-HULICAL RANGES, SHIMOGA DISTRICT

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A B S T R A C T

In this paper the mosses collected from Agumbe-Hulical ranges (Shimoga district) of Western ghats are described. Two species have been reported for the first time from India and two species are recorded as new reports from South India.

INTRODUCTION

The forests of the Western ghats in general are presented in several publications to need any introduction here. But the data pertaining to cryptogamic flora of this region remains largely unknown. Dixon (1909, 1912, 1914 & 1921) has worked on some mosses of Mahableshwar (Satara district) and Kanara district along the Western ghats, and Blatter and Almeida (1922) had likewise concentrated on the ferns of the Bombay Presidency. With the exception of one or two scattered references pertaining to individual plants, the available literature on the bryology of Western ghats is practically limited. No doubt, much work has been done on the mosses of other regions of South India, especially Coorg district of Mysore State (Brotherus 1899) as well as on the Palni and Kodaikanal hills (Varde 1922-25, 1928; Foreau 1930, 1961 & 1964).

In this paper, some salient aspects of mosses collected from a topographically interesting narrow belt of evergreen forests comprising the Agumbe-Hulical ranges in Shimoga district (Mysore State) are being presented. The areas explored are bound on the south-west by South Kanara district and to the north by North Kanara district of Mysore State, and geographically lie between latitude $13^{\circ}27'-13^{\circ}45'N$ and longitude $74^{\circ}57'-75^{\circ}25'E$. This area includes one of the rainiest localities in peninsular India with an average rainfall of 805 cm per annum. The altitude generally ranges between 600-900 m, the highest peak being Kundadagudda (880 m). In summer the maximum temperature goes upto $\pm 36^{\circ}C$ and in the winter the minimum temperature is as low as $\pm 12^{\circ}C$. The altitude by itself has no appreciable effect, but it is the high velocity of rainfall, coupled with the effect of high winds, blowing from west and south-west, especially during the monsoon which control the distribution of the species and naturally epiphytes such as mosses, lichens and orchids flourish luxu-

riantly. The trees particularly in the evergreen zone are practically laden with mosses and besides, the moist shady rocks with humid soil provide the ideal habitat for the growth of mosses.

The area is of exceptional interest in that it has not been upto the present time much explored botanically. The collections of the phanerogams, made by the senior author with the object of compiling the Flora of Shimoga district, will be treated elsewhere. The moss collections are interesting both botanically and phytogeographically, because within such a small collection of 28 species comprising of 16 families (under 21 genera), 2 species are new records for India and two for peninsular India. A number of these species, earlier known from peninsular India, reveal their further extension towards the north along the Western ghats.**

In the enumeration that follows, the families and the genera are arranged as in Brotherus (1924-25). Under each species, only some of the interesting aspects of habitat, field diagnostic characters and distribution, locality, field number and date of collection have been given. Those species originally determined as new records for India, are preceded by asterisk (*) and such species preceded by a dagger (†) are new records as far as ascertainable, for South India. It would be desirable to carry out further intensive studies on the moss flora of Western ghats.

The specimens cited have been deposited in the regional herbarium of Botanical Survey of India, Western Circle, Poona (BSI).

ENUMERATION

DICRANACEAE

Leucoloma walkeri Broth.

Greenish-brown shining plants in extensive cushions. Leaves linear, curled when dry. Capsule erect, small, cylindric, brown. Common on tree

trunks and moist soil. Agumbe 600 m, *Raghavan* 62402A; Someshwar ghat, 600 m, *Raghavan* 62673 (May 14 & 15, 1960).

LEUCOBRYACEAE

Octoblepharum albidum Hedw.

Dense whitish-green plants in small cushions. Leaves crowded, recurved, ligulate from a concave hyaline base, apiculate; nerve broad; chlorocysts triangular. Capsule oblong-ovoid, greenish-brown. Operculum oblique, rostrate. Common on moist soil and tree trunks. Hulical 800 m, *Raghavan* 90442 (Oct. 16, 1964).

POTTIACEAE

Hymenostomum edentulum (Mitt.) Besch.

Greenish-brown plants in compact cushions. Capsule small, erect, cylindrical, brown. Peristome absent. Common on stones. Agumbe forest lodge 600 m, *Raghavan* 62804A (May 21, 1960).

Hyophila involuta (Hook.) Jaeg.

Plants in dense green-brown cushions. Leaves strongly involute, appressed and arched when dry. Capsule erect, narrowly cylindrical, brown. Peristome absent. Very common on exposed rocks. Sunset point 600 m, *Raghavan* 62682 A (May 19, 1960).

***Trichostomum duriusculum** (Mitt.) Broth.

Green plants in dense extensive cushions. Capsule erect, cylindrical, brown. Peristome present. Common on moist soil and stones. Someshwar ghat road 600 m, *Raghavan* 62679 (May 18, 1960).

FUNARIACEAE

Funaria hygrometrica Hedw.

Plants in loose, yellowish-green, small tufts or extensive cushions. Capsule inclined-horizontal, pyriform, asymmetrical, greenish-brown, deeply sulcate when dry. Very common on rocky moist slopes and also on moist soil in shady areas. Hannagere-gudda 800 m, *Raghavan* 82769 (Sept. 28, 1962); Hulical 800 m, *Raghavan* 83039 (Oct. 8, 1962); Silviculturist Nursery Agumbe 600 m, *Raghavan* 83159 A (Oct. 12, 1962); Kanagalgudda 600 m, *Raghavan* 90100A (Aug. 23, 1963).

F. hygrometrica Hedw. var. **calvascens** (Schwaegr.) Mont.

Plants in loose, greenish-yellow small tufts. Seta much longer than the type. Fairly common on moist soil. Agumbe forest lodge 600 m, *Raghavan* 82806 (May 21, 1960).

BRYACEAE

Brachymerium nepalense Hook.

Pale-green plants in small compact tufts. Leaves

aristate. Rare, in rocky crevices in association with *Bryum coronatum* Schwaegr. Hulical 800 m, *Raghavan* 90441C (Oct. 16, 1964).

Bryum ghatense Broth. et Dix.

Light-green plants in small loose tufts. Leaves erect. Capsule erect-horizontal, pyriform, long necked, greenish-brown. Fairly common in rocky crevices. Agumbe forest lodge 600 m, *Raghavan* 62807 (May 21, 1960).

B. argenteum Hedw.

Plants in shining whitish-silvery small dense cushions. Stem with 3-5 small innovations. Leaves erect, imbricate. Rare, in stony crevices in association with *Hymenostomum edentulum* (Mitt.) Besch. Agumbe forest lodge 600 m, *Raghavan* 62804B (May 21, 1960).

B. coronatum Schwaegr.

Plants in small, pale yellowish-green close cushions. Leaves closely appressed when dry. Capsule horizontal-pendulous, cask-shaped, constricted in the middle on drying, deep brown. Operculum conical. Common, on rocky moist slopes and crevices, sometimes in association with *Funaria hygrometrica* Hedw. and *Bryum wightii* Mitt. Agumbe forest lodge 600 m, *Raghavan* 62805 (May 21, 1960); Kanagalgudda 600-m, *Raghavan* 90100B (Aug. 20, 1963); Hulical 800 m, *Raghavan* 90441 A (Oct. 16, 1964).

B. wightii Mitt.

Plants in small, green lax tufts. Capsule pyriform, greenish-brown. Operculum conical. Common, in rocky crevices in mixture with *Bryum coronatum* Schwaegr., and some members of Scrophulariaceae and Lentibulariaceae. Kanagalgudda 600 m, *Raghavan* 90099 (Aug. 20, 1963); Hulical 800 m, *Raghavan* 90441 B (Oct. 16, 1964).

MEESEACEAE

†Meesea uliginosa Hedw.

Plants in greenish-brown dense tufts. Leaves erect when dry. Seta long. Capsule inclined to slightly curved, oval from an erect tapering neck. Operculum conical, obtuse. Rare, on moist soil in association with *Leucoloma walkeri* Broth. Agumbe 600 m, *Raghavan* 62402 B (May 14, 1960). It is new record for S. India, being previously recorded from Sikkim, Central Asia, Caucasus, Europe etc.

ORTHOTRICHACEAE

Macromitrium leptocarpum Broth.

Strong plants in brownish-green extensive carpets. Leaves crisped when dry. Capsule small, cylindrical, smooth. Common on rocks. Someshwar ghat road 600 m, *Raghavan* 62681 (May 18, 1960).

****Macromitrium sulcatum** (Hook. et Grev.) Brid.

Plants in dense, brownish-green extensive cushions. Capsule small cylindrical, brown, sulcate. Seta rough. Fairly common on wet rocks. Someshwar ghat road 600 m, *Raghavan* 62680 (May 18, 1960).

RHACOPILACEAE

****Rhacopilum schmidii** (C. Muell.) Mitt.

Plants in yellowish-brown close mats. Leaves flat. Rare, on moist soil in association with *Meesea uliginosa* Hedw. and *Leucoloma walkeri* Broth. Agumbe 600 m, *Raghavan* 62402 C (May 14, 1960).

CRYPHAEACEAE

***Dendropogonella rufescens** (Schimp.) Britt.

Plants in loose, pale yellowish-brown mats. Stem irregularly branched. Leaves lanceolate, long acuminate. Rare, on the bark of *Poeciloneuron indicum* Bedd., in association with *Vesicularia reticulata* (Doz. et Molk.) Broth. Someshwar ghat road 600 m, *Raghavan* 62764A (May 20, 1960). It is a new record for India and previously it has been reported from Mexico, Guatemala. (Figs. 1-5).

METEORACEAE

****Meteoropsis squarrosa** (Hook.) Fleisch.

Strong plants in yellowish-green tufts. Secondary branches densely leafy. Leaves spreading, squarrose, often curved back, ovate-acuminate, with apices characteristically twisted back. Fairly common, hanging from rocks in association with *Vesicularia succosa* (Mitt.) Broth. et Dix., under the shade of *Pteris* fern. Someshwar ghat road 600 m, *Raghavan* 62678A (May 18, 1960).

****Papillaria fuscescens** (Hook.) Jaeg.

Plants in loose, yellowish-brown mats. Stem irregularly branched. Leaf-cells with many papillae. Rare, on moist rocks in association with *Pinnatella limbata* Dix. and *Platyhypnidium rusciforme* (Neck.) Fleisch. Agumbe 600 m, *Raghavan* 62530C.

NECKERACEAE

Pinnatella limbata Dix.

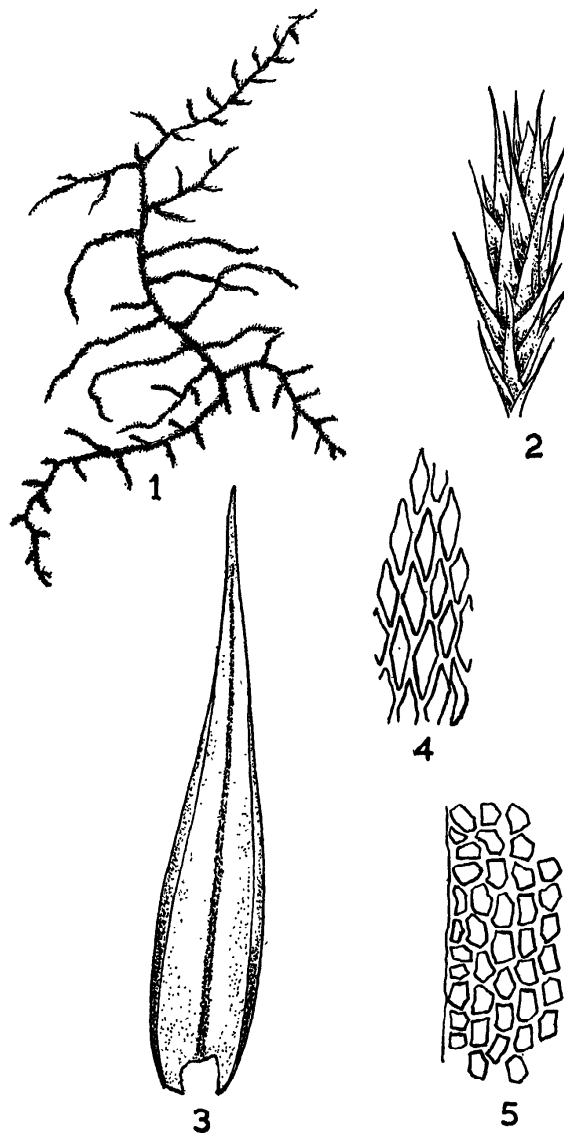
Plants in dull green loose carpet. Primary stem almost naked. Secondary stem densely leafy. Leaves slightly plicate. Fairly common, on moist rocks in association with *Papillaria fuscescens* (Hook.) Jaeg. Agumbe 600 m, *Raghavan* 62530A (May 15, 1960).

THUIDIACEAE

Thuidium trachypodum (Mitt.) Doz. et Molk.

Plants in densely caespitose, yellowish-brown mats. Secondary branches bipinnate. Seta slender. Fairly

common, on moist rocky soil in shady places in association with *Pogonatum microstomum* (R. Br.) Brid. and some ferns. Hulical 800 m, *Raghavan* 86240B (Feb. 14, 1963).



Dendropogonella rufescens (Schimp.) Britt.

Figs. 1-5: 1. Plant in wet condition $\times 1$. 2. A branch $\times 10$. 3. Leaf $\times 60$. 4. Laminar cells $\times 560$. 5. Basal marginal cells $\times 560$.

AMBLYSTEGIACEAE

****Platyhypnidium riparioides** (Hedw.) Dix.

Strong plants in yellowish-black loose mats. Stem irregularly branched; branches densely leafy. Leaves ovate, acute, laxly appressed when dry. Rare, on

moist rocks in association with *Pinnatella limbata* Dix. and *Papillaria fuscescens* (Hook.) Jaeg. Agumbe 600 m, *Raghavan* 62530B (May 15, 1960).

ENTODONTACEAE

Entodon plicatus C. Muell.

Plants in loose, intricate yellowish-green mats. Secondary stem irregularly pinnate, decumbent, flattened. Leaves imbricate. Capsule erect, cylindrical, brownish-green. Very common, on rocks and moist soil in association with *Pogonatum aloides* (Hedw.) P. Beauv. Begar 600 m, *Raghavan* 83305B (Oct. 17, 1962).

HYPNACEAE

***Bryosedgwickia densa** (Hook.) Biz. et P. Vard.

Slender plants in greenish-brown small mats. Stem irregularly branched. Leaves broadly ovate, acuminate. Capsule cylindrical, brown. Rare, on the bark of a tree. Near Vanakaeabbi falls-Agumbe 600 m, *Raghavan* 62547A (May 16, 1960).

It is a new record for India and is reported previously from Mexico and Ecuador. The earlier recorded species of this genus is *B. kirtikarii* Card. et Dix. from Poona district.

†Vesicularia succosa (Mitt.) Broth. et Dix.

Plants in slightly dense yellowish-brown mats. Stem irregularly branched. Branch leaves toothed at apex. Capsule horizontal, cylindrical, brown. Fairly common, on rocks in association with *Meteoriopsis squarrosus* (Hook.) Fleisch. Someshwar ghat road 600 m, *Raghavan* 62678B (May 18, 1960).

It is a new record for South India, being earlier reported from Nepal, Sikkim etc.

****V. reticulata** (Doz. et Molk.) Broth.

Strong, yellowish-green plants in dense mats. Stem pinnately branched. Leaves appressed when dry. Capsule inclined-horizontal, cylindrical. Fairly common, on the bark of *Poeciloneuron indicum* Bedd., in association with *Dendropogonella rufescens* (Schimp.) Britt. Someshwar ghat road 600 m, *Raghavan* 62764B (May 20, 1960).

POLYTRICHACEAE

****Pogonatum microstomum** (R. Br.) Brid.

Gregarious, greenish-brown plants in extensive cushions. Leaves erect and appressed when dry. Capsule erect, cylindrical, smooth, brownish-green. Operculum rostellate. Calyptra with hairy felt, covers whole of the capsule. Fairly common, on moist rocky soil in shady areas in association with

Thuidium trachypodum (Mitt.) Doz. et Molk. Hulical 800 m, *Raghavan* 86240A (Feb. 14, 1963).

****P. aloides** (Hedw.) P. Beauv.

Plants in greenish-brown extensive cushions. Leaves arched and coiled when dry. Capsule erect, oblong-cylindrical, deeply furrowed when dry, greenish-brown. Calyptra with hairy felt, covers whole of the capsule. Common, on rocks and moist soil in association with *Entodon plicatus* C. Muell. Begar 600 m, *Raghavan* 83305A (Oct. 17, 1962).

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