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Distribution of the species

(Map no. XVIII)

As3b - Sikkim - J.D. Hooker No. 373, 374, 376, 380, 384
Nepal - (between Lobuje and Karpo) Zimmerman 330

Europe and India (Eur.; As 3b).

Subseries - b) Metacranoidae

ORDER - EUBRYALES

Both acrocarpic and pleurocarpic mosses are included in this large group, but the acrocarpic forms predominate and only these are represented in India. The peristome is diplolepidous, but it differs from the Funariaceae in the peristome rings by being metacranoid. Perennial, often strongly developed plants, leaves variable, calyptra cucullate, peristome double, normally Bryoid, i.e. with endostome consisting of a basal membrane, processes lanceolate, keeled, more or less slit or perforate, cilia present or rudimentary, dorsal layer of outer teeth frequently finely striolate transversely or obliquely.

This order consists of 8 families, of which only five families are the representatives of Eastern India.

1. Bryaceae
2. Leptostomaceae ... (no representative in Eastern India).
3. Ugniaceae
4. Drepanophyllaceae ... (no representative in Eastern India).
5. Rhizogoniaceae
6. Hypnodendraceae ... (no representative in Eastern India).
7. Neesaceae and
8. Bartramiaceae

Family - Bryaceae

Plants of variable size, usually tufted. Stems erect, radiculose below, often with sub-floral innovations towards the base or below the inflorescence. Lower leaves small, upper larger forming a comal tuft, generally leaves lanceolate; costa ending in or near apex and sometimes nerve long and frequently excurrent, the tissue usually thin and much shrunken when dry, less linear or rhomboidal, prosenchymatous, smooth, thin walled, often narrower in several rows at margins. Seta elongate. Capsule pendulous or inclined, rarely erect, symmetrical or nearly so, varying from rounded pyriform to narrowly clavate usually with a distinct shorter or longer tapering narrow neck, not striate, lid convex, mamillate or apiculate, rarely with a longer point. Calyptra narrow, cuculate, smooth, soon falling off. Peristome normally double, outer peristome composed of 16 lanceolate teeth, which is undivided, densely articulate and internally transversely trabeculate, inner peristome thin pale, usually of 16 more or less perforated processes alternating with the teeth from
a high basal membrane, with or without intermediate cilia varying in development and number, often nodose with short transverse appendages at intervals.

TAXONOMIC TREATMENT OF THE FAMILY BRYACEAE

This family was divided into 3 subfamilies by Brotherus
1. Orthodontioideae, 2. Wieichhoferioideae and 3. Bryoideae
and recorded the following 9 genera in Engler & Prantl's "Naturlichen Pflanzenfamilien, Musci (1924) - Wieichhoferia, Webera, Miobryum, Epinterygium, Brachymenium, Anomobryum, Leptobryum, Bryum and Rhodobryum. In 1963 Plagioicryum was known as a new genus from the regions. So, according to Brotherus system 10 genera have been recognised upto the present.

Brotherus system has been adopted by all the American and European Bryologists as well as some Japanese authors for a long time. But his concept regarding species and genera seems to be too limited. Nyhlom (1963) divided this family into 3 subfamilies and recorded 8 genera from the Fennoscandian area. Her system of classification is even close to Brotherus, though she has tried to reduce many species. According to Dixon's book 9 genera which have been also reported from the regions are listed in the British Islands. He represents 9 such genera into the following 5 genera Oreas, Leptobryum, Webera (Miobryum and Epinterygium united) Plagioicryum and Bryum (including Anomobryum and Rhodobryum). His concept
regarding genera and taxonomic system are more natural in view of the natural classification than Brotherus. A. LEROY Andrews seems best among the recent authorities in the world concerning the classification of this family. His concept and system are seen in Grout's "Moss Flora" (1935-40). He divided this family into two subfamilies: Pohlioideae and Bryoideae and reported the following 7 genera: *Mielichhoferia*, Orthodontium, *Lentobryum*, *Pohlia*, *Brachymenium*, *Bryum* and *Phaeobryum*. His concept denoting the *Pohlia* includes *Anomobryum* is treated as a separate genus, contrary to Dixon's system, *Phaeobryum* is also treated as a separate genus. Andrews' system has been previously adopted by both NOGUCHI and Ochi.

In this paper Andrews system of classification has been followed regarding the division of this family into two subfamilies. *Anomobryum* better be transferred to *Bryum* contrary to the Andrews' concept for the following reasons: As pointed out by him the narrow leaf cells and propagula may certainly be of the *Pohlia* type. But the narrow cells are rather quickly shortened and becoming broader at the base of leaf. This character is also recognized in some species of *Bryum* such as *B. pseudoalpinum*, *B. porphyrodon* and *B. alpinum*, and the resemblance is even seen in *B. argenteum* and *Brachymenium exile* and not seen in the species of *Pohlia*. In addition to this character, the leaves are very concave, not much pointed or long acuminate and narrow.
The genus *Rhodobryum* should be treated as a separate genus because lower stem leaves scaly and upper leaves large forming rosette in the cornel region, plant large, robust with clustered seta, all these characters show that this genus should not be included under *Bryum*.

Finally the Bryaceae may be divided into 2 Subfamilies and 7 genera.

Subfamily I. *Pohliioideae*
1. *Melichhofria*
2. *Pohlia*
3. *Epinterygium*

Subfamily II. *Bryoideae*
4. *Brachymentium*
5. *Plagiobryum*
6. *Bryum*
7. *Rhodobryum*

Key to the Eastern Indian genera and subfamilies

1. Leaf cells usually elongated, 4:1 or longer, not abruptly shortened at base
   **2. (Pohliioideae)**

Leaf cells usually broader, less than 4:1, if longer abruptly shortened at base
   **4. (Bryoideae)**
2. Inflorescence on short lateral branch
   outer peristome absent .. 1. *Melichhoferia*
Inflorescence terminal, outer
peristome present .. 2.

3. Leaves linear lanceolate with narrow
costa, cilia rudimentary to long or
absent, but never appendiculate .. 2. *Fohlia*
Leaves not linear and dimorphous.. 3. *Epistegium*

4. Plant medium to large .. 5.
Plant gigantic .. 7.

5. Inner peristome without definitely
differentiated segments, capsule
erect .. 4. *Brachymenium*
Inner peristome with definitely
differentiated segments .. 6.

6. Plants poor in chlorophyll, outer
peristome shorter than inner one 5. *Plagiochusa*
Plants rich in chlorophyll, outer
peristome almost equal with the
inner one .. 6. *Bryum*

7. Plant large, lower leaves small,
scale, upper leaves forming
rosette .. 7. *Rhodobryum*
Map no. XIX - Showing the number of recorded species of *Mielichhoferia* in each zone and also the distribution of *M. assamica* Dix. (*•*). Not reported from zones where not shown.
Subfamily - Pohlioideae


Both male and female inflorescences are produced on short lateral branches and the Peristome of the capsule is single (the outer one is lacking).

GEOGRAPHICAL DISTRIBUTION OF THE GENUS MIELICHHOFERIA

Index muscorum (Vol. 3, 1964) recorded 131 valid species of Mielichhoferia, distributed all over the high, cool and moist regions of the world, except in a few regions. The distribution pattern shows greater condensations in certain areas of tropical and temperate regions such as South America and middle Africa. This genus is almost completely absent in arctic and sub-arctic regions of the earth. The distribution showing the number of species in each zone in Map no. XIX. Out of 6 species occurred in India only one species (M. assamica) occurred in As3b (Eastern India). One species (himalayana) occurred in Western India (As 3a) other species (Schmidi) occurred in South India, 4 species are known to occur in As 2 and 6 from As 4.

Single species M. assamica


Plants densely tufts of yellowish green or green colour
ig. 20. *Mielichhoferia assamica* Dix.
(Drawn after Dix, 211 type specimen)
P₁ = natural size plant, P₂ and P₃ = magnified normal
and dry plant. L = leaf. LBC = leaf base cells.
l = leaf apex, l = central leaf cell
13 m.m. Sometimes it is more higher. Stem brown, matted with radicles below. Stem erect, branched densely foliated. Leaves erect when moist, not much altered when dry, linear lanceolate up to 1.8 m.m. long and + .38 m.m. broad at base, slightly denticulate in apical part, margin plane or slightly reflexed. Costa fairly strong, percurrent about .019 m.m. in diameter. Leaf cells thick walled, upper linear vermicular about .045 m.m. long and .007 m.m. broad, becoming shorter and rectangular at base + .019 m.m. to .057 m.m. long and + .007 to .011 m.m. broad, at basal margins 1 to 2 rows of square short rectangular cells present + .019 m.m. long and + .011 m.m. broad. Apical marginal cells 1 to 2 rows, but longer and narrower than the basal cells + .03 to .045 m.m. long and + .007 m.m. broad. Dioicous, inflorescence on short lateral branch.

Sporophyte not seen.

**Distribution of the species**

(Cap no. XIX)

As3b - Khasia and Jayantia hills - Borelli river bed, (300 m.) Bhalukpong, Lor. 211.

Only in Eastern Indie (As3b).