

# Atlas of *Bryum* Hedw. Species from India

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## ABSTRACT

India is recorded as one of the mega biodiversity countries on the earth. The unique geographical zone and the physical-climatic features of the various biogeographic area resulted in the remarkable floral diversity of India. Bryophytes are small imaged amphibians with three different lineages such as liverworts, hornworts and moss. The category moss represents the largest group with more number of species. The present study aims to compile *Bryum* species of India based on all the available literature and information from herbaria of various organizations. *Bryum* is one of the largest genus among the moss species with morpho-plasticity of characters. Leaves form the unique character of the species, but a high discrepancy in leaves is recorded among the various species of the genus therefore it is wise to select other features unless it is established on specimens of diverse ecology. Sporophytic characters are ideal, but in most species, they remained unexplored as compared to the gametophytic datay. Similarly, the sporophytic capsules are highly diverse in size and their configuration is often irregular with abnormal peristomial characters. Further, the spores are diverse in size and shape. More than 45 species were recorded by various bryologists from India. Many species are similar in look with confusing characters. Therefore, revision of *Bryum* is warranted to eliminate the overlapping and complex allied clusters among the reported species.

**Keywords:** Bryophytes, *Bryum*, Characters, Distribution, India, Species diversity.

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## INTRODUCTION

Bryophytes are specialized species that represent the second highest lineage among terrestrial plants after the Angiosperms.<sup>[1]</sup> Most of the species possess high surviving capacity under a wide variety of environmental conditions and also form an inherent part of the ecosystem where they form the pioneer group. They are common in different forest types, damped areas, dry areas and other habitats. Though fundamentally terrestrial, few are aquatic like *Riccia fluitans*, *Ricciocarpus natans* and *Riella* spp. Species of *Cryptothallus* and *Buxbaumia* are saprophytic liverworts contrary to the autotrophic bryophytes.

*Bryum* Hedw., an acrocarpous species of Bryaceae. 21 species from seven northeastern states of the Himalayas such as Arunachal Pradesh, Assam, Manipur, Meghalaya, Nagaland, Sikkim and West Bengal were documented.<sup>[2]</sup> Out of the 21 species, *B. argenteum* var. *griffithii* (Muell. Hal.) Gangulee, *B. billardieri* Schwaegr., *B. pallescens* Schleich. ex Schwaegr., *B. pseudotriquetrum* (Hedw.) P. Gaertn., *B. Meyer* and Scherb., *B. pseudotriquetrum* var. *subrotundum* (Brid.) Gangulee and *B. reflexifolium* (Ochi) Ochi were recently reported from Meghalaya; *B. billardieri* Schwaegr. from Manipur, *B. apiculatum* Schwaegr., *B. caespiticium* Hedw. and *B. pseudotriquetrum* var. *subrotundum* (Brid.) Gangulee were new reports from West Bengal.

*Bryum* species are small to robust, with variable size and coloration, forming tufts, terrestrial or often epiphytic. The stem was a few millimetres to centimetres in size, mostly reddish brown, usually with many rhizoids. Cross Section reveals firm-walled cortical cells and developed or poor central strands of smaller thinner-walled cells. Leaves evenly spaced on stem or clustered and enlarged

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at stem apex (comose), erect or - escalate under damp environmental condition, rounded, elliptic, ovate or lanceolated, acute, acuminate, or rarely rounded at apex,  $\pm$  concave, not complanate, often with secondary pigments, toothed or entire, bordered, recurved or less often plane, sometimes decurrent; upper laminal cells hexagonal or rhombic-hexagonal, thin- or firm-walled, porose or not, becoming more oblong in lower leaf; marginal cells differentiated, linear, usually forming a strong or weak border. Costa strong, excurrent, percurrent or occasionally shorter, with a single abaxial stereid band. Brood bodies (gemmae, tubers, or bulbils) are recorded.

*Bryum* species are dioicous or monoicous. Perichaetia is apical on the main trunk or on mini lateral branches originating from the stem base, very often overtopped by subperichaetial innovations (seems lateral); perichaetial leaves are mostly moderately differentiated. Perigonia with multiple filiform paraphyses and antheridia. Setae elongate, flexuose to cygneous, one per perichaetium; capsules cernuous, pendent or rarely suberect, variable in form, mostly pyriform, clavate, cylindric, or rarely globose, well-developed neck, straight or curved; stomata numerous, superficial, and restricted to the neck; annulus well-formed and revolvable; operculum conic, sometimes apiculate. Peristome is double and often regular; exostome teeth yellowish-brown or pale, finely papillose below and mostly hyaline and baculate above, bordered, densely trabeculate on adaxial surface; endostome with thick basal sheath, well-developed, perforated or fenestrated segments, and with cilia in groups of 1–3, appendiculate, nodose, or occasionally reduced or absent. Calyptra cucullate, is smooth and the spores are spherical and nearly  $< 30 \mu\text{m}$  in size.

*Bryum* is one of the mega genus with multiple taxonomic issues among the moss category with a range of plasticity in morphological characters. Some estimates revealed 800 species<sup>[3]</sup> or even 1050 species.<sup>[4]</sup> Ochi estimated 180 or more species distributed globally,<sup>[5]</sup> while only 24 species were accepted in New Zealand. Ochi provided an ideal abstract for classification of the Bryaceae.<sup>[5]</sup>

Spenc attempted radical changes in the classification of *Bryum*.<sup>[6]</sup> Spence and Ramsay reassigned Australian species traditionally placed in *Bryum* into five genera while retaining five Australian species within a narrowly circumscribed *Bryum*.<sup>[7]</sup>

Generally, a highly-developed peristome in *Bryum* is referred to as a perfect category i.e., a double peristome with the following specialities such as 1. exostome teeth with a distinct median zig-zag abaxial visual line, finely papillose on the lower abaxial surface, mostly hyaline and baculate above, bordered, and densely

trabeculate adaxially; and 2. endostome arising from a thick basal sheath, with well-developed, keeled, and perforate segments, and appendiculate cilia in groups of 1–3. Thus, the perfect peristome (which is similar to that occurring in certain *Hypnum* spp. and their allied species) provides a reference point linked with the study of moss morphology. Characters of the peristome have historically been used in the construction of classifications of moss and recently it assumed a less significant, with the development of classifications based primarily on molecular features.

The variability of many *Bryum* species makes identification difficult especially if sterile. Vegetative features are used the possible way in key preparation of the species. Many of the species have distinct characters which facilitate their easy recognition. However, some of these features are difficult to incorporate into a conventional identification key. Thus, some *Bryum* collections were difficult to identify practically.

Many *Bryum* spp. possess rhizoidal tubers in the populations and these can often facilitate species recognition. Tuber morphology is of taxonomic significance in the differentiation of species included in the *B. erythrocarpum* complex. Tubers can be sparse, even in species reputed to bear them consistently. *B. erythrocarpum* complex *sensu* Crundwell and Nyholm is given under the discussion of *B. duriusculum*, which is the most widespread member of the complex.<sup>[8]</sup> Six species of the *B. erythrocarpum* complex are accepted which includes *B. duriusculum*, *B. radiculosum*, *B. ruderale*, *B. sauteri*, *B. rubens* and *B. tenuisetum*.

Although sharing features with other genera in Bryaceae or the Mniaceae (notably *Brachymenium* and *Poblia*), the genus *Bryum* usually is easily distinguished by its rhombic-hexagonal laminal cells, mostly percurrent or excurrent costae, usually bordered and recurved leaf margins, and often cernuous or pendent capsules. Plants belonging to *Poblia* generally have longer and narrower laminal cells and lack leaf borders, whereas *Brachymenium* is predominantly epiphytic and more robust and has erect capsules with highly reduced endostomes. Mostly, the key to *Bryum* species and its allied genera is based on the length of the largest stem leaves (including perichaetial leaves but excluding the excurrent portion of the costa) as follows: robust, leaves  $>4.0$  mm; large, leaves 3.0–4.0 mm; medium-sized, leaves 1.5–3.0; and small, leaves  $<1.5$  mm.

*Bryum affine* Lindb. and Arn. and *B. bimum* Scherb. have been used as a “dumping ground” for several disputed species from New Zealand. The correct application of these and other names associated with them has been the source of taxonomic and nomenclatural confusion

for some time.<sup>[4,9-11]</sup> The resolution of this taxonomic and nomenclatural tangle (also involving *B. creberrimum*, q.v.) is beyond the scope of the present review.

The name is *Bryum chrysonuron* Mull. Hal. was applied by several New Zealand workers (including Dixon, Sainsbury, Allison, and Linzey) to at least three tuber-bearing species (*B. duriusculum*, *B. sauteri*, and *B. clavatum*). Ochi attempted to refine the application of the name *B. chrysonuron* but was unable to locate the type material (collected by S. Mossman “ad flumen Wairoa-river prope portum Kaipara”).<sup>[12]</sup> The holotype was probably destroyed in the WWII burning of the Berlin herbarium. Efforts to locate potential type material for this name in other herbaria have failed. Given the lack of identifiable type material, and uncertainty surrounding the application of Müller’s name, *B. chrysonuron* is considered a nom. dub. and it is not applied in this work. A large proportion of the collections previously named *B. chrysonuron* are referable to *B. duriusculum*.

The highly variable *Bryum microerythrocarpum* Mull. Hal. and Kindb. is a Canadian type, common in the northern parts of the hemisphere, and is also recorded from New Zealand regions.<sup>[8]</sup> It is likely a later name for *B. duriusculum* Hook. f. and Wilson, which has a New Zealand type. The relationship between these two species is best examined in a monographic context and *B. microerythrocarpum* is not discussed further in this part. The name is *Bryum obconicum* Hornsch. was applied to New Zealand material by Hooker and Wilson.<sup>[13]</sup> That name has been applied to numerous collections in New Zealand herbaria that are referred to as *Rosulabryum capillare*. Syed considered much material named as *B. obconicum* Hornsch. to belong to *B. torquescens* Bruch.<sup>[14]</sup> In this treatment, *Bryum obconicum* is not accepted as a member of the New Zealand flora. In this scenario, an attempt was made in the *Bryum* species recorded from India (Table 1) and was compiled in the present study.

## MATERIALS AND METHODS

The method used for the study was a combination of field, herbarium record analysis and literature review related to the species.

### Primary Data Collection

Data about *Bryum* species was obtained from a field study in various districts of Kerala and Tamil Nadu.

### Secondary Data Collection

Survey of available literature from online and offline modes about *Bryum* species. Also referred to various resources such as ENVIS Hub: Kerala, India Biodiversity

Portal, British Bryological Society etc. Similarly, the herbarium collections available across Southern parts of India were also checked to validate the species name recorded.

## RESULTS AND DISCUSSION

‘Hortus Indicus Malabaricus’ by Henricus van Rheede was the first report of bryophyte resources from the Western Ghats. He described the moss as ‘poempeda’, the commonest species of mosses from South India, later renamed as *Bryum coronatum* Schwagr., by Robinson.<sup>[2]</sup> Gangulee<sup>[43]</sup> made valuable contributions to the genus *Bryum*. He described twenty-two species of *Bryum* from Eastern and adjacent regions of India. In his report, Sikkim has high diversity which is 12 taxa followed by 9 species from Darjeeling. The lowest number of species was from Arunachal Pradesh and Assam i.e., with 2 taxa each. Dandotiya *et al.*,<sup>[33]</sup> contributed data about Indian *Bryum* species in his ‘A checklist of the bryophytes of India’. Which included 45 *Bryum* species from various Indian states. Among which highest number of taxa was listed from eastern Himalayas (26 numbers). Barukial reported 4 species from Assam.<sup>[45]</sup> First report of *B. argenteum* from Nagaland was done by Bansal and Nath.<sup>[46]</sup> They also reported *B. bessonii* from Eastern Himalayas and *B. coronatum* from Meghalaya for the first time.<sup>[46]</sup>

Pradhan and Joshi<sup>[47]</sup> recorded 39 *Bryum* species from Nepal. Rawat *et al.*, surveyed Mosses (Bryophyta) of Gangetic Plains, India<sup>[48]</sup> and revealed only 3 species of *Bryum* only. Sameer Ahmad Thoker and Sapan Patel reported 5 species from Jammu and Kashmir,<sup>[49]</sup> Afroz Alam *et al.*, documented 15 species of *Bryum* from Central India.<sup>[17]</sup> *Bryum* occurs even in the cold desert of Leh Ladakh.<sup>[50]</sup> 4 species were reported by Anshul *et al.*, from Ladakh. The checklist of the mosses of Karnataka by Frahm *et al.*, reported 10 species.<sup>[18]</sup> 26 taxa of the genus were documented from the 4 states of Peninsular India<sup>[15]</sup> (Karnataka, Kerala, Maharashtra, Tamil Nadu) and Goa of Western Ghats, whereas 8 species were reported from Andhra Pradesh, parts of Odisha and Tamil Nadu of Eastern Ghats by Bansal and Virendra Nath (2014).<sup>[15]</sup> Only two species were recorded such as *B. argenteum* and *B. wightii* from Aralam Wildlife Sanctuary of the Western Ghats by Manju *et al.*,<sup>[51]</sup> In Kerala, more species were reported from Idukki by Suman,<sup>[52]</sup> Joshi<sup>[35]</sup> (reported 8 species), and Wayanad by Manju *et al.*,<sup>[53]</sup>

## CONCLUSION

Bryophytes represent ecologically unique amphibians with high diversity in various ecological habitats. The

Table 1: *Bryum* species in India.

Sl. No	Binomial	Specimens examined	Location
1	<i>Bryum alpinum</i> Huds. ex With. Syst. Arr. Brit. Pl. (ed. 4) 3: 824. 1801. <sup>[15-16,20,30-31,33]</sup> Habitat: Grows on wet soil and rock	Western Ghats: Kerala: Vattakkayam, Kakkayam, Kozhikode, alt. 1050 m, on rocky patch, Coll.: Manju and K.P. Rejesh 120180 (CAL) <sup>[15]</sup>	Western Ghats: Kerala-Kozhikode; Maharashtra-Kasara (Thal Ghat), Khandala, Mahabaleshwar; Tamil Nadu-Nilgiri hills, Palni hills South India
2	<i>Bryum ambiguum</i> Duby. Die Musci der Flora von Buitenzorg 2: 544. 1904. <sup>[17]</sup>		
3	<i>Bryum apalodictyoides</i> Mull. Hal., Bot. Zeitung (Berlin) 11: 21. 1853. <sup>[15,18-19,33,42]</sup>	Western Ghats: Karnataka: Herb. Walker, near Hatur, Coorg, India, on dry exposed rocks in bamboo jungle, Coll.: T.L. Walker 189, Det.: V.F. Brotherus (FH); Herb. Walker, near Nalknad Palace, Coorg, India, on tree trunks, Mar. 1898, Coll.: T.L. Walker 326, Det.: V.F. Brotherus (FH); Bryophytes of Western India, Union of India, Bombay State, Satara district, Mahabaleshwar, near the summit of the Western Ghats, altitude about 4500 feet, 17°55' N, 73°40' E, stone wall, Coll.: Hale H. Cook, Det.: H.A. Gleason, Jr. (FH 15, 16).	Western Ghats: Karnataka-Kodagu (Hatur, Nalknad Palace); Kerala-Palakkad (Silent Valley); Maharashtra-Mahabaleshwar; Tamil Nadu-Kodaikanal (Tiger Chola), Nilgiri hills, Palni hills Eastern Himalayas
4	<i>Bryum apiculatum</i> Schwaeagr., Sp. Musc. Frond., Suppl. 1(2): 102. f. 72. 1816. <sup>[15,31,33,42]</sup> Habitat, Terrestrial	Western Ghats: Kerala: Muthanga range, Wayanad WLS, alt. 878 m, Coll.: Manju 84510 (CAL); Tamil Nadu: Sea field, Kanyakumari, 820 m, Coll.: A.E.D. Daniels and J.L. Mabel (AEDD 450); Natchur, Palni hills, Coll.: Foreau 553a Det.: H.N. Dixon (FH). Deccan Plateau and Eastern Ghats: Andhra Pradesh: University of Toronto Herbarium, Flora of India-Herb. Walker, Jeypore Taluq, Vizagapatam, Coll.: T.L. Walker 535, 554 Det.: H.N. Dixon (FH).	Western Ghats: Karnataka-Agumbe (Hulical Ranges); Kerala-Wayanad; Maharashtra-Khandala, Lonavala, Mahabaleshwar, Purandar Fort; Tamil Nadu-Kanyakumari, Nilgiri hills (Udhagamandalam-Naduvattam), Palni hills; Deccan Plateau and Eastern Ghats: Andhra Pradesh-Guntur, Vishakapatnam; Odisha-Koraput, Puri; Tamil Nadu-Sheravoy hills, Himalayas, African countries
5	<i>Bryum argenteum</i> Hedw., Sp. Musc. Frond. 181. 1801. <sup>[15,20-21,30,33,42]</sup> Characterized by the smaller size, the leaf tips curved outside and the occurrence in natural habitats, such as soil in open grassland. In contrast, the much 'fatter' <i>B. argenteum</i> var. <i>argenteum</i> with straight leaf apices is a nitrophilous species from urban habitats.	Western Ghats: Karnataka: Herb. Walker, Hatur, Coorg, Coll.: T.L. Walker 193, Det.: V.F. Brotherus (FH); Kerala: Idukki district, Marthoma Campus, Munnar, Leg.: V. Nath 247681, 247682B (LWG); Marthoma Campus, Munnar, grows on bricks, Leg.: V. Nath 247683A (LWG); Thirunelli Reserve Forest, Wayanad, alt. 1180 m, grows on land cuttings, Coll.: Manju (CAL 99625); Tamil Nadu: Narakkad, Tirunelveli, alt. 1000 m, saxicolous, Coll.: A.E.D. Daniels (AEDD 76); Herbarium of Edwin B. Bartram, Herbier Charmier, Indes Owglaises, Kodaikanal, 8 mai 1912, Leg.: R.P. Foreau (FH); Perumal, May 1923, Coll.: G.F. Foreau (FH); Herb. Edwin B. Bartram, Flora of South India, Nilgiri hills, Coll.: C. Srinivasan 143, Det.: E.B. Bartram (FH); St. Xavier's College, Palamcottah, Palney hills, alt. 6000 ft, Coll.: G.F. Foreau (FH); Beschi College Herb., Shembaganur, Palni hills, Kodaikanal, alt. 7000 ft, Coll.: G.F. Foreau 16 (FH). Sp. Musc. Frond. 181, 1801. Central India (without any locality as <i>B. argenteum</i> var. <i>lanatum</i> ) Gujarat: Girmar hill, Pavagarh, Sabarkantha forest, Saputara. <sup>[26]</sup> Madhya Pradesh: Bhopal Pachmarhi. <sup>[29]</sup> Rajasthan: Mount Abu <sup>[25,27-28]</sup> Kumbhalgarh, Udaipur. <sup>[23,25]</sup>	Western Ghats: Karnataka-Agumbe (Hulical Ranges); Kerala-Chinnar Wildlife Sanctuary, Eravikulam National Park, Idukki, Wayanad; Maharashtra-Kasara (Thal Ghat), Khandala, Mahabaleshwar; Panchgani; Tamil Nadu-Anamalais, Kodaikanal, Nilgiri hills (Udhagamandalam), Palni hills; Deccan Plateau and Eastern Ghats: Odisha-Koraput; Tamil Nadu-Sheravoy hills, China, Japan, Malaysia, Papua New Guinea, Philippines, Taiwan, Thailand, Vietnam, Madagascar, America, Africa and Europe
5a	<i>B. argenteum</i> var. <i>argenteum</i> <sup>[33]</sup>		Nilgiri hills

continued...



Table 1: Cont'd.

Sl. No	Binomial	Specimens examined	Location
5b	<i>Bryum argenteum</i> var. <i>griffithii</i> (C. Muell.) Gangulee. <sup>[31,33]</sup> Habitat: cement wall/ rock	INDIA, Meghalaya: Shillong: Lum Nehru Park, Umiam, alt. c. 1014 m., grows on stony wall, Leg.: V. Sahu and V. Awasthi, 251557 (LWG)	Assam, Manipur, Meghalaya.
5c	<i>Bryum argenteum</i> var. <i>lanatum</i> (P. Beauv.) Hamp. <sup>[33]</sup> Habitat: cement, brick wall, soil	Sikkim, Darjeeling, Arunachal Pradesh, Khasia hills, W. Himalaya, Kashmir, Manipur, W. Ghats, Nilgiri, Palni	Sikkim, Darjeeling, Arunachal Pradesh, Khasia hills, Orissa hills, W. Himalaya, Kashmir, Manipur, W. Ghats, Nilgiri, Palni
6	<i>Bryum atrovirens</i> Brid., Muscol. Recent. 2(3): 48 1803. <sup>[31,33]</sup> Habitat: Terricolous; on soil	On way to Hemkund, alt. ca 3343 m, Leg.: S. Chandra 200872G, 200893C (LWG).	Assam, Manipur, Sikkim, Kumaon, Mussoorie
7	<i>Bryum auratum</i> Mitt. J. Proc. Linn. Soc., Bot., Suppl., 1: 67, 67, 1859. <sup>[36]</sup> Habitat: Wet rocks	Munnar	Idukki
8	<i>Bryum badhwari</i> Ochi. <sup>[33,37-38]</sup> Habitat: soil	Kedarnath Wildlife Sanctuary (KWLS), Garhwal Himalaya. <sup>[36]</sup>	Western Himalaya, Manipur and Eastern Himalayas
9	<i>Bryum bessonii</i> Ren. and Card., Suppl. Prodr. Fl. Bryol. Madag. 59. 1909. <sup>[15,31]</sup> Rupicolous; on stony wall	Dehra Dun district, Mussoorie, Company Garden, alt. ca 1945 m, Leg.: V. Nath and party 228205C (LWG).	Western Ghats: Goa-Rivona and Zambaulim; Tamil Nadu-Kodaikanal (Shenbaganur), Palni hills. Uttarakhand: Garhwal hills - Mussoorie; Kumaon hills - Nainital, Pithoragarh
10	<i>Bryum bicolor</i> Dicks. Fasciculus Plantarum Cryptogamicarum Britanniae 4: 16. 1801. <sup>[33]</sup>		Sikkim, Darjeeling, W. Himalaya, Kumaon, Nainital
11	<i>Bryum billardieri</i> Schwaegr., Sp. Musc. Frond. Suppl. 1(2): 115. 1816. <sup>[15,31,33]</sup> Habitat: Common on humic soil and earth covered rocks in forests at all elevations	Western Ghats: Karnataka: <i>B. ramosum</i> (Hook.) Mitt., Herb. Walker, near Verajpet, Coorg, dry clay banks, Coll.: T.L. Walker 290. Det.: V.F. Brotherus (FH); KERALA: near Eravikulam Hut, Eravikulam NP, Munnar, Idukki, alt. 1975 m, epiphytic on <i>Cupressus</i> associated with Lichen and <i>Drymoglossum</i> , Coll.: Manju 76053a (CAL); Shendurney Wildlife Sanctuary, Kollam W. Ghats, 560 m, rupicolous, 04.11.2008, Coll.: R. Felix (AEDD 245). Tamil Nadu: Himalayan Mosses, Ootacamund, 7500 ft, on soil, Coll.: H. Gangulee, Det.: E.B. Bartram (FH 3156); Ex Rijksherbarium, Leiden, Nilgiris, Naduvattam, along road from Utacamund to Gudalur, on tree trunk, ca 2000 m, Leg.: A.J.G.H. Kostermans 4 (FH); Herbier Charrier, Indes Owglaises, Kodaikanal, Leg.: R.P. Foreau (FH); Perumal, Leg.: G.F. Foreau (FH); St. Xavier's College, Palamcottah, Palney hills, 5600 ft., 1929, Coll.: G.F. Foreau (FH); Mosses of Southern India, Madras State, Madura district, Palni hills, Kodaikanal and surrounding region, Shembaganur, Tiger Shola, alt. ca 5600 ft, Leg.: G. Foreau 184, Residue of "Musci Madurenses Indiae Meridionalis Exsiccati", issued by Georges Foreau, S.J., distributed by The New York Botanical Garden (FH); Herb. Of Edwin B. Bartram, Herbier Charrier, Indes Owglaises, Tiger Shola, Gubey hills, Leg.: R.P. Foreau (FH).	Western Ghats: Karnataka-Kodagu (Verajpet, Ponnampet); Kerala-Eravikulam National Park, Idukki, Shendurney Wildlife Sanctuary; Tamil Nadu-Kodaikanal (Law's Ghat road, Shenbaganur and Tiger Chola), Madurai, Nilgiri hills (Udhagamandalam-Naduvattam), Palni hills, Perumal

continued...

Table 1: Cont'd.

Sl. No	Binomial	Specimens examined	Location
12	<i>Bryum bornholmense</i> Wink. and R. Ruthe Hedwigia, 38 (Beibl. 3): 120, 120, 1899 <sup>[36]</sup>	Bikaner <sup>[25]</sup>	Rajasthan
13	<i>Bryum bryoides</i> (R. Br.) Angstrom <sup>[17]</sup>		Western Himalayas
14	<i>Bryum caespitium</i> Hedw., Sp. Musc. Frond. 180. 1801. <sup>[15,21,31]</sup> Habitat: brick wall	Madhya Pradesh: Raisen - Bhimbetka. <sup>[22]</sup> Mandla- Kanha National Park. <sup>[19]</sup> <i>Bryum capillare</i> Hedw., Sp. Musc. Frond. 182. <i>Ptychostomum capillare</i> (Hedw.) D. T. Holyoak and N. Pederson	Western Ghats: Tamil Nadu-Kanyakumari, Tirunelveli Madhya Pradesh
15	<i>Bryum capillare</i> Hedw., Sp. Musc. Frond., 182. 1801. <sup>[15,20,31,33,34,42]</sup> Habitat: On damp soil or on small rocks in semi shaded areas of semi-evergreen forests	Western Ghats: Kerala: Idukki district, Meshirishola, Eravikulam NP, Munnar, alt. 2000 m, grows on rocky patch, Coll.: Manju 80218 (CAL); TAMIL NADU: Kanyakumari, Sea field, 820 m, terricolous, Coll.: A.E.D. Daniels and J.L. Mabel (AEDD 416) <sup>[30]</sup> p; GOA: Keri Surfa (Border of Goa-Karnataka), corticolous, Coll.: Sulabha Phatak (LWG 552, 558).	Western Ghats: Goa-Keri Surfa; Kerala-Eravikulam National Park, Idukki, Munnar, Wayanad; Tamil Nadu-Kanyakumari, Palni hills, Nilgiri hills (Udhagamandalam-Naduvattam), Tirunelveli; Deccan Plateau and Eastern Ghats: Andhra Pradesh-Guntur; Tamil Nadu-Sheravoy hills. Gujarat China, Thailand, Vietnam, Taiwan, Korea, Japan, Siberia, Central Asia, Europe, North and Central Africa, North and South America, Australia and New Zealand
16	<i>Bryum cellulare</i> Hook. in Schwaeagr. Sp. Musc. Frond., Suppl. 3(1): 214. 1827. <sup>[15,20,31,33,34,42]</sup> Habitat: On soil cuttings along with other mosses in semi-evergreen forests	Western Ghats: Kerala: Palakkad district, Parambikulam WLS, alt. 1100 m, grows on rocky patch, Coll.: Manju 106823 (CAL). Gujarat: Pavgarh, Saputara, Waghai Botanical Garden <sup>[26]</sup> Rajasthan: Mount Abu. <sup>[25]</sup>	Western Ghats: Kerala-Kakkavayal Reserve Forest, Parambikulam Tiger Reserve, Wayanad; Tamil Nadu-Nilgiri hills (Doddabetta), Palni hills (Gundar Shola); Deccan Plateau and Eastern Ghats: Andhra Pradesh-Guntur Western Himalayas, Gujarat Myanmar, China, Japan, Sumatra, Java, Philippines, Taiwan, Europe, North and Central Africa and Australia
17	<i>Bryum clavatum</i> (Schimp.) Mull. Hal., Sp. Musc. Frond., 1: 292. 1848 <sup>[31]</sup>	Garhwal hills in Uttarakhand	Uttarakhand: Garhwal hills - Arnigadh, near Mussoorie
18	<i>Bryum constricta</i> <sup>[33]</sup>		Kumaon, Shimla, Mussoorie, Nainital, Purnjab, Darjeeling, Sikkim, Rajasthan, Gujarat
19	<i>Bryum coronatum</i> Schwaeagr., Sp. Musc. Frond., Suppl. 1(2): 103. 71. 1816. <sup>[20,31,32,34]</sup> Habitat: On calcareous soils or walls and also on rocks along with <i>Funaria hygrometrica</i> and <i>Hyophila involuta</i> in homesteads and in semi-evergreen forests. Distribution: It is common throughout the study area, mostly in the mid altitudinal range from 500-800 m	Western Ghats: Karnataka: Shimoga, Agumbe, alt. ca 600 m, grows on soil, Leg.: S. Chandra and V. Nath 204124 (LWG); Bryothea Elevier, S.W. Brit India, Mangalur (South Canara), Aug. 1906, Leg.: Rev. J. Pfeiderer 6821, Det.: V.F. Brotherus (FH); Herb. Walker, dry clay ground at Pollebetta, South Coorg, India, Coll.: T.L. Walker 215, Det.: V.F. Brotherus (FH); Herb. Walker, logs in Bamboo jungle-Ponnapet in South Coorg, India, Coll.: T.L. Walker 238, Det.: V.F. Brotherus (FH); Kerala: MG University campus, Kottayam, alt. 40 m, grows on brick wall, Coll.: K.P. Rajesh 120380 (CAL); GOA: Margao, Lithophyte, on laterite walls, Coll.: Mini N. Vijayan (LWG 8); Tamil Nadu: Sea field, Kanyakumari, 820 m, saxicolous, Coll.: A.E.D. Daniels and J.L. Mabel (AEDD 472). Deccan Plateau and Eastern Ghats: University of Toronto Herbarium, Flora of India-Herb. Walker, Jeypore Taluq, Vizagapatam, 2000-4500 ft, Coll.: T.L. Walker 525, 541, 563, 575, Det.: H.N. Dixon (FH); Himalayan mosses, near Cuttack, 29.X.58, Coll.: H.C. Gargulee 3115, Det. E.B. Bartram (FH). Gujarat Pavagarh, Saputara, Waghai Botanical Garden <sup>[26]</sup> Madhya Pradesh: Bhopal Pachmarhi <sup>[29]</sup> Mandla: Kanha National Park <sup>[19]</sup> Rajasthan: Kumbhalgarh. <sup>[23,25]</sup>	Western Ghats: Goa-Margao, Rivona, Zambaulim; Karnataka-Kodagu, Mangalur (South Canara), Agumbe (Hulical Ranges, Kanagaludda); Kerala-Eravikulam National Park, Idukki, Wayanad; Maharashtra-Kasara (Thal Ghat) Khandala, Mahabaleshwar, Pune; Tamil Nadu-Kanyakumari, Maramalalai, Mundanthurai, Tirunelveli; Deccan Plateau and Eastern Ghats: Andhra Pradesh-Vishakhapatnam; Odisha-Cuttack, Koraput, Puri. Gujarat China, Borneo, Philippines, Thailand, Brazil, Bolivia, Peru and Mexico

continued...

Table 1: Cont'd.

Sl. No	Binomial	Specimens examined	Location
20	<i>Bryum dichotomum</i> Hedw., Sp. Musc. Frond. 183. 1801. <sup>[15,31,42]</sup> Habitat: On land cuttings	Mussoorie, alt. ca 2136 m, x 86-119 µm, Leg.: V. Sahu 251452 (LWG)	Western Ghats: Kerala. Uttarakhand: Garhwal hills Mussoorie; Kumaon hills - Nainital, Pithoragarh
21	<i>Bryum dunense</i> A.J.E. Sm. and H. Whitehouse, J. Bryol. 10:41, 1978. <sup>[21]</sup>	Kumbhalgarh, <sup>[23-24]</sup> Mount Abu <sup>[25]</sup>	Rajasthan
22	<i>Bryum eurphyllum</i> Dix. and P. Vard., Archives de Botanique, Bulletin Mensuel 1(8-9): 170. 1927. <sup>[15,33]</sup>		Western Ghats: Karnataka, Kerala.
23	<i>Bryum flaccum</i> Wilson ex Mitt. J. Proc. Linn. Soc., Bot., Suppl., 1: 72, 72, 1859 <sup>[33]</sup>		Sikkim Eastern Himalayas
24	<i>Bryum ghatense</i> Broth. et Dix. <sup>[20]</sup> Habitat: Grows on moist wall	Lonavala and Mahabaleshwar Sedgwick and Dabhade	Maharashtra Sahyadri Hills)
25	<i>Bryum haematoneurum</i> Müll. Hal., Nuovo Giorn. Bot. Ital. 4: 17. 17. 1872. <sup>[15]</sup>		Maharashtra-Purandhar Fort
26	<i>Bryum intermedium</i> (Brid.) Bland. <sup>[37]</sup> Habitat: grows on cement wall	Keishampat	Manipur
27	<i>Bryum kashmirensis</i> Broth., Acta Soc. Sci. Fenn. 24(2): 24. 24. 1899. <sup>[15]</sup>		Western Ghats: Kerala.
28	<i>Bryum kinggraeffii</i> Schimp., Hoh. Crypt. Preuss. 81, 1858. <sup>[21,33]</sup>		Rajasthan: Udaipur Gangetic plains
29	<i>Bryum lamprostegum</i> Müll. Hal. Bot. Zeitung (Berlin) 11: 22. 1853. <sup>[15,33]</sup>		Western Ghats: Tamil Nadu-Nilgiri hills.
30	<i>Bryum laxelimbatum</i> Hampe ex Ochi J. Jap. Bot., 43: 112, 112, 1968 <sup>[33]</sup>		Kumaon
31	<i>Bryum madurensis</i> (Dix. and P. Vard.) Ochi, J. Hattori Bot. Lab. 35: 67. 1972. <sup>[15]</sup>		Western Ghats: Tamil Nadu-Madurai, Upper Palni hills
32	<i>Bryum medianum</i> Mitt J. Proc. Linn. Soc., Bot., Suppl., 1: 74, 1859 <sup>[43,54]</sup> Habitat: Moist soil	Coorg; Ponnappet. Nepal and South India	Karnataka, Nepal
33	<i>Bryum mildeanum</i> Jur. Verh. <i>Bryum mildeanum</i> Jur., Verh. Zool.-Bot. Ges. Wien 12: 967. 1862. <i>Bryum apiculatum</i> Schwaegr. Sp. Musc. Frond., suppl. 1, 2: 102. 1816. <sup>[21]</sup>	Zool.-Bot. Ges. Wien Gangetic plains	Rajasthan:Kumbhalgarh wildlife sanctuary,Mount Abu (Bansal and Nath represent as <i>Bryum apiculatum</i> ). <sup>[25]</sup>

continued...

Table 1: Cont'd.

Sl. No	Binomial	Specimens examined	Location
34	<i>Bryum neelgherense</i> Mont. Syn. Musc. Frond., 1: 255, 255, 1848 <sup>[33]</sup>	This species is related to <i>B. billardieri</i> but has filamentous gemmae in the leaf axils. It was collected once in Honey Valley. Walker collected the species in Coorg on dry clay banks near Virajpet [as <i>B. ramosum</i> (Harv.) Mitt.]. The species is treated in the <i>B. billardieri</i> complex <sup>[40]</sup> as well in the <i>B. wightii</i> complex <sup>[41]</sup> but seems to be related to <i>B. billardieri</i> in the same way as <i>Bryum moravicum</i> Posp. and <i>B. capillare</i> Hedw. in Europe.	Karnataka
35	<i>Bryum pachycladum</i> Cardot ex Potier de la Varde, 1925 Rev. Bryol., 52: 38, 38, 1925 <sup>[33]</sup>		Kodaikanal
36	<i>Bryum pachythea</i> Müll. Hal., Syn. Musc. Frond. 1: 307. 1848. <sup>[16]</sup>	Western Ghats: Kerala: Malappuram Dist., Calicut University Campus, alt. ca 40 m, grows on rocky wall, Coll.: <i>Manju</i> 87001 (CAL).	Western Ghats: Kerala-Calicut University Campus Kodaikanal
37	<i>Bryum pallescens</i> Schleich. ex Schwaegr., Sp. Musc. Frond., Suppl. 1(2): 107. 75. 1816. <sup>[31]</sup> Habitat: Terricolous; on soil in association with other moss species	Dehra Dun, Chakrata, Janglat Chowki-Deoban, alt. ca 2865 m, Leg.: S. 12. Chandra 202852 (LWG).	Uttarakhand: Garhwal hills - Chakrata, Dehra Dun, Mussoorie, Deoban; Kurmaun hills - Nainital.
38	<i>Bryum paradoxum</i> Schwaegr., Sp. Musc. Frond., Suppl. 3, 1(1): 224a. 1827. <sup>[15,20,21,31,33,41]</sup> Habitat: Terricolous.	Western Ghats: Kerala: Kattumala, Eravikulam NP, Munnar, Idukki, alt. 2100 m, grows on rocky patch where water drips regularly, Coll.: <i>Manju</i> 80224 (CAL); TAMIL NADU: Herbarium of Edwin B. Bartram, Herbar Charrier, Indes Owinglaises, Kodaikanal, 1912. Leg.: <i>R.P. Foreau</i> (FH); St. Xavier's College, Palamcottah, Palney hills, alt. 7000 ft, Coll.: <i>G.F. Foreau</i> (FH); Perumal, Leg.: <i>G.F. Foreau</i> (FH); Mosses of Southern India, India, Madras State, Madura district, Palni hills, Kodaikanal and surrounding region, Shembaganur, Leg.: G. Foreau, Residue of "Musci Madurenses Indiae Meridionalis Exsiccati", issued by Georges Foreau, S.J. distributed by The New York Botanical Garden (FH); Madras State, Madura district, Palni hills, Kodaikanal and surrounding region, Lower Palni hills, Perumalmalai Shola, Residue of "Musci Madurenses Indiae Meridionalis Exsiccati", issued by Georges Foreau, S.J., Distributed by the New York Botanical Garden, Leg.: G. Foreau (TNS 051340). Gujarat: Saputara. <sup>[26]</sup> Madhya Pradesh: Mandla: Kanha National Park <sup>[19]</sup> Rajasthan: Mount Abu <sup>[15,26-27]</sup>	Western Ghats: Karnataka-Mysoore, Nandi hills; Kerala-Agasthyamalai Biosphere Reserve, Eravikulam National Park; Maharisintra-Purandhar Fort; Tamil Nadu-Agasthyamalai Biosphere Reserve, Kodaikanal (Law's Ghat road, Shembaganur), Madurai, Nilgiri hills, Palni hills. Assam, Meghalaya. Gujara <sup>[34]</sup>
39	<i>Bryum plumosum</i> Dozy. and Molk., Ann. Sci. Nat. Bot. Ser. 3, 3(2): 301. 1844. <sup>[33,42]</sup> Habitat: On earth cuttings in moist deciduous forests. New Caledonia		Recorded from India (Kerala, Assam, Calcutta, Orissa, Western Himalaya), Sri Lanka, China, Japan, Sumatra, Java, Celebes, Borneo, Philippines, Taiwan, Australia
40	<i>Bryum porphyroneuron</i> var. <i>erythrinum</i> (Mitt.) M. Fleisch. Die Nätürlichen Pflanzenfamilien I (3): 590. 1904. <sup>[2,1,33]</sup>		Madhya Pradesh: Raisen: Bhimbetka, Pachmarhi
41	<i>Bryum pseudotriquetrum</i> (Hedw.) P. Gaertn., B. Mey. et Scherb., Oekon. Fl. Wetterau 3(2): 102. 1802. <sup>[15,21,31,33]</sup> Habitat: Rupicolous;	On way to Taluka from Sankri regions, Uttarkashi, alt. ca 1998 m, Leg.: A.K. Asthana 252429B (LWG).	Western Ghats: Kerala-Eravikulam National Park, Wayanad. Rajasthan: Mount Abu <sup>[15]</sup>

continued...



Table 1: Cont'd.

Sl. No	Binomial	Specimens examined	Location
42	<i>Bryum pseudotriquetrum</i> var. <i>subrotundum</i> (Brid.) Gangulee, Mosses E. India, 4: 994. 1974. [15,31,33] Habitat: Rupicolous	Dehra Dun, Mussoorie, Lal Tibba route, alt. ca 2370 m, Leg.: V. Nath	Western Ghats: Tamil Nadu-Nilgiri hills (Doddabetta). Uttarakhand: Mussoorie. Garhwal hills –
43	<i>Bryum recurvulum</i> Mitt., J. Proc. Linn. Soc., Bot., Supp.: 1:74, 1859. [20,21,31,33]	Herbarium of Edwin B. Bartram, Herbar Charrier, Himalaya, Indes Owglaises, N.W.: Himalaya, Mussoorie (FH).	Gujarat: border area with Rajasthan without specific locality. [26]
44	<i>Bryum reflexifolium</i> (Ochi) Ochi in Ohashi, Bull. Univ. Museum, Univ. Tokyo N. 8: 261. 1975. Habitat: Saxicolous <sup>[31]</sup>	INDIA, Meghalaya: East Khasi Hills: Shillong, on way to Jowai, alt. c. 1287 m, grows on rock, Leg.: V. Sahu and V. Awasthi, 251689B (LWG); West Bengal: Darjeeling, Tiger hill, alt. c. 2545 m, grows on soil covered rock, Leg.: A.K. Asthana and V. Sahu, 224073E (LWG); on way to Tonglu, alt. c. 2576 m, grows on rock, Leg.: A.K. Asthana and V. Sahu, 224354 (LWG).	Meghalaya, Sikkim, West Bengal.
45	<i>Bryum retusifolium</i> Card. and Varde, Rev. Bryol. 50: 20. 1923. Foreau (FH 1835). [15,31,33] Habitat: Rupicolous; on rocks	Specimens examined: WESTERN GHATS: TAMILNADU: St. Xavier's College, Palamcottah, Palney hills, 7000 ft, Coll.: G.F. (FH 1929); Herbarium of Edwin B. Bartram, Herbar Charrier, Indes Owglaises, Perumal, Leg.: R.P. Uttarkashi district, on way to Taluka from Sankri, alt. ca 1998 m, Leg.: diameter. A.K. Asthana 252429D (LWG).	Western Ghats: Tamil Nadu-Kodaikanal, Madurai, Palni hills. Uttarakhand: Garhwal hills - Uttarkashi.
46	<i>Bryum rubens</i> Mitt., In Hooker's J. Bot. Kew Gard. Misc.8: 232, 1856. [21,31]	Rajasthan: Mount Abu (Bansal and Nath, 2014). [25]	Rajasthan
47	<i>Bryum salakense</i> Card., Annuaire Conserv. Jard. Bot. Genève, 15-16: 166. 1912. [15] Habitat: Epiphytic	WESTERN GHATS: KERALA: Wayanad, Pakshipadalam, alt. ca 1100 m, Coll.: K.P. Rajesh 99750 (CAL).	Western Ghats: Kerala-Wayanad; Deccan Plateau and Eastern Ghats: Tamil Nadu-Sherwaroy hills
48	<i>Bryum srilankense</i> Mohamed J. Bryol., 12: 25. f. 2, 25, 1982 [18]	Coorg: damp earth near Naiknad Palace, T.L. Walker 329 (H)	Karnataka
49	<i>Bryum teretiusculum</i> Hook. ex Harv. Icones Plantarum 1: pl. 20, f. 1. 1836. [33]	Uttarakhand: Garhwal hills - Vishnuprayag, Kumaun hills - Nainital. Rajasthan: Mount Abu	Uttar Pradesh (Tehri), Mussoorie, Assam, Khasia hills
50	<i>Bryum truncorum</i> (Brid.) Brid. [33]		Kerala
51	<i>Bryum tuberosum</i> Mohamed and Damanhuri, Bryologist 93(3): 288. 1990. [42] Habitat: On rocky patches		Kerala, Karnataka, Malaysia
52	<i>Bryum thomsonii</i> Mitt., Jour. Proc. Linn. Soc., Bot., Suppl. 1: 73. 1859. [15,21,31] Habitat: Terricolous.	Uttarakhand: Garhwal hills - Mussoorie, Tehri	Western Ghats: Karnataka-Kodagu; Tamil Nadu-Nilgiri hills; Deccan Plateau and Eastern Ghats: Andhra Pradesh-Guntur, Visakhapatnam
53	<i>Bryum tuberosum</i> Mohamed and Damanhuri, Bryologist 93(3): 288. 1990. [15] On rocky patch	Western Ghats: Karnataka: Shimoga Dist., Agumbe, alt. ca 600 m, grows on walls and rocks, Leg.: S. Chandra and V. Nath 204116B (LWG); Kerala: Wayanad, Hairpin area, alt. 750 m, on rocky patch, Coll.: Manju 80093 (CAL).	Western Ghats: Karnataka-Agumbe, Uduppi; Kerala-Wayanad
54	<i>Bryum turbinatum</i> (Hedw.) Turm. Muscol. Hibern. Spic. 127. 1804 [31] Habitat: Rupicolous	Uttarakhand: Garhwal hills - Mussoorie, Tehri	Karnataka, Malaysia Western Himalayas Uttarakhand: Garhwal hills - Tehri.

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Table 1: Cont'd.

Sl. No	Binomial	Specimens examined	Location
55	<i>Bryum uliginosum</i> (Brid.) Bruch, Schimper and W. Gümbel in Bryol. Eur. 4: 88, 1839 <sup>[20-21,31,33]</sup> Habitat: Corticolous, Terricolous;	Chamoli Dist., Valley of Flowers, alt. ca 3510 m, Leg.: S. Chandra 200812C (LWG); on way to Hemk. Leg.: S. Chandra 200922B (LWG)und, alt. ca 3343 m, RAJASTHAN: Mount Abu <sup>[25,27]</sup>	Western Ghats: Kerala; Tamil Nadu-Nilgiri hills (Udhagamandalam-Naduvattam).
56	<i>Bryum wegeii</i> Spreng. Mant. Prim. Fl. Habs. 55, 1807 <sup>[91]</sup> Habitat: Terricolous	Uttarakhand: Garhwal hills - Satopanth glacial bed.	Western Himalayas
57	<i>Bryum wightii</i> Mitt., J. Proc. Linn. Soc., Bot., Suppl. 1: 74, 1859. <sup>[15,20-21,33,42,44]</sup> Grows moderately at high altitude regions, near wet areas such as waterfalls, often on moist rocky substratum, mostly associated with <i>Utricularia</i> sp. and <i>Campylopus</i> sp. in semi-evergreen, evergreen, shola forests and in grasslands	Western Ghats: Goa: Keri Surfa (Border of Goa-Karnataka), Terricolous, Coll.: <i>Sulabha Phatak</i> (LWG 564); Karnataka: Herb. Walker, by small spring at the foot of a cliff of gneiss, Mercara, Coorg, India, Coll.: T.L. Walker 280, Det.: V.F. Brotherus (FH); Herb. Walker, damp earth near Nalknad Palace, Coorg, India, Coll.: T.L. Walker 329, Det.: V.F. Brotherus (FH); Kerala: Idukkeri, near Devikolam, alt. ca 1800 m, grows on bark of tree, Leg.: D.K. Upreti 204009 (LWG); Munnar, Devikolam, alt. ca 1590 m, on water logged rocks, Leg.: V. Nath 248401 (LWG); Wayanad Dist., Manikkunnumala, near MSSRF, alt. ca 970 m, on rocky patch, Coll.: Manju 120297 (CAL); Maharashtra: Bryophytes of Western India, Union of India, Bombay state, Satara district, near the summit of the Western Ghats, Mahabaleshwar, 17°55' N, 73°40' E, altitude about 4500 feet, on stone, semi-sheltered, early Dist.: H.A. Gleason, Jr., Coll.: Hale H. Cook 46, 50 Det.: E.B. Bartram (FH); Tamil Nadu: Herbier Charrier, Indes Owglaises, Kodaikanal, Leg.: R.P. Foreau (FH); Beschi College Herb., Shembaganur, Palni hills, Kodaikanal, Leringe Path, about 6700 ft, Coll.: G.F. 17 (FH); Herbarium of Edwin B. Bartram, Herbier Charrier, Indes Owglaises, Pomburai, Leg.: R.P. Foreau (FH); Mosses of Southern India, Madras State, Madura, Palni hills, Kodaikanal and surrounding region, Kodaikanal, Residue of "Musci Madurenses Indiae Meridionalis Exsiccati", issued by Georges Foreau, S.J. distributed by The New York Botanical Garden, Leg.: G. Foreau 98; (FH, TNS 051214). Madhya Pradesh: Pachmarhi <sup>[29]</sup> <i>Campyloporium flavescens</i> (Hook.) Bosch and Sandelac. Bryol. Jav. 2: 128, 1865. Jharkhand: Chhota Nagpur: Netarhat (Gangulee, 1978-80) <sup>[43]</sup> <i>Campylopus ericoides</i> (Griff.) A. Jaeger, Ber. Thatigk.St. Gallischen Naturwiss. Ges. Madhya Pradesh: Pachmarhi	Western Ghats: Goa; Karnataka-Agumbe (Hulical Ranges, Kanalgudda), Kodagu (Nalkad Palace, Mercara); Kerala-Agasthyamalai Biosphere Reserve, Idukkeri; Kannur, Munnar, Parambikulam Tiger Reserve, Vellarimala, Wayanad; Maharashtra- Mahabaleshwar; Tamil Nadu-Agasthyamalai Biosphere Reserve; Kodaikanal (Perumal Malai), Madurai, Nilgiri hills (Udhagamandalam-Levings Path, Naduvattam, Thodabetta), Palni hills; Deccan Plateau and Eastern Ghats: Tamil Nadu-Namakkal (Kolli hills), Maharashtra

genus *Bryum* is recorded from most parts of the country with wide variations of characters. 45 species were documented by various taxonomists from India. But, many species seems to be overlapping. Future studies using the molecular technique to differentiate the species are warranted.

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## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

## ABBREVIATIONS

**B:** *Bryum*.

## SUMMARY

Bryophytes occupy various ecological regimes including adverse conditions. Most species showed morpho plasticity in characters. The genus *Bryum* is one of the largest genus, distributed throughout India and is an ideal example of this. Many species showed morphological similarities, but placed in different species. Thorough revision is warranted to discriminate the allied species of the genus using molecular or other modern approaches.

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