

Mosses (Musci) of Nagaland, North-eastern India

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ABSTRACT

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The present paper deals with the taxonomic study of 35 species of mosses belonging to 26 genera and 17 families. *Brachymerium* is the most dominant genus with 3 species. Bryaceae and Hypnaceae are the most existing families in the study area with 3 genera and 5 species each, followed by Pottiaceae with 3 genera and 4 species. It has been observed that plants growing on soil and rocks are more dominant than the epiphytic forms. The main objective of the present paper is to provide first hand information on the mosses of Kohima and Mokokchung districts of Nagaland for the first time.

Key-words: Mosses (Musci), Nagaland, north-eastern India.

INTRODUCTION

Nagaland, a north-eastern state of India, has an area of 16579 km². The vegetation of this state is summarized by several workers (Robinson 1841, Masters 1848, Clarke 1889, Bor 1942, Hynniewta 1986, Jamir & Rao 1988, Sinha & Singh 1994, Mehrotra et al. 2002).

Although bryophytes form a conspicuous element of the flora but no serious attention was given to the bryophytic flora of Nagaland. Gangulee (1969-80) worked on the mosses of eastern India and adjacent regions and reported 77 species of mosses belonging to 55 genera from different localities of Naga hills without giving the exact location of the distribution of these taxa in Nagaland-Manipur, as the boundaries of Nagaland and adjacent NE states were not clearly defined earlier. Recently, Bansal et al. (2010) explored the bryophytic wealth of some selected districts of this state and reported *Brachymerium bryoides* Hook. ex Schwaegr., *B. capitulatum* (Mitt.) Kindb. and *B. longicolle* Ther. whereas Nath et al. (2011) reported *Thuidium recognitum* (Hedw.) Lindb. var. *delicatulum* (Hedw.) Warnst for the first time from Mokokchung district of Nagaland and added this taxon to Indian bryoflora.

A preliminary survey of bryophytic diversity in

Nagaland was carried out with the objective to provide an updated information of mosses of this state. The study revealed occurrence of 35 species of mosses belonging to 26 genera and 17 families showing diverse ecological niche including habitat associations. The distribution of the taxa enumerated in the present paper has been shown in Text-figure 1 and Table 1.

MATERIAL AND METHOD

The bryophytes were collected in the month of August, 2008 from various parts of Nagaland, growing on soil and epiphytically on bark of trees. The specimens have been deposited in the Bryophyte Herbarium, National Botanical Research Institute, Lucknow (LWG).

TAXONOMIC OBSERVATION

I. **Family: Polytrichaceae Schwaegr. in Willd., Sp. Pl. ed. 4. 5(2): 1. 1830.**

1. *Pogonatum microstomum* (Schwaegr.) Brid., Bryol. Univ. 2: 745. 1827.

Ecology and Distribution: Plants grow on moist rocks and soil on the bank of Dikhu River across the bridge in association with *Philonotis glomerata*.

Specimen examined: Nagaland, on the bank of Dikhu river across the bridge, Mokokchung, 6.08.2008, Leg.: V. Nath, 248869B (LWG).

Table 1. Mosses distributed in Nagaland.

Family	Genus	Species	Gangulee (1969-80)	Distribution based on Herbarium specimens (LWG)
Polytrichaceae	<i>Pogonatum</i>	<i>P. papillosulum</i>	Naga hills	-
		<i>P. proliferum</i>	Naga hills	-
		<i>P. microstomum</i>	Naga hills	On the bank of Dikhu river across the bridge, Mokokchung
Funariaceae	<i>Funaria</i>	<i>F. hygrometrica</i> var. <i>calvescens</i>	Naga hills	-
Ditrichaceae	<i>Ceratodon</i>	<i>C. stenocarpus</i>	Naga hills	-
Dicranaceae	<i>Dicranodontium</i>	<i>D. decipiens</i>	Naga hills	-
		<i>D. asperulum</i>	Naga hills	-
		<i>D. dimorphum</i>	Naga hills	-
	<i>Symblepharis</i>	<i>S. reinwardtii</i>	Naga hills	-
		<i>S. vaginata</i>	Naga hills	-
	<i>Dicranum</i>	<i>D. assamicum</i>	Naga hills	-
		<i>D. lorifolium</i>	Naga hills	-
<i>D. kashmirensis</i>		-	On way to Dikhu river, Mokokchung	
Leucobryaceae	<i>Leucobryum</i>	<i>L. javense</i>	Naga hills	-
		<i>L. nilghiriense</i>	-	On way to Dikhu river, Mokokchung
Pottiaceae	<i>Oxystegus</i>	<i>O. cylindricus</i>	Naga hills	-
	<i>Pseudosymblepharis</i>	<i>P. pallidens</i>	Naga hills	-
	<i>Leptodontium</i>	<i>L. viticulosoides</i>	Naga hills	-
	<i>Bryoerythrophyllum</i>	<i>B. dentatum</i>	-	On the bank of Dikhu river across the bridge and at a house, Mokokchung,
	<i>Hydrogonium</i>	<i>H. amplexifolium</i>	-	On the bank of Dikhu river, Mokokchung
	<i>Hyophila</i>	<i>H. involuta</i>	-	On route to Durga Temple, on the bank of Dikhu river across the bridge, University Guest House, Mokokchung,
<i>H. nymaniana</i>		-	On route to Durga temple, University Guest House, Mokokchung,	
Grimmiaceae	<i>Racomitrium</i>	<i>R. subsecundum</i>	Naga hills	-
Splachnaceae	<i>Tayloria</i>	<i>T. subglabra</i>	Naga hills	-
		<i>T. indica</i>	Naga hills	-
Bryaceae	<i>Pohlia</i>	<i>P. campotrachela</i>	Naga hills	-
		<i>P. elongata</i>	Naga hills	-
		<i>B. longicolle</i>	-	At Cemetery, Kohima and Mokokchung
	<i>Brachymenium</i>	<i>B. exile</i>	Naga hills	-
		<i>B. bryoides</i>	-	University Guest House, Mokokchung
		<i>B. capitulatum</i>	-	University Guest House, campus of a house, Mokokchung
	<i>Anomobryum</i>	<i>A. auratum</i>	Naga hills	-
		<i>A. filiforme</i> var. <i>concinatum</i>	-	On route to Durga temple, Mokokchung
<i>Bryum</i>	<i>B. argenteum</i>	-	University Guest House, Mokokchung	
Mniaceae	<i>Mnium</i>	<i>M. rostratum</i>	Naga hills	-
Bartramiaceae	<i>Bartramia</i>	<i>B. halleriana</i>	Naga hills	-
	<i>Fleischerobryum</i>	<i>F. longicolle</i>	Naga hills	-
	<i>Bartramidula</i>	<i>B. bartramioides</i>	Naga hills	-
	<i>Philonotis</i>	<i>P. angusta</i>	-	On way to Durga Temple, Mokokchung
<i>P. glomerata</i>		-	Near Wokha and on bank of Dikhu river across the bridge, Mokokchung	

Ptychomitriaceae	<i>Ptychomitrium</i>	<i>P. rhacomitrioides</i>	Naga hills	-
Orthotrichaceae	<i>Macromitrium</i>	<i>M. turgidum</i>	Naga hills	-
		<i>M. sulcatum</i>	Naga hills	-
		<i>M. nepalense</i>	Naga hills	-
		<i>M. hamatum</i>	Naga hills	-
		<i>M. rigbyanum</i>	Naga hills	-
Leucodontaceae	<i>Forsstroemia</i>	<i>F. inclusa</i>	Naga hills	-
Trachypodaceae	<i>Trachypodopsis</i>	<i>T. serrulata</i>	Naga hills	-
Pterobryaceae	<i>Symphysodontella</i>	<i>S. tortifolia</i>	Naga hills	-
Pterobryaceae	<i>Pterobryopsis</i>	<i>P. nematosa</i>	Naga hills	-
		<i>P. orientalis</i>	Naga hills	-
Meteoriaceae	<i>Papillaria</i>	<i>P. fuscescens</i>	Naga hills	-
	<i>Meteorium</i>	<i>M. buchananii</i>	Naga hills	-
	<i>Pseudobarbella</i>	<i>P. compressiramea</i>	Naga hills	-
	<i>Meteoriopsis</i>	<i>M. reclinata</i>	Naga hills	-
	<i>Chrysocladium</i>	<i>C. horridum</i>	Naga hills	-
	<i>Floribundaria</i>	<i>F. floribunda</i>	-	Mokokchung
Neckeraceae	<i>Neckera</i>	<i>N. himalayana</i>	Naga hills	-
		<i>N. crenulata</i>	Naga hills	-
	<i>Homaliodendron</i>	<i>H. montagneanum</i>	Naga hills	-
		<i>H. scalpellifolium</i>	Naga hills	-
Daltoniaceae	<i>Daltonia</i>	<i>D. gemmipara</i>	Naga hills	-
Leskeaceae	<i>Anomodon</i>	<i>A. viticulosus</i>	Naga hills	-
		<i>A. minor</i>	Naga hills	-
Thuidiaceae	<i>Claopodium</i>	<i>C. prionophyllum</i>	Naga hills	-
	<i>Haplocladium</i>	<i>H. angustifolium</i>	Naga hills	-
	<i>Thuidium</i>	<i>T. meyenianum</i>	Naga hills	Near Wokha and on way to Dikhu river, Mokokchung
		<i>T. venustum</i>	Naga hills	-
		<i>T. minusculum</i>	Naga hills	-
		<i>T. cymbifolium</i>	Naga hills	-
		<i>T. recognitum</i> var. <i>delicatulum</i>	-	On way to Dikhu river, Mokokchung
<i>Actinothuidium</i>	<i>A. hookeri</i>	Naga hills	-	
Racopilaceae	<i>Racopilum</i>	<i>R. orthocarpum</i>	-	Near Dikhu river, Mokokchung
Brachytheciaceae	<i>Bryhnia</i>	<i>B. decurvans</i>	Naga hills	University Guest House, Mokokchung
	<i>Brachythecium</i>	<i>B. buchananii</i>	Naga hills	On the bank of Dikhu river across the bridge, Mokokchung
	<i>Rhynchostegium</i>	<i>R. herbaceum</i>	-	On way to Kohima near Wokha
Plagiotheciaceae	<i>Plagiothecium</i>	<i>P. cavifolium</i>	-	Amgure National Highway, Kohima road and Mokokchung
		<i>P. neckeroideum</i> var. <i>sikkimense</i>	-	Mokokchung
Stereophyllaceae	<i>Entodontopsis</i>	<i>E. leucostega</i>	-	University Guest House, Mokokchung and at Cemetery, Kohima
Sematophyllaceae	<i>Hageniella</i>	<i>H. assamica</i>	Naga hills	-
		<i>H. isopterygioides</i>	Naga hills	-
	<i>Clastrobryopsis</i>	<i>C. planula</i>	Naga hills	-
	<i>Aptychella</i>	<i>A. borii</i>	Naga hills	Near Wokha-Kohima route

	<i>Pylaisiopsis</i>	<i>P. speciosa</i>	Naga hills	-
	<i>Wijkia</i>	<i>W. penicillata</i>	Naga hills	-
		<i>W. baculifera</i>	Naga hills	-
	<i>Brotherella</i>	<i>B. filiformis</i>	Naga hills	-
		<i>B. amblystegia</i>	Naga hills	-
	<i>Glossadelphus</i>	<i>G. zollingeri</i>	Naga hills	-
		<i>G. bilobatus</i>	Naga hills	-
Fabroniaceae	<i>Fabronia</i>	<i>F. secunda</i>	-	Mokokchung
		<i>F. schensiana</i>	-	University Guest House, Mokokchung
Regmatodontaceae	<i>Regmatodon</i>	<i>R. orthostegius</i>	-	Mokokchung
Hypnaceae	<i>Pylaisia</i>	<i>P. falcata</i>	Naga hills	-
	<i>Ectropothecium</i>	<i>E. cyperoides</i>	-	Near Wokha
		<i>E. sikkimense</i>	-	University Guest House, Mokokchung
	<i>Hypnum</i>	<i>H. subimponens</i> ssp. <i>ulophyllum</i>	Naga hills	On way to Kohima near Wokha and on way to Dikhu river, Mokokchung
	<i>Taxiphyllum</i>	<i>T. giraldii</i>	-	On way to Kohima near Wokha
		<i>T. maniae</i>	-	Near Wokha
	<i>Ectropothecium</i>	<i>E. cyperoides</i>	Naga hills	-
	<i>Vesicularia</i>	<i>V. reticulata</i>	Naga hills	-
	<i>Leiodontium</i>	<i>L. complanatum</i>	Naga hills	-
	<i>Ctenidium</i>	<i>C. lychnites</i>	Naga hills	-
Entodontaceae	<i>Entodon</i>	<i>E. scariosus</i>	-	On roadside near Dikhu river, Mokokchung
	<i>Erythrodontium</i>	<i>E. julaceum</i>	-	Mokokchung
Hylocomiaceae	<i>Leptohymenium</i>	<i>L. tenue</i>	Naga hills	-

II. Family: Bryaceae Schwaegr. in Willd., Sp. Pl. ed. 4. 5(2): 47. 1830.

- Anomobryum filiforme* (Dicks.) Solms var. *concinatum* (Spruc.) Amann, Rev. Bryol. 20: 43. 1893.

Ecology and Distribution: Plants grow on stony walls and soil on the road side, on way to Durga temple in association with *Hyophila rosea* and *Marchantia paleacea*.

Specimens examined: Nagaland, on route to Durga temple, Mokokchung, 3.08.2008. Leg.: V. Nath, 248804B, 248805B, 248806B, 248807B, 248808B (LWG).

- Brachymerium bryoides* Hook. ex Schwaegr., Spec. Musc. Suppl. 2(1): 134. 1824.

Ecology and Distribution: Plants grow on side of pots at University Guest House in association with *Hyophila involuta* and *Bryum argenteum*.

Specimen examined: Nagaland, University Guest House, Mokokchung, on side of pots, 4.08.2008, Leg.: V. Nath, 248831C (LWG).

- Brachymerium capitulatum* (Mitt.) Kindb. Enum. Bryin. Exot. 86. 1889.

Ecology and Distribution: Plants grow epiphytically on *Thuja* tree at University Guest House, in association with *Entodontopsis leucostega*, *Hyophila rosea* and *Fabronia schensiana* and on soil and bricks, in a house in association with *Frullania ericoides*.

Specimens examined: Nagaland, University Guest House, Mokokchung, 4.08.2008, Leg.: V. Nath, 248813A, 248814A (LWG); campus of a house, Mokokchung, 6.08.2008, Leg.: V. Nath, 248874 (LWG); Mokokchung, 7.08.2008, Leg.: V. Nath, 248880C, 248885B, 248890B (LWG).

- Brachymerium longicolle* Ther., Bull. Soc. Bot. Geneve 26: 85.1936.



1. *Pogonatum microstomum* (Schwaegr.) Brid.
2. *Anomobryum filiforme* (Dicks.) Solms var. *coccinatum* (Spruc.) Amann
3. *Brachymerium bryoides* Hook. ex Schwaegr.
4. *B. capitulatum* (Mitt.) Kindb.
5. *B. longicolle* Ther.
6. *Bryum argenteum* Hedw.
7. *Philonotis angusta* Mitt.
8. *P. glomerata* Mitt.
9. *Thuidium meyenianum* (Hamp.) Doz. & Molk.
10. *T. recognitum* (Hedw.) Lindb. var. *delicatulum* (Hedw.) Warnst.
11. *Racopilum orthocarpum* Wils. ex Mitt.
12. *Brachythecium buchananii* (Hook) Jaeg.
13. *Bryhnia decurvans* (Mitt.) Dix.
14. *Rhynchostegium herbaceum* (Mitt.) Jaeg.
15. *Plagiothecium cavifolium* (Brid.) Iwats.
16. *P. neckeroideum* B.S.G. var. *sildaimense* Ren. & Card.
17. *Entodontopsis leucostega* (Brid.) Buck & Ireland
18. *Ectropothecium cyperoides* (Hook) Jaeg.
19. *E. sikkimense* (Ren. & Card.) Ren. & Card
20. *Hypnum subimponens* Lesq. ssp. *ulophyllum* (C. Mueel.) Ando
21. *Taxiphyllum giraldii* (C. Muell.) Fleisch
22. *T. maniae* (Ren. & Par.) Fleisch.
23. *Entodon scariosus* Ren. & Card.
24. *Erythrodonium julaceum* (Schwaegr.) Par.
25. *Aptychella borii* Dix.
26. *Fabronia secunda* Mont.
27. *F. schensiana* C. Muell.
28. *Regmatodon orthostegius* Mont.
29. *Floribundaria floribunda* (Doz. & Molk.) Fleisch.
30. *Bryoerythrophyllum dentatum* (Mitt.) Chen
31. *Hydrogonium amplexifolium* (Mitt.) Chen
32. *Hyophila involuta* (Hook.) Jaeg.
33. *H. nymaniana* (Fleisch.) Menzel
34. *Dicranum kashmirensense* Broth.
35. *Leucobryum nilghiriense* C. Muell.

Text-figure 1. Map showing distribution of mosses in Nagaland.

Ecology and Distribution: Plants grow epiphytically on *Hibiscus rosa-sinensis* at Cemetery, Kohima in association with *Entodontopsis leucostega* and epiphytically on *Thuja* tree at Mokokchung in association with *Plagiothecium cavifolium*, *Regmatodon orthostegius* and *Frullania wallichiana*.

Specimens examined: Nagaland, at Cemetery, Kohima, epiphytic on *Hibiscus rosa-sinensis*, 5.08.2008, Leg.: V. Nath, 248850A (LWG); Mokokchung, 7.08.2008, Leg.: V. Nath, 248881A, 248883B (LWG).

5. *Bryum argenteum* Hedw., Spec. Musc. 181.1801.

Ecology and Distribution: Plants grow epiphytically on *Thuja* tree at University Guest House in association with *Hyophila involuta* and on rocky walls in association with *Bryhnia decurvans* and *Hyophila rosea*.

Specimens examined: Nagaland, University Guest House, Mokokchung, on *Thuja* tree, 4.08.2008, Leg.: V. Nath, 248818B (LWG); on rocky walls, 4.08.2008, Leg.: V. Nath, 248824C, 248825C, 248831B (LWG).

III. Family: Bartramiaceae Schwaegr. in Willd., Sp. Pl. ed. 4. 5(2): 90. 1830.

1. *Philonotis angusta* Mitt., Musci Ind. Or.: 61. 1859.

Ecology and Distribution: Plants grow on moist stony walls, on way to Durga temple in association with *Anomobryum filiforme* var. *concinatum*.

Specimen examined: Nagaland, on way to Durga Temple, Mokokchung, 3.08.2008, Leg.: V. Nath, 248808A (LWG).

2. *Philonotis glomerata* Mitt., Musci Ind. Or.: 60. 1859.

Ecology and Distribution: Plants grow on soil and moist stony walls, near Wokha in association with *Riccardia* spp. and on moist soil and rocks, on bank of Dikhu river across the bridge in association with *Pogonatum microstomum*.

Specimens examined: Nagaland, near Wokha, on moist soil and moist stony walls, 5.08.2008, Leg.: V. Nath, 248838A, 248841B (LWG); on bank of Dikhu river across the bridge, Mokokchung, 6.08.2008, Leg.: V. Nath, 248869 (LWG).

IV. Family: Thuidiaceae Schimp., Syn. Musc. Eur. 493. 1860.

1. *Thuidium meyenianum* (Hamp.) Doz. et Molk., Bryol. Jav. 2: 121. 1865.

Ecology and Distribution: Plants grow on soil and stony walls, near Wokha and on way to Dikhu river.

Specimen examined: Nagaland, near Wokha, on soil and stony walls, 5.08.2008, Leg.: V. Nath, 248845 (LWG); on way to Dikhu river, Mokokchung, on moist soil, 6.08.2008, Leg.: V. Nath, 248853 (LWG).

2. *Thuidium recognitum* (Hedw.) Lindb. var. *delicatulum* (Hedw.) Warnst, Bot. Centralbl. 5: 185. 1881.

Ecology and Distribution: Plants grow on moist soil, on way to Dikhu river in association with *Hypnum subimponens* ssp. *ulophyllum* and *Leucobryum nilghiriense*.

Specimen examined: Nagaland, on way to Dikhu river, Mokokchung, on moist soil, 6.08.2008, Leg.: V.

Nath, 248857B, 248858B (LWG).

V. Family: Racopilaceae Kindb., Bot. Centralbl. 76: 85. 1898.

1. *Racopilum orthocarpum* Wils. ex Mitt., Musci Ind. Or.: 136. 1859.

Ecology and Distribution: Plants grow on moist rock and epiphytically on bark of angiospermic tree, near Dikhu river.

Specimens examined: Nagaland, near Dikhu river, Mokokchung, 6.08.2008, Leg.: V. Nath, 248862, 248865A (LWG).

VI. Family: Brachytheciaceae Schimp., Syn. Musc. Eur., ed. 2. xcv sic (cxv), 637. 1876.

1. *Brachythecium buchananii* (Hook.) Jaeg., Ber. S. Gall. Naturw. Ges. 1876-77: 341. 1878.

Ecology and Distribution: Plants grow on stony walls, on the bank of Dikhu river across the bridge in association with *Bryoerythrophyllum dentatum*.

Specimens examined: Nagaland, on the bank of Dikhu river across the bridge, Mokokchung, 6.08.2008, Leg.: V. Nath, 248870, 248871A, 248872B, 248873B (LWG).

2. *Bryhnia decurvans* (Mitt.) Dix., J. Bot. 60: 287. 1922.

Ecology and Distribution: Plants grow on rocky walls at University Guest House in association with *Hyophila rosea* and *Bryum argenteum*.

Specimens examined: Nagaland, University Guest House, Mokokchung, on rocky walls 4.08.2008, Leg.: V. Nath, 248824A, 248825B, 248826B (LWG).

3. *Rhynchostegium herbaceum* (Mitt.) Jaeg., Ber. S. Gall. Naturw. Ges. 1876-77: 368. 1878.

Ecology and Distribution: Plants grow on moist soil, on way to Kohima.

Specimen examined: Nagaland, on way to Kohima near Wokha, on moist soil, 5.08.2008, Leg.: V. Nath, 248835, 248843 (LWG).

VII. Family: Plagiotheciaceae (Broth.) Fleisch., Nova Guinea 8: 748. 1912.

1. *Plagiothecium cavifolium* (Brid.) Iwats., J. Hattori Bot. Lab. 33: 360. 1970.

Ecology and Distribution: Plants grow epiphytically on bark of tree *Cupressus torudosa*, on Kohima road (Amgure National Highway) in association with *Frullania muscicola* and on *Thuja* tree at Mokokchung in association with *Brachymerium longicolle*.

Specimens examined: Nagaland, Kohima road, Amgure National Highway, 3.08.2008, Leg.: V. Nath, 248809B (LWG), Mokokchung, 7.08.2008, Leg.: V. Nath, 248881B (LWG).

2. *Plagiothecium neckeroideum* B.S.G. var. *sikkimense* Ren. et Card., Bull. Soc. R. Bot. Belg. 41(1): 108. 1905.

Ecology and Distribution: Plants grow epiphytically on *Thuja* tree at Mokokchung in association with *Lejeunea cavifolia*.

Specimen examined: Nagaland, Mokokchung, 7.08.2008, Leg.: V. Nath, 248892B (LWG).

VIII. Family: **Stereophyllaceae (Fleisch.) Buck & Ireland, Nova Hedwigia 41: 95 (1985)**
Plagiotheciaceae subfam. Stereophylloideae Fleisch., Musci Fl. Buitenzorg 4: 1158 (1923), "Stereophylleae".

1. *Entodontopsis leucostega* (Brid.) Buck & Ireland, Nova Hedwigia 41: 103-104. 1985.

Ecology and Distribution: Plants grow epiphytically on bark of *Thuja* tree at University Guest House in association with *Brachymerium capitulatum*, *Fabronia secunda*, *Fabronia schensiana* and *Lejeunea cavifolia*, and on bark of *Hibiscus rosa-sinensis* at Cemetery, Kohima in association with *Brachymerium longicolle*.

Specimens examined: Nagaland, University Guest House, Mokokchung, 4.08.2008, Leg.: V. Nath, 248810, 248814B, 248815A (LWG); Cemetery, Kohima, 5.08.2008, Leg.: V. Nath, 248850 (LWG); Mokokchung, 7.08.2008, Leg.: V. Nath, 248882, 248884, 248885A, 248888A, 248890A (LWG).

IX. Family: **Hypnaceae Schimp., Croll. Bryol. Eur. 113. 1855 (1856).**

1. *Ectropothecium cyperoides* (Hook.) Jaeg., Ber. S. Gall. Naturw. Ges. 1877-78: 259. 1880.

Ecology and Distribution: Plants grow on soil and moist stony walls near Wokha.

Specimen examined: Nagaland, near Wokha, on soil and moist stony walls, 5.08.2008, Leg.: V. Nath, 248844 (LWG).

2. *Ectropothecium sikkimense* (Ren. et Card.) Ren. et Card., Bull. Soc. R. Bot. Belg. 41(1): 109. 1905.

Ecology and Distribution: Plants grow on moist walls and pots at University Guest House.

Specimen examined: Nagaland, University Guest House, Mokokchung, on moist walls and pots, 4.08.2008, Leg.: V. Nath, 248823 (LWG).

3. *Hypnum subimponens* Lesq. ssp. *ulophyllum* (C. Muell.) Ando, Bot. Mag. Tokyo, 79: 766. 1966.

Ecology and Distribution: Plants grow on moist soil on way to Kohima near Wokha in association with *Taxiphyllum giraldii* and *Plagiochasma appendiculatum* and on way to Dikhu river in association with *Thuidium recognitum* var. *delicatulum*.

Specimens examined: Nagaland, on way to Kohima near Wokha, on moist soil, 5.08.2008, Leg.: V. Nath, 248834, 248839A (LWG); on way to Dikhu river, Mokokchung, 6.08.2008, Leg.: V. Nath, 248856B, 248857A (LWG).

4. *Taxiphyllum giraldii* (C. Muell.) Fleisch., Musci Fl. Buitenzorg 4: 1435. 1923.

Ecology and Distribution: Plants grow on moist soil, on way to Kohima.

Specimen examined: Nagaland, on way to Kohima near Wokha, on moist soil, 5.08.2008, Leg.: V. Nath, 248834B (LWG).

5. *Taxiphyllum maniae* (Ren. et Par.) Fleisch., Musci Fl. Buitenzorg 4: 1436. 1923.

Ecology and Distribution: Plants grow on soil and moist stony walls near Wokha.

Specimen examined: Nagaland, near Wokha, on soil and moist stony walls, 5.08.2008, Leg.: V. Nath, 248842 (LWG).

X. Family: Entodontaceae Kindb., Gen. Eur. Northamer. Bry. 7. 1897.

1. *Entodon scariosus* Ren. et Card., Bull. Soc. R. Bot. Belg. 34(2): 75. 1896.

Ecology and Distribution: Plants grow on roadside near Dikhu river and epiphytically on *Thuja* tree at Mokokchung.

Specimens examined: Nagaland, on roadside near Dikhu river, Mokokchung, 6.08. 2008, Leg.: V. Nath, 248859 (LWG); Mokokchung, on *Thuja* tree, 7.08.2008, Leg.: V. Nath, 248887, 248891 (LWG).

2. *Erythrodontium julaceum* (Schwaegr.) Par., Index Bryol. 436. 1896.

Ecology and Distribution: Plants grow epiphytically on *Thuja* tree at Mokokchung in association with *Fabronia secunda*.

Specimen examined: Nagaland, Mokokchung, 7.08.2008, Leg.: V. Nath, 248889A (LWG).

XI. Family: Sematophyllaceae Broth., Nat. Pfl. 1(3): 1098. 1908.

1. *Aptychella borii* Dix., J. Bombay Nat. Hist. Soc. 39: 790. 1937.

Ecology and Distribution: Plants grow on moist soil and rock near Wokha.

Specimen examined: Nagaland, near Wokha-Kohima route, on moist soil, 5.08.2008, Leg.: V. Nath, 248833 (LWG).

XII. Family: Fabroniaceae Schimp., Coroll. Bryol. Eur. 102. 1855. 1856.

1. *Fabronia secunda* Mont., Ann. Sc. Nat. Bot. Ser. 2. 17: 251. 1842.

Ecology and Distribution: Plants grow epiphytically on *Thuja* tree at Mokokchung in association with *Lejeunea cavifolia*, *Entodontopsis leucostega*, *Lejeunea cavifolia* and *Erythrodontium julaceum*.

Specimens examined: Nagaland, Mokokchung, 7.08.2008, Leg.: V. Nath, 248888C, 248889B, 248896, 248897B (LWG).

2. *Fabronia schensiana* C. Muell., Nuov. Giorn. Bot. Ital. n. ser. 4: 262. 1897.

Ecology and Distribution: Plants grow on stony

walls at University Guest House in association with *Hyophila rosea* and *Bryhnia decurvans* and on *Thuja* tree in association with *Entodontopsis leucostega*, *Brachymerium capitulatum* and *Floribundaria floribunda*.

Specimens examined: Nagaland, University Guest House, Mokokchung, on stony walls, 4.08.2008, Leg.: V. Nath, 248826C (LWG); University Guest House, Mokokchung, on pots and stones, 4.08.2008, Leg.: V. Nath, 248828, 248829 (LWG); Mokokchung, 7.08.2008, Leg.: V. Nath, 248879, 248890C, 248893B (LWG).

XIII. Family: Regmatodontaceae Broth., Nat. Pfl. I(3): 1125. 1908.

1. *Regmatodon orthostegius* Mont., Ann. Sc. Nat. Bot. ser.2. 17: 248. 1842.

Ecology and Distribution: Plants grow epiphytically on *Thuja* tree at Mokokchung in association with *Brachymerium longicolle* and *Frullania wallichiana*.

Specimen examined: Nagaland, Mokokchung, 7.08.2008, Leg.: V. Nath, 248883C (LWG).

XIV. Family: Meteoriaceae Kindb., Gen. Eur. Northamer. Bry. 7. 1897.

1. *Floribundaria floribunda* (Doz. et Molk.) Fleisch., Hedwigia 44: 302. 1905.

Ecology and Distribution: Plants grow epiphytically on *Thuja* tree at Mokokchung in association with *Fabronia schensiana*.

Specimens examined: Nagaland, Mokokchung, 7.08.2008, Leg.: V. Nath, 248893A, 248894 (LWG).

XV. Family: Pottiaceae Schimp., Coroll. Bryol. Eur. 24. 1855. 1856.

1. *Bryoerythrophyllum dentatum* (Mitt.) Chen, Hedwigia 80: 253. 1941.

Ecology and Distribution: Plants grow on stony walls on the bank of Dikhu river across the bridge and at a house in association with *Brachythecium buchananii*.

Specimens examined: Nagaland, on the bank of Dikhu river across the bridge at a house, Mokokchung, 6.08.2008, Leg.: V. Nath, 248871B, 248878 (LWG).

2. *Hydrogonium amplexifolium* (Mitt.) Chen, Hedwigia 80: 240. 1941.

Ecology and Distribution: Plants grow on moist rock on the bank of Dikhu river.

Specimen examined: Nagaland, on the bank of Dikhu river, Mokokchung, 6.08.2008, Leg.: V. Nath, 248867 (LWG).

3. *Hyophila involuta* (Hook.) Jaeg., Ber. S. Gall. Naturw. Ges. 1871-72: 356. 1873.

Ecology and Distribution: Plants grow on stony moist wall on route to Durga temple and on soil and bricks, epiphytically on *Thuja* tree at University Guest House in association with *Brachythecium buchananii* and *Bryum argenteum*.

Specimen examined: Nagaland, on route to Durga Temple, Mokokchung, on moist stony wall, 3.08.2008, Leg.: V. Nath, 248803 (LWG); on the bank of Dikhu river across the bridge, Mokokchung, 6.08.2008, Leg.: V. Nath, 248873A (LWG); University Guest House, on *Thuja* tree, 4.08.2008, Leg.: V. Nath, 248818A, 248819, 248820 (LWG); University Guest House, on walls, 4.08.2008, Leg.: V. Nath, 248827B, 248831A (LWG).

4. *Hyophila nymaniana* (Fleisch.) Menzel, 22: 198 (1992).

Ecology and Distribution: Plants grow on moist stony walls and soil on the road side, on route to Durga temple in association with *Anomobryum filiforme* var. *concinatum* and *Marchantia paleacea*, on rocky walls at University Guest House in association with *Bryhnia decurvans* and *Bryum argenteum* and epiphytically on *Thuja* tree in association with *Brachymenium capitulatum*.

Specimens examined: Nagaland, on route to Durga temple, Mokokchung, 3.08.2008 Leg.: V. Nath, 248804A, 248805A, 248806A, 248807A (LWG); University Guest House, Mokokchung, 4.08.2008, Leg.: V. Nath, 248824B, 248825A, 248826A, 248830, 248832 (LWG); University Guest House, on *Thuja* tree, 4.08.2008, Leg.: V. Nath, 248821, 248822 (LWG); University Guest House, on walls, 4.08.2008, Leg.: V. Nath, 248827A (LWG); Nagaland, Mokokchung, 7.08.2008, Leg.: V. Nath, 248880A (LWG).

XVI. Family: Dicranaceae Schimp., Coroll. Bryol. Eur. 11. 1855-1856.

1. *Dicranum kashmirensense* Broth., Acta Soc. Sci. Fenn. 24(2): 9. 1898.

Ecology and Distribution: Plants grow on moist soil on way to Dikhu river.

Specimen examined: Nagaland, on way to Dikhu river, Mokokchung, 6.08.2008, Leg.: V. Nath, 248854 (LWG).

XVII. Family: Leucobryaceae Schimp., Coroll. Bryol. Eur. 19. 1855 (1856).

1. *Leucobryum nilghiriense* C. Muell., Bot. Zeit. 32: 556. 1854.

Ecology and Distribution: Plants grow on moist soil, on way to Dikhu river in association with *Thuidium recognitum* var. *delicatulum*.

Specimen examined: Nagaland, on way to Dikhu river, Mokokchung, on moist soil, 6.08.2008, Leg.: V. Nath, 248858A (LWG).

DISCUSSION

The north-eastern region of India, particularly Nagaland, has been bryologically richest territory due to propitious environmental factors. The present study revealed the occurrence of 35 species of mosses belonging to 26 genera and 17 families. Bryaceae and Hypnaceae are the most dominant families in the study area followed by Pottiaceae. Bryaceae includes 3 species of *Brachymenium*, single species of *Bryum* and single species of *Anomobryum* whereas Hypnaceae includes 2 species of *Ectropothecium*, 2 species of *Taxiphyllum* and a single species of *Hypnum*. Under family Pottiaceae, *Hyophila* is the dominant genus with 2 species followed by a single species of *Bryoerythrophyllum* and *Hydrogonium*. Brachytheciaceae is another dominant family and comprises 3 genera with single species each followed by Entodontaceae with 2 genera and single species each. Bartramiaceae, Fabroniaceae, Thuidiaceae and Plagiotheciaceae are the less dominating families with single genus and 2 species each. It has been observed that the family Racopilaceae, Meteoriaceae, Polytrichaceae, Dicranaceae, Leucobryaceae,

Stereophyllaceae, Regmatodontaceae and Sematophyllaceae are very less distributed with single genus and single species each. In the present paper, an attempt has been made to provide an account of mosses of the Kohima and Mokokchung district of Nagaland for the first time.

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