

**BRYOPHYTE FLORA OF GREATER MYMENSINGH DISTRICT OF
BANGLADESH- CLASS: HEPATICOPSIDA AND ANTHOCEROTOPSIDA**

KHURSHIDA BANU-FATTAH* AND SUJAN KUMER SARKER

Department of Botany, Ananda Mohan College, College Road, Mymensingh, Bangladesh

Keywords: Bryophytes; Hepaticopsida; Anthocerotopsida; Liverworts; Hornworts; Mymensingh District.

Abstract

The greater Mymensingh district of Bangladesh, particularly the hilly areas are rich in Bryophyte flora. The present paper on class Hepaticopsida (Liverworts) and Anthocerotopsida (Hornworts) represents primary as well as secondary data collection and includes an account of 48 species under 12 genera, nine families and four orders. An alphabetic arrangement of taxa with short description, habitats, localities, names of collectors with dates and collection numbers are provided.

Introduction

The greater Mymensingh district, particularly the hilly areas are good abodes of Bryophytes. A reasonably good amount of taxonomic works have been done on Bryophytes of Bangladesh but not enough has been done on its distribution.

Khan (1955, 1957) for the first time, worked on Liverworts and reported several species including some new species but none of these was from greater Mymensingh district. Tixier (1967) collected and reported a good number of Liverworts in a checklist but all these were from Chittagong region. After a long gap of years, Hadiuzzaman and Chakravarty (1981,1983) reported five Liverworts and two Hornworts, out of which only one species, *Anthoceros laevis* L. was from Mymensingh district. Kamruzzaman (1995) gave an illustrated account of 45 species of *Riccia* L. which was later included by Hadiuzzaman (2007) in the Encyclopedia of Flora and Fauna of Bangladesh, many of which were collected of the greater Mymensingh district. Banu (1991) for the first time, gave a district-wise distribution of Bryophyta but that was confined only to mosses. Later Banu-Fattah (1998) dealt with Bryophyte flora of Chittagong zone and reported several species of Hepaticopsida and Anthocerotopsida. Recently, Banu-Fattah and Sarker (2007) presented a comprehensive list of mosses under the class Bryopsida from greater Mymensingh district. The present paper is the continuation of the previous paper on Bryophytes dealing with the rest of the classes i.e. Hepaticopsida and Anthocerotopsida.

The present paper is based on the specimens collected by the authors as well as many other collectors and all the species previously reported from this region. There are some unpublished reports on the presence of many other species but these have not been included here since complete informations are not available. The present study on Hepaticopsida and Anthocerotopsida includes an account of 48 species under 12 genera, nine families and four orders.

*Corresponding author's present address : Flat B-3, House 27, Road 5, Dhanmondi R/A., Dhaka-1205, Bangladesh. E-mail: qafattah@gmail.com

Materials and Methods

The areas covered in this study is the greater Mymensingh district of Dhaka Division of Bangladesh which at present is comprised of six administrative districts namely, Jamalpur, Kishoreganj, Mymensingh, Netrokona, Sherpur and Tangail. Some of the informations on this region have been given in the previous paper (Banu-Fattah and Sarker, 2007).

This paper is based mainly on fresh materials collected from different localities under the greater Mymensingh district. Most of the specimens collected were worked out and identified. Out of all these specimens, only one has been mentioned from each district. All the specimens collected by the authors and their associates are preserved in the Bryology Herbarium, Department of Botany, Ananda Mohan College, Mymensingh. In addition, this list includes all the species previously reported from this region.

An alphabetical arrangement of the taxa with brief accounts of 48 species with habitats, localities, names of collectors with dates and numbers of collections are given in the following section.

Taxonomic enumeration

Class: Hepaticopsida; Order: Jungermanniales; Family: Lejeuneaceae;

Genus: Lejeunea Libert, Ann. Gen. Sc. Phys. 6: 372 (1820).

1. **Lejeunea** sp.

Leaves distant, alternate, spreading, ovate to ovate-round, amphigastria small, bilobed, margin entire, apex smooth, marginal cells smaller, cells smooth. Grows on bark of trees.

Specimen examined: **Sherpur:** Zhinaigati, Runctia, Khurshida and Sujan, 17.9.1986, No. 5.

Family: Lophocoleaceae;

Genus: Chiloscypus Corda in Opiz, Beitr.1: 651 (1829).

2. **Chiloscypus argutus** Nees in Gott., Lindenb. & Nees. Syn. Hep.: 183 (1845).

Plant brownish-green, leaves alternate, plano-distichous, slightly imbricate, quadrate to rectangular or ovate-quadrate, margin entire, apex with many coarse teeth, amphigastria distant, small, bifid to about the middle. Grows on damp soil.

Specimen examined: **Sherpur:** Zhinaigati, Runctia, near forest office, Khurshida and Sujan, 17.9.1996, No. 14.

Order: Marchantiales; Family: Aytoniaceae**Genus: Asterella** P. Beauv. in Cuvier (ed.), Dictionnaire Sci. Nat. 3: 257 (1905).3. **Asterella** sp.

Thallus long with poor branching, midrib not distinct, male receptacle very short, disc round, female receptacle long, bearing four lobed disc, receptacle with small red papillae, capsule bright yellow, invested by perianth. Grows on damp walls.

Specimen examined: **Mymensingh:** Gouripur, College campus, Sujan, 12.1.1989, No. 17.

Genus: Plagiochasma L. et L. in Lehm. Pug. Pl. IV. P: 13 (1832).4. **Plagiochasma appendiculatum** L. et L. Pug. IV: P. 14 (1832).

Thallus large, thick, midrib not distinct, margin purple coloured, ventral surface with appendiculate scales, male receptacle horse-shoe shaped without bristle, female receptacle stalked, usually with 5-6 lobes. Grows mostly on old damp walls and bricks.

Specimens examined: **Jamalpur:** Railway station, Anisur, 5.3.1993, No. 47. **Kishoreganj:** Azim Uddin school campus, Nasima, 25.2.1993, No. 33. **Mymensingh:** Nasirabad collegiate boys school, Khurshida and Sujan, 27.12.1992, No. 21. **Netrokona:** Kalmakanda, Iffat, 5.2.1998, No. 57. **Sherpur:** Civil surgeon's office, Meher, 5.7.2000, No. 49. **Tangail:** Adalat para, Nurjahan, 25.12.2000, No. 16.

Family: Cyathodiaceae**Genus: Cyathodium** Kunze in Lehm. Pug. VI.: 17 (1854).5. **Cyathodium tuberosum** Kashyap, New Phyt. Vol. XIII.: 210 (1914).

Thallus very small, thin, yellowish to pale-green, once or twice dichotomously divided, densely overlapping, lobes linear to oblong; sporophyte with clasping involucre, spore spinous. Very common on damp walls, shaded places, holes, caves.

Specimens examined: **Jamalpur:** Doyamoy Mondir, Rezaul, 2.2.1992, No. 18. **Kishoreganj:** Karimganj, Marina, 7.12.1996, No. 23. **Mymensingh:** Principal's quarter, Ananda Mohan college, Khurshida, 5.11.1992, No. 8. **Netrokona:** Taligati college campus, Gokul, 2.2.2001, No. 51. **Tangail:** Senanibash, Ghatail, Rafiqul, 2.12.1999, No. 24.

Family: Marchantiaceae**Genus: Dumortiera** Reinw. Bl. et Nees Nova Acta Leop.

Carol. VII.: 410 (1824).

6. **Dumortiera hirsuta** Reinw. Bl. et Nees Nova Acta Leop. Carol. VII.: 410 (1824).

Thallus very large, broad, translucent with conspicuous midrib, apex deeply emerginate, air chambers absent, scales simple or rudimentary, hyaline, male receptacle

terminal, depressed at the centre, both male and female receptacles with bristles. Grows on damp, shaded soil.

Specimens examined: **Mymensingh:** Concern office, Shaheb park, Khurshida and Sujan, 26.12.1992, No. 27. **Netrokona:** Near BDR Camp, Bijoypur, Durgapur, Tania, 15.5.2001, No. 77. **Sherpur:** Near picnic spot, Gazni, Khurshida and Sujan, 25.9.1997, No. 68. **Tangail:** Forest office, Loharia, Modhupur, Rashed, 2.2.1995, No. 99.

Genus: Marchantia L., Sp. Pl.: 1137 (1753).

7. Marchantia nepalensis L. et L. in Lehm. Pugiv.: 10 (1832).

Thallus without dark median line on dorsal surface, lobes broader and shorter, with conspicuous aereoles and scales, inner pore cruciate, male receptacle slightly lobed, 6-8, female receptacle umbonate, 7-8 rayed, gemmae cups lobed, dentate to shortly spinose on the margin. Grows on damp soil, walls and bricks.

Specimens examined: **Jamalpur:** Lawachapra bazar, Sribordi, Anisur, 5.12.1994, No. 40. **Kishoreganj:** Mithamoin, Apurbo, 5.8.1998, No. 59. **Mymensingh:** Ananda Mohan college campus, Khurshida and Sujan, 25.12.1992, No. 19. **Netrokona:** Helachia, Thakurakona, Gokul, 12.1.1994, No. 28. **Sherpur:** Gazni, Sujan, 25.9.1997, No. 63. **Tangail:** Jangalia, Gopalpur, Shashanka, 5.2.2000, No. 88.

8. Marchantia palmata Nees, Nova Acta XII: 193 (1824).

Thallus lobe long, narrow with distinct dark line in the middle on dorsal side, margin entire, apex emerginate, male receptacle very variable, either circular with many lobes or palmate with long narrow lobes, gemmae cups rare. Common on damp soil, walls and bricks.

Specimens examined: **Jamalpur:** Doyamoyee Mondir, Ethi, 5.12.1998, No. 46. **Kishoreganj:** Astagram brick field, Shahana, 5.3.1998, No. 38. **Mymensingh:** Near BDR sector office, Dholadia, Khagdoor, Khurshida and Sujan, 28.3.1993, No. 31. **Netrokona:** Town, Hadiuzzaman, Dec. 1980. **Sherpur:** Nokla Thana, Nokla, Delwar, 5.2.2001, No. 34. **Tangail:** Modhupur rubber garden, Nahid, 5.7.1999, No. 78.

Family: Ricciaceae

Genus: Riccia L., Sp. Pl. : 1138 (1753).

9. Riccia arnellii Khan The Bryologist 60 : 23-30 (1957).

Thallus thin, pale green, dorsal surface porous, sporophyte ventral, spore tetrahedral, papillose. Grows on damp soil, often on paddy land after harvesting.

Specimens examined: **Jamalpur:** Melandaha, Mirza Azam college, Sujan, 29.12.2001, No. 129. **Kishoreganj:** Nikli college campus, Rafiqul, 25.12.2000, No. 36. **Mymensingh:** Boroikandi, Rupshi, Phulpur, Delowar, 5.2.2000, No. 118. **Netrokona:**

Near Purbodhala bazar, Sujan, 30.12.2001, No. 133. **Sherpur**: Sandhyakura, Runcitia, Zhinaigati, Khurshida and Sujan, 25.9.1997, No. 75. **Tangail**: Sakhipur Ansar training centre, Rubel, 6.1.2000, No. 22.

10. **Riccia bakshi** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 183-186 (1995).

Plant spongy, dorsal furrow indistinct, dorsal surface pitted, sporangia ventral, spores triangular or oval, wing crenate or dentate. Grows on shady damp or sandy soil.

Specimens examined: **Jamalpur**: Sthall, Kamruzzaman, May 1990, No. 839. **Tangail**: Palulipara, Kamruzzaman, Nov. 1985, No. 182.

11. **Riccia barabaidensis** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 63-66 (1995).

Thallus thin, scale absent, sporangia ventral, spore wall reticulate, wing crenate, not uniformly wide, tri-radiate marking absent. Grows on shady, damp soil.

Specimen examined: **Tangail**: Modhupur forest, near Barabaid, Syed Ahmadiya Yatimkhana, Kamruzzaman, July 1985, No. 3.

12. **Riccia billardieri** Mont. *et* Nees, Syn. Hep.: 602 (1846).

Thallus comparatively bigger, monoecious, sporophyte dorsal, spore winged, wing cart-wheel like. Common. Grows on damp soil, flower pots, rice fields, plinth of dwelling house and drying ditch.

Specimens examined: **Jamalpur**: Nandina bazar, Roksana, 25.10.1999, No. 11. **Kishoreganj**: Sadar Land office, Nilganj upazilla, Roksana, 15.10.2001, No. 85. **Mymensingh**: Botanical garden, Agriculture University Campus, Khurshida and Fattah, 5.3.1987, No. 15. **Netrokona**: Town, Baraghat bridge side, Gokul, 17.9.1992, No. 35. **Sherpur**: Banshardi, Ganopathi, Rakibur, 2.8.1983, No. 9. **Tangail**: Near Kalihati college, Shahabuddin, 25.2.1983, No. 6.

13. **Riccia cavernosa** Hoffm in Udar & Agarwal, J. Indian Bot. Soc. 64: 246-250 (1985).

Thallus thin, more or less woolly, air pores distinct, scales absent, sporangia ventral, spores shining brown, wing present. Grows on shady damp soil, road and pond sides.

Specimens examined: **Netrokona**: Dupaura, Kamruzzaman, Nov. 1991, No. 1463. **Tangail**: Santosh, Patulipara, Kamruzzaman, July 1985, No. 186.

14. **Riccia centroporii** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 236-240 (1995).

Colony compact, deep red or yellow at the centre, fleshy, more or less woolly, dorsal surface pitted, scale absent, sporangia ventral, spore isobilateral, spiny. Grows on shady damp soil, drying pond and ditches, also on sandy soil under direct sunlight.

Specimens examined: **Mymensingh:** On bank of Brahmaputra, Kamruzzaman, May 1989, No. 463. **Sherpur:** Near BDR Camp, Kamruzzaman, Oct. 1991, No. 743. **Tangail:** Elasin, on bank of Dhaleshwari, Kamruzzaman, Apr. 1988, No. 458.

15. ***Riccia crundwellii*** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 93-96 (1995).

Thallus greyish, linear, tubers present, sporangia ventral, spore wall reticulate, wing thin, narrow. Grows on shady, damp soil and in house gardens.

Specimen examined: **Tangail:** Shantikunja, Kamruzzaman, July 1988, No. 413.

16. ***Riccia crystallina*** L., Sp. Pl. 113 (1973).

Yellow or crystalline-green, fleshy, spongy, sporangia ventral, spores round to triangle, wing broad, crenate, tri-radiate marking distinct. Grows on shady damp soil, bank of canals, rivers and paddy fields.

Specimens examined: **Netrokona:** Hosainpur, on bank of river Mogra, Kamruzzaman, Mar. 1986, No. 170. **Tangail:** Kagmari, canal side, Kamruzzaman, Mar. 1987, No. 231.

17. ***Riccia discolor*** L. *et* L., Pugil. 4:1 (1832).

Thallus with distinct dorsal furrow, scales violet, purple or hyaline, sporangia dorsal, spores without wing, no tri-radiate mark. Grows on shady damp soil, brick roads and fallow lands.

Specimen examined: **Jamalpur:** Sharishabari bus stand, Kamruzzaman, Feb. 1985, No. 126.

18. ***Riccia fluitans*** L., Sp. Pl.: 1139 (1753).

Thallus ribbon-like, branched dichotomously, sporophyte ventral, pendulous, spores triangular without tri-radiate marks, spore wall regularly reticulate, wingless. Aquatic, free floating, or on shady damp soil of drying out water bodies.

Specimens examined: **Jamalpur:** Near railway station, Kalibari, Kendua, Rezaul, 2.1.1999, No. 29. **Kishoreganj:** Near Jhalua primary school, Jhalua bazar, Marina, 27.2.1996, No. 37. **Mymensingh:** Kachary ferry ghat, Char Ishwardia, Sujan, 28.3.1994, No. 48. **Sherpur:** Gidda Naryanpur, Sujan, 25.9.1997, No. 71. **Tangail:** Muktagacha Langrar bazar, Ashraful, 15.1.2000, No. 81.

19. ***Riccia frostii*** Aust., Bull. Torrey Bot. Cl. 6: 17 (1875).

Thallus form rosette, dioecious, female thallus fleshy, bigger than males, sporophyte ventral, spore triangular with tri-radiate marks, irregularly reticulate. Very common by the sides of rivers, beels, khals and ditches.

Specimens examined: **Jamalpur:** Jagannathganj ghat, Sunit, 2.12.1983, No. 50. **Kishoreganj:** Eidgah maidan, Sadar upazilla, Afroza, 2.12.1998, No. 25. **Mymensingh:** By the side of Brahmaputra river, Khurshida and Sujan, 3.2.1987, No. 13. **Netrokona :** Bank of river Mogra, Gokul, 5.3.2003, No. 193. **Tangail:** Kagmari Moulana Mohammad Ali college, Mahbulul, 5.2.2000, No. 109.

20. ***Riccia gangetica*** Ahmad, Curr. Sci. 11: 433 (1942).

Thallus fleshy, sporophyte dorsal, spore round, wall reticulate, wingless. Common on damp soil, specially in gardens and paddy fields.

Specimens examined : **Jamalpur:** Sharishabari college campus, Rezaul, 21.5.2000, No. 127. **Kishoreganj:** T&T office campus, Bajitpur, Marina, 21.12.1992, No. 79. **Mymensingh:** Doctorbari, Boroikandi, Phulpur, Sujan, 25.1.1987, No. 64. **Netrokona:** Durgapur college campus, Sujan, 2.12.1991, No. 20. **Sherpur:** Sadar upazilla complex, Sujan, 25.9.1997, No. 68. **Tangail:** Ghatail college, Sujan, 8.9.2000, No. 107.

21. ***Riccia gangulii*** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 116-119 (1995).

Thallus with brittle cilia, scales hyaline, sporangia dorsal, spore reticulate, wing smooth, wavy. Grows on shady damp soil and drying ditch.

Specimen examined: **Kishoreganj:** Near Gurudayal college, Hassan, Mar. 1987, No. 451.

22. ***Riccia gopalpurensis*** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 120-123 (1995).

Thallus in rosette colony or overlapping, scales absent, sporangia dorsal, spore wall reticulate, 9-12 areolae across dorsally, winged, tri-radiate marks distinct. Grows on shady damp soil in sunny locations and forest floor.

Specimen examined: **Tangail:** Gopalpur-Bhuapur road, Kamruzzaman, July 1985, No. 1.

23. ***Riccia hasnabadii*** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 124-127 (1995).

Thallus thin, scales absent, spore wall reticulate, 6-8 areolae across dorsally, wing crenate, tri-radiate marking absent. Grows on shady damp soil and forest floor.

Specimen examined: **Tangail:** Modhupur Sal forest, Barabaid, Kamruzzaman, July 1985.

24. ***Riccia jamalpurensis*** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 128-131 (1995).

Thallus bluish-green, scales prominent, spores roughly round, wall reticulate, 7-12 areolae across dorsally, wing highly wavy, tri-radiate marks not distinct. Grows on damp, sandy soil and in gardens.

Specimen examined: **Jamalpur:** Sharishabari, Kamruzzaman, Mar. 1988, No. 452.

25. **Riccia jamunii** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 202-206 (1995).

Thallus yellowish-green, scales scanty, mostly hyaline, few violet, sporangia ventral, somewhat pendulous, spores broadly triangular, wall reticulate, areolae 5-9 across dorsally. Grows on shady damp soil, roadside, fallow land, sandy soil and banks of rivers.

Specimens examined: **Jamalpur:** Sharishabari, Kamruzzaman, Nov. 1986, No. 274. **Netrokona:** Shikerpur, bank of river Mogra, Kamruzzaman, Oct. 1991, No. 1421. **Sherpur:** Goalpotti, Kamruzzaman, Oct. 1991, No. 1450.

26. **Riccia kagmariensis** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 132-135 (1995).

Thallus deep green, scales absent, sporangia dorsal, large, distinctly visible from dorsal surface, areolae 6-8, wing crenate, tri-radiate marks distinct. Grows on shady damp soil, bank of drying ditches and sandy banks of rivers.

Specimens examined: **Jamalpur:** Near Circuit House, bank of river Brahmaputra, Kamruzzaman, Mar. 1988, No. 461. **Tangail:** Kagmari, Kamruzzaman, Feb. 1988, No. 445.

27. **Riccia lingulata** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 207-211 (1995).

Thallus thin, truncate or tongue-like at apex, scales hyaline or violet, sporangia pendulous, spores yellowish-brown, more or less translucent, reticulation thin, wing crenate or finely dentate. Grows on shady damp soil, drying soil, fallow land, river bank and drying out river beds.

Specimens examined: **Mymensingh:** Haluaghat, Paglapara, Kamruzzaman, Mar. 1986, No. 233. **Netrokona:** Nagra, Kamruzzaman, Mar. 1986, No. 230. **Tangail:** Gopalpur, Kamruzzaman, Nov. 1986, No. 207.

28. **Riccia lunata** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 140-143 (1995).

Thallus fleshy, distinctly pitted, scale absent, sporangia ventral, 5-8 areolae across dorsally, wing crenate or finely dentate, perforated. Grows on shady damp soil.

Specimens examined: **Mymensingh:** Phulpur, Kamruzzaman, Apr. 1998, No. 438. **Tangail:** Korotia, Kamruzzaman, Apr. 1988, No. 432.

29. ***Riccia madhupurensis*** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 144-147 (1995).

Thallus thin, dorsal furrow shallow, sporangia ventral, spore wing crenate, areolae 7-9. Grows on shady damp soil, rich in organic matter, decaying substratum.

Specimens examined: **Mymensingh:** Muktagachha, on Highway side, Kamruzzaman, Nov. 1985, No. 156. **Tangail:** Modhupur, Kamruzzaman, Oct. 1985, No. 142.

30. ***Riccia marsupiformis*** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 212-215 (1995).

Thallus woolly, dorsal surface highly pitted, sporangia deeply pendulous (pouched), pear-shaped, spore wall reticulation thin. Grows on shady damp soil.

Specimen examined: **Tangail:** On bank of Patulipara canal, Kamruzzaman, Jan. 1985, No. 185.

31. ***Riccia mogransis*** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 148-151 (1995).

Thallus with upper epidermal cells hyaline and characteristically crescent-shaped, scales hyaline, sporangia dorsal, spores golden-brown, 6-8 areolae across dorsally, winged with one perforation at each corner. Grows on shady damp soil, brick and river embankments.

Specimen examined: **Netrokona:** Near Mogra embankment, Kamruzzaman, Mar. 1986, No. 231.

32. ***Riccia nathurcharensis*** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 152-155 (1995).

Thallus light green, sporangia ventral, spore wall reticulate, irregular, 5-7 areolae across dorsally, wing wavy. Grows on damp soil.

Specimen examined: **Tangail:** Mirzapur-Mohonpur Road, Nathurchar, Kamruzzaman, July 1985, No. 2.

33. ***Riccia parvullii*** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 156-159 (1995).

Thallus very small, unbranched, scale hyaline and pinkish-brown, sporangia dorsal, spores few, wall vermiculate dorsally, reticulate ventrally. Grows on shady damp soil, jute field and house garden.

Specimen examined: **Tangail:** Kagmari, Kamruzzaman, July 1985, No. 8.

34. ***Riccia perssonii*** Khan, Svensk. Botanisk. Tids. Bd. 49: 433 (1955).

Thallus spongy, dorsal surface porous, dioecious, sporophyte ventral, spore isobilateral, papillose. Common on damp soil of paddy fields, sides of ditches and rivers.

Specimens examined: **Jamalpur:** Near railway station, Nandina, Roksana, 15.12.2001, No. 37. **Kishoreganj:** Tarail, Baruha Munna, 25.5.2003, No. 195. **Mymensingh:** Shankipara, Tinkona Pukurpara, Sujan, 24.12.2001, No. 120. **Netrokona:** Birishiri Tribal Cultural Institute, Khurshida and Fattah, 27.2.1994, No. 41. **Sherpur:** Runtia, Zhinaigati, Khurshida and Sujan, 25.9.1997, No. 74. **Tangail:** Bharetswari Home, Mirzapur, Fazlul, 5.12.1994, No. 35.

35. **Riccia plana** Tayl., J. Bot. London: 414 (1846).

Thallus thin, linear, scale hyaline and purplish, sporangia ventral, sometimes slightly pendulous, spores mostly triangular, wall reticulate, wing thin, crenate with one perforation at the corner. Grows on shady damp and sandy soil.

Specimens examined: **Netrokona:** Bank of river Mogra, Kamruzzaman, Nov. 1987, No. 299. **Tangail:** Patulipara, Kamruzzaman, Nov. 1987, No. 297.

36. **Riccia sharishabariensis** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 218-222 (1995).

Thallus linear, thick, scales hyaline, sporangia pendulous, spores triangular, rarely quadrangular, wall reticulate, highly crenate. Grows on shady damp soil, fallow lands and river banks.

Specimens examined: **Jamalpur:** Sharishabari, on canal side, Kamruzzaman, Oct. 1985, No. 55. **Kishoreganj:** Pakundia, roadsides, Kamruzzaman, Mar. 1991, No. 1192.

37. **Riccia sorocarpa** Bisch., Nov. Acta Acad. Nat. Cur. 17: 1053 (1835).

Thallus overlapping or in rosette, scales hyaline, sporangia ventral, spore wall reticulate, projecting like ridges, winged, wavy. Grows on shady damp soil, river banks, char land and latterite soil.

Specimen examined: **Tangail:** Shakhipur, Kamruzzaman, Dec. 1987, No. 309.

38. **Riccia sultanii** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 223-224 (1995).

Thallus deep green, scales hyaline, also violet, rhizoid vermiculate, sporangia ventral, sometimes pendulous, spores yellowish to golden-brown, wall reticulate, wing crenate, perforated. Grows on shady damp soil, garden, pond and roadsides.

Specimen examined: **Tangail:** College, Kamruzzaman, Mar. 1988, No. 415.

39. **Riccia tangailensis** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 172-175 (1995).

Thallus fleshy, sporangia ventral, spore yellowish to brown, up to 6 areolae across dorsally, wing wavy, crenate, perforated. Grows on shady damp soil, house garden and hillocks.

Specimen examined: Tangail: Gorai Hill, Kamruzzaman, Feb. 1986, No. 439.

40. **Riccia tubulosa** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 176-179 (1995).

Thallus olive-green, small, linear, scale absent, sporangia dorsal, wall reticulation irregularly branched, wing smooth. Grows on damp and sandy soil and river banks.

Specimen examined: Tangail: Near Elashin ghat, bank of river Dhaleshwari, Kamruzzaman, Nov. 1987, No. 244.

41. **Riccia varientis** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 246-249 (1995).

Thallus greyish-green to yellowish-green, sporangia ventral, many, clearly visible from both dorsal and ventral sides, spores rhomboidal, tetrahedral and isobilateral in the same sporangium, spores permanently attached in tetrad, with spines all over the surface. Grows on shady damp soil and drying fallow lands.

Specimens examined: Jamalpur: Bank of river Brahmaputra, near ferry ghat, Kamruzzaman, Mar. 1989, No. 44. **Mymensingh:** Near Circuit house, Hadiuzzaman, Feb. 1989, No. 438. **Tangail:** Bhabanipur, Elenga, Kamruzzaman, Feb. 1988, No. 426.

42. **Riccia vulgaris** Zaman *et* Syed, Studies on the genus *Riccia* of Bangladesh, Ph.D. Thesis: 225-229 (1995).

Thallus deep to light green, scales rudimentary, hyaline, sporangia highly pendulous, spores roughly triangular, wing wavy, perforated at corners. Grows on shady damp soil.

Specimens examined: Jamalpur: Sharishabari, Kamruzzaman, Feb. 1985, No. 14. **Tangail:** Nathurchar, Gopalpur, Kamruzzaman, Feb. 1984.

Genus: Ricciocarpus Corda in Opiz. (ed.), Natural. (12).

(Beitr. Z. Nat. (1): 651 (1929).

43. **Ricciocarpus natans** (Linn.) Corda in Opiz. Beitr. Zur. Nat. 12: 651 (1829).

Aquatic, free floating or terrestrial. Thallus broadly obovate, lobes with long, pendent sword-like, violet, serrated scales on the ventral surface, aquatic forms generally sterile, terrestrial forms fertile, scales greatly reduced. Grows on beels, ponds, paddy fields and fallow lands.

Specimens examined: Jamalpur: Kalibari, Kendua upazilla, Bikash, 5.3.1995, No. 44. **Kishoreganj:** Floating on Bohera beel, Tarail, Ashutosh, 5.11.1993, No. 85. **Mymensingh:** Kakchar beel, Bishka, Phulpur, Narayan, 5.9.1983, No. 20. **Netrokona:** Rajdha beel, Purbadhala, Shovon, 5.10.2000, No. 69. **Tangail:** Dikpait, Dhanbari, Modhupur, Roksana, 12.2.1994, No. 30.

Order: Metzgeriales; Family: Pallaviciniaceae;**Genus: Pallavicinia** S. Gray., Nat. Arr. Brit. Pl. 1: 679, 775 (1821).44. **Pallavicinia** sp.

Thallus long, narrow with distinct midrib, branches monopodial, midrib multi-layered, wings 1-layered thick, only smooth rhizoid and scales present. Grows on wet, damp soil, found mostly on slopes of small hills.

Specimens examined: **Jamalpur:** Near picnic spot, Kornojhura, Sribordi, Sujan, 10.3.2003, No. 184. **Sherpur:** Gazni picnic spot, Zhinaigati, Khurshida and Sujan, 25.9.1997, No. 56.

Class: Anthocerotopsida; Order: Anthocerotales; Family: Anthocerotaceae;**Genus : Anthoceros** L., Sp. Pl.: 1139 (1753).45. **Anthoceros crispulus** (Mont.) Douin., Rev. Bryol. 32: 27 (1905).

Monoecious, thallus bright green, scattered or form rosette, thallus margin incised or lobed, dorsal surface velvety or powdery due to presence of many leaf-like lobed lamellae, mucilage cavities large, spores hispid with spines, dark brown to black.

Specimens examined: **Jamalpur:** Deb Bari, Kalibari, Kendua, Sujan, 25.12.1995, No. 61. **Mymensingh:** Muktagachha, Shovon, 12.2.1998. **Sherpur:** Gazni, Sujan, 10.12.1995, No. 54.

46. **Anthoceros fusiformis** Aust., Ann. Bot. 38: 473-483 (1924).

Monoecious, thallus rough with ridges, dark-green, large mucilage cavities present, *Nostoc* colonies abundant, can be seen from dorsal and ventral surfaces with naked eyes as circular black spots, sporophytes comparatively long, spores black, papillose. Grows on shaded, damp soil, crevices and sides of rivers.

Specimen examined: **Mymensingh:** Slopes of Brahmaputra river, Agriculture University Campus, Khurshida and Sujan, 10.3.1995, No. 69.

47. **Anthoceros laevis** L., Ann. Bot. 38: 105-111 (1907).

Dioecious, thallus dark green, smooth, margin crispulate, large mucilage cavities absent, spores smooth, yellow. Grows on damp, shaded soil and slope of rivers.

Specimens examined: **Jamalpur:** Sharishabari, Rezaul, 10.2.1994. **Mymensingh:** Shaheb park, Khurshida and Sujan, 10.2.1992, No. 52. **Tangail:** Madhupur, Hadiuzzaman, July 1980.

Family: Notothyladaceae;**Genus: Notothylas** Sull. in A. Gray, Amer. J. Sci. Arts 51: 74 (1846).48. **Notothylas indica** Kashyap, Proceed. Lahore Philosoph. Soc. 4: 54 (1925).

Monoecious, thallus green, single or in dense overlapping patches, often forming rosette, *Nostoc* colonies abundant, can be seen in naked eyes, sporophytes cylindrical, borne horizontally along the lobes, young sporophytes yellow, black at maturity, often completely enclosed within involucre or projected beyond it, columella well-developed, spores opaque, dark brown, minutely granular.

Specimens examined: **Jamalpur:** Near picnic spot, Karnajhura, Sribordi, Sujan, 11.9.2000, No. 110. **Mymensingh:** On crevices of Brahmaputra river, Shaheb bazar park, Khurshida and Sujan, 5.11.1996, No. 70. **Sherpur:** Upazilla complex, Sujan, 9.3.2003, No. 182.

References

- Banu, K. 1991. Taxonomic studies on the Acrocarpous Mosses of Bangladesh. Ph. D. Thesis, Department of Botany, University of Dhaka. 460 pp.
- Banu-Fattah, K. 1998. Bryophytic Flora of Chittagong in Bangladesh. Bangladesh J. Plant Taxon. **5**(2): 83-89.
- Banu-Fattah, K. and Sarker, S.K. 2007. Bryophyte flora of greater Mymensingh district of Bangladesh - Class: Bryopsida. Bangladesh J. Plant Taxon. **14**(1): 47-66.
- Hadiuzzaman, S. 2007. Class: Hepaticopsida and Anthocerotopsida. In: Siddiqui, K.U., Islam, M.A., Ahmed, Z.U., Begum, Z.N.T., Hassan, M.A., Khondker, M., Rahman, M.M., Kabir, S.M.H., Ahmad, M., Ahmed, A.T.A., Rahman, A.K.A. and Haque, E.U. (eds.). Encyclopedia of Flora and Fauna of Bangladesh, Vol. **5**. Bryophytes, Pteridophytes, Gymnosperms. Asiatic Society of Bangladesh, Dhaka. pp. 1-38.
- Hadiuzzaman, S. and Chakravarty, A. 1981. Marchantiales of Bangladesh. Bangladesh J. Bot. **10**(1): 63-81.
- Hadiuzzaman, S. and Chakravarty, A. 1983. Anthocerotae of Bangladesh. Bangladesh J. Bot. **13**(1): 101-107.
- Kamruzzaman, M. 1995. Studies on the genus *Riccia* of Bangladesh. Ph. D. Thesis, Department of Botany, University of Dhaka. 272 pp.
- Khan, S.A. 1955. *Riccia perssonii* S. A. Khan: A new and interesting species from East Pakistan. Svensk Botanik Tidskrift. Bd. 49 H. 3: 433-436.
- Khan, S.A. 1957. Studies in Ricciaceae of East Pakistan: New and little known species of *Riccia*. The Bryologist **60**: 28-32.
- Tixier, P. 1967. Bryophytae Indosinicae. The Dacca University Studies. XV, Part B: 1-12.

(Manuscript received on 20 July 2009; revised on 16 May 2010)