

**PLEUROCARPOUS MOSSES OF BANGLADESH :
FAMILY - SEMATOPHYLLACEAE**

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Abstract

A taxonomic account of eight species of pleurocarpous mosses from different localities of Bangladesh has been made. These are new addition to the pleurocarpous moss flora reported earlier.

Introduction

In previous reports (Khatun and Hadiuzzaman 1994, 1995, 2003, 2004a,b, 2005a,b, 2006a,b) 42 species under 25 genera of pleurocarpous mosses were described. Recently, Banu-Fattah (2005) reported *Distichophyllum schmidtii* Broth., a species of pleurocarpous moss, which is rare in Bangladesh and was collected only by Sinclair (1955). In this paper altogether eight species under six genera of the family Sematophyllaceae under the order Hypnobryales have been reported. The species are *Glossadelphus zollingeri*, *Taxithelium nepalense*, *Acanthorrhynchium papillatum*, *Trichosteleum boschii*, *T. stissophyllum*, *Aptychella delicata*, *A. borii*, and *Acroporium baviense*. The present study reveals that among the above mentioned species *Taxithelium nepalense* is quite common and has been collected from 53 districts of Bangladesh, which is abundant in rainy season and mostly found on bark of trees. Tixier (1967) in his checklist mentioned only *Taxithelium nepalense* from the family Sematophyllaceae. Gangulee (1980) described all the above mentioned species in his "Mosses of Eastern India and adjacent regions" but he did not give any information on their occurrence in Bangladesh. He only mentioned about the species *T. nepalense* of Tixier's collections (from Chittagong, Bangladesh). In the present paper detailed taxonomic descriptions, illustrations and distributions along with keys to the genera and species and a short note on each taxon are provided. Except *T. nepalense* all the above mentioned species are new records for Bangladesh.

Key to the genera of Sematophyllaceae:

1. Leaf cells papillose 2
 - Leaf cells non-papillose 5
2. Papillae restricted at only on top of leaf extending into sharp papillae *Glossadelphus*
 - Papillae not restricted at top of the leaf 3
3. Papillae usually finely seriate, alar cells quadrate to rectangular, enlarged but not inflated *Taxithelium*
 - Papillae only one on the lumen of the cell, alar cells not quadrate to rectangular, cells not enlarged but inflated 4
4. Leaf ovate-lanceolate, leaf cells rhomboidal at apex, alar differentiated by several large, inflated, ovate-oblong cells at corner of which the extreme one is very much inflated *Acanthorrhynchium*
 - Leaf elliptico-lanceolate, leaf cells elongated-rhomboid at apex, alar differentiated by two or one row of large inflated oblong cells with a few smaller, irregular cells above *Trichosteleum*
5. Alar cells prominent in lower row, leaf base cordate, auriculate, cells prosenchymatous, basal cells usually thick-walled and pitted *Acroporium*

- Alar cells not so, but numerous, rectangular, leaf base not cordate or auriculate, basal cells usually thin walled and not pitted

Aptychella

GENUS GLOSSADELPHUS Fleisch. in Musci Fl. Buitenz., 4 : 1351 (1923)

Dioicous, medium sized plants in glossy flat mats. Main stem regularly or irregularly pinnately branched, branches short, complanate, blunt. Leaves oblong to ovate-lanceolate, apex mostly rounded but rarely sub-acute, crenulate to distinctly toothed towards the apex, dorsal and ventral leaves usually narrower than lateral ones, leaves somewhat asymmetric. Costa short and double. Leaf cells linear, mostly with papillose extension of tips, thick-walled. Extreme basal cells usually larger and wider but alar may not be differentiated.

Glossadelphus zollingeri (C. Muell.) Fleisch. Musci Fl. Buitenz, 4:1355 (1923) (Pl. 1)

Hypnum zollingeri C. Muell. In Syn., 2: 241 (1851)

Ectropothecium filicaule Fleisch. In Hedwigia 44: 326 (1905)

Glossadelphus nanophyllus Sak. Bot. Mag. Tok., 46 : 748 (1932)

Yellow-green to brownish, glossy plants in flat mats, sometimes variable. Main stem creeping, more or less pinnate branching, giving rise to short, spreading branches, branches complanate. Stem leaves and branch leaves similar but branch leaves slightly narrower than stem leaves. Leaves spreading, patent when dry, ovate, acuminate c. 0.70 × 0.3 mm, sometimes variable, margin faintly denticulate at tip, sometimes recurved in both sides at middle of leaf, apex more or less acute. Costa short, double, unequal. Leaf cells narrow-rhomboid, c. 42 × 8 μm at middle, sometimes larger, c. 27.75 × 6.75 μm at tip, most cell apices show papillose development making leaf surface rough, basal row of cells smooth, hyaline, larger sub-rectangular, c.30.5 × 10.2 μm, cells at extreme alar slightly curved.

Specimens examined: Chittagong: Hazarikhil, on bark of tree, Md. Shah Alam, Mar.1964, **158**; *Shariatpur:* Goshairhat, on soil, Hassan Ali, Oct. 2000, **1325**; *Sylhet:* Lawacherra forest, on bark of tree, Mahbubur Rahman, Eradul Haque, Md. Abdul Awal Sarker and A.N.M. Rubaiyath Rahman, Oct.1996, **371**.

Note: Leaves ovate, apex more or less acute, costa short, double, papillae by the elongation of cell tips are some distinguishing characters of this species.

GENUS TAXITHELIUM Spruce. ex Mitt. J. Linn. Soc. Bot., 12 : 21-496 (1869)

Plants slender to medium sized, green to yellowish or golden green, corticolous, flat mats, more or less pinnate branched, branches small, usually complanate. No paraphyllia. Main stem leaves and branch leaves more or less similar, concave, the dorsal and ventral leaves appressed, lateral leaves larger, spreading and often somewhat asymmetric, oblong-ovate or ovate-lanceolate, usually acute with short acumen, enervate or nearly so, cells linear, margin mostly dentate at top. Leaf cells linear seriate papillose over the lumina, shorter and broader at the base, nearly always differentiated at the basal angles and without papilla. Seta elongate, mostly smooth. Capsule inclined to horizontal, ovoid, sometimes curved and contracted below the mouth. Calyptra cucullate. Peristome normal, double, basal membrane high.

Taxithelium nepalense (Schwaegr.) Broth. in Monsunia 1:51 (1899) (Pl. 2)

Hypnum nepalense Schwaegr. In sp. Musc.. Supple. 3(1): 226 (1828)

Trichosteleum turgidellum (C. Muell.) Kindb. in Enum. Bryin. Exot.: 104 (1891)

Taxithelium turgidellum (C. Muell.) Par. in Index Bryol. ed. 2, 4:358 (1905)

Monoicous, robust, small to medium sized plants, shiny, yellow-green, becoming shiny light brown or golden-green when old. Main stem long, creeping irregularly, often regularly pinnate, widely spreading, erect or ascending and of unequal heights, terete or sometimes slightly

complanate, more or less 3 cm long and 0.9 cm wide with leaves. Leaves dense, erectopatent, appressed to stem when dry, broadly ovate, concave with acute tip, more or less 1 mm long and 0.5 mm wide, no denticulation at basal portion but margin dentate at tip, flat. No costa. Leaf cells spindle shaped, contain single row of very distinct papillae, 6 to 8 papillae in each cell, c. $50 \times 8 \mu\text{m}$ at middle but cells at extreme tip and extreme basal portion short, c. $35.5 \times 10.4 \mu\text{m}$, alar cells larger, wider and rectangular, sometimes quadrate, c. $20 \times 15 \mu\text{m}$, some extreme tip cells, alar cells smooth, supra alar cells irregularly quadrate or elongated, numerous, extending obliquely up margin, cell wall thin, not porose. Basal cells slightly wider and papillae larger. Sporophyte usually on main stem and also on branch stem. Perichaetial leaves long, erect, narrow, sharply serrate with papillae, long filiform, acuminate, c. 2 mm long. Seta erect. Capsule inclined to horizontal, curved, constricted under mouth when dry, oval, c. 1.3 mm long and 0.5 mm in diameter, smooth, brown. Operculum conical, apiculate. Calyptra cucullate. Peristome double, hypnoid, c. $350 \mu\text{m}$ high, cilia single, basal membrane high. Spores c. 15 to $18 \mu\text{m}$ in diameter, smooth, light brown in colour. Exothecial cells large, smooth, rectangular, thick-walled, small and transversely rectangular at mouth of capsule.

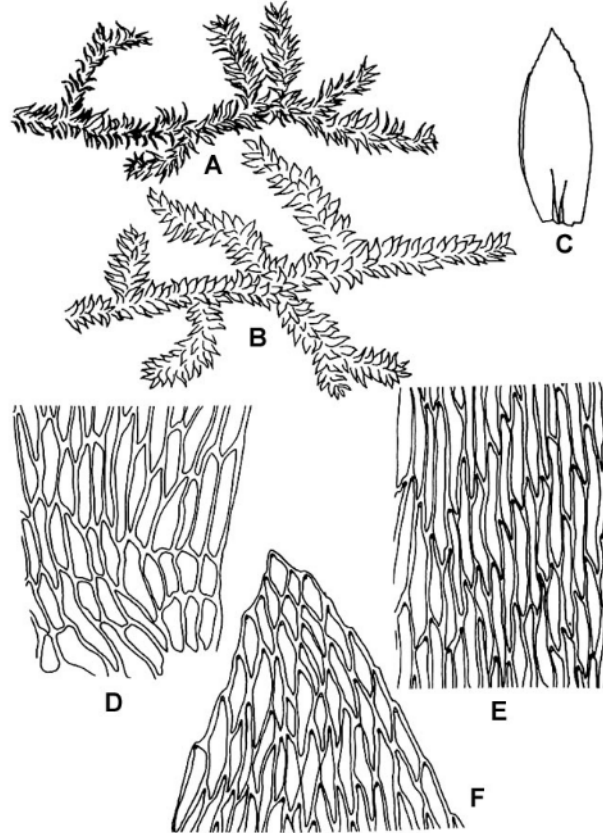


Plate 1. *Glossadelphus zollingeri* (C. Muell.) Fleisch. A. Dry plant ($\times 5$), B. Wet plant ($\times 5$), C. Leaf ($\times 18$), D. Basal laminal cells ($\times 225$), E. Middle laminal cells ($\times 225$), F. Apical laminal cells ($\times 225$).

Specimens examined: The members of this species are widely distributed all over the country. However, populations were found in abundance in the following localities: **Bagerhat:** Rampal, on bark of tree, A.S.M. Asadur Rahman, Aug.1998, **439**; **Barisal:** Amtoli, on bark of tree, Abdul Awal Sarker, June-1996, **740**; **Chittagong:** Potenga BAF base, on bark of tree, Hamida Khatun,

May-1996, **545**; **Gazipur**: Sripur, on bark of tree, Hamida Khatun, July-1998, **584**; **Mymensingh**: City park, on base of tree, Hamida Khatun, Oct.1997, **327**.

Note: The species is distinguished by its ovate-lanceolate, short-acuminate leaf, cells with several small papillae in one row over the lumen.

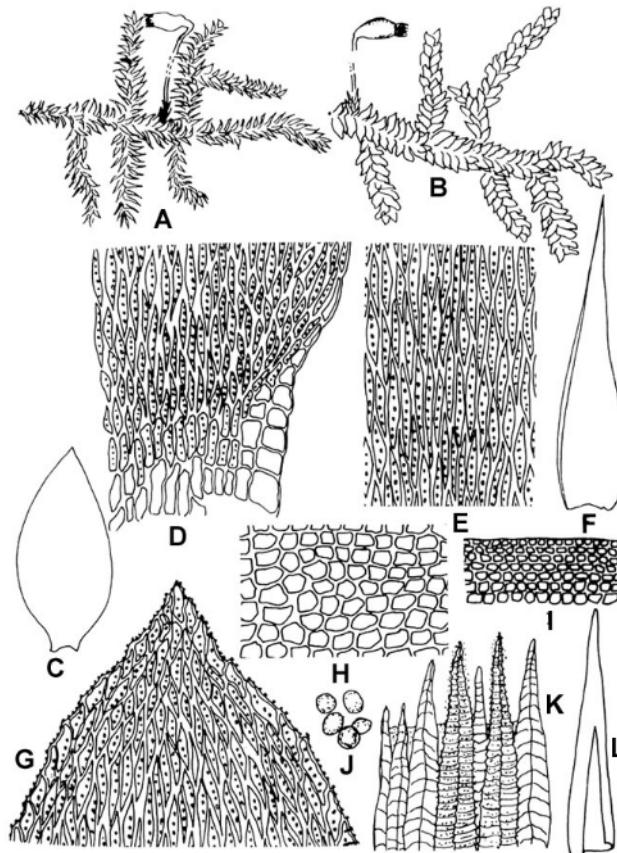


Plate 2. *Taxithelium nepalense* (Schwaegr.) Broth. A. Dry plant ($\times 5$), B. Wet plant ($\times 5$), C. Leaf ($\times 18$), D. Basal laminal cells ($\times 135$), E. Middle laminal cells ($\times 135$), F. Perichaetial leaf ($\times 18$), G. Apical laminal cells ($\times 135$), H. Exothecial cells of the capsule ($\times 150$), I. Mouth cells of the capsule ($\times 150$), J. Spores ($\times 225$), K. Peristome teeth ($\times 135$), L. Calyptra ($\times 18$).

GENUS ACANTHORRHYNCHIUM Fleisch. in Musci Fl. Buitenz., 4 : 1331 (1923)

Plants slender, forming mats. Main stem creeping, pinnately branched. Leaves ovate-lanceolate, acuminate, ecostate, dentate at upper portion. Leaf cells rhomboidal on top, thick-walled, unipapillate on centre of lumen, alar distinct with large and inflated cells. Seta long, slender. Capsule horizontal, peristome double, normal.

Acanthorrhynchium papillatum (Harv.) Fleisch. in Musci Fl. Buitenz., 4 : 1331, 216 (1923)

Hypnum papillatum Harv. In Hook.: Icon. Pl. Rar., 1. 23 (1836)

(Pl. 3)

Trichosteleum papillatum (Harv.) Jaeg in Ber. S. Gall. Naturw. Ges. 1876-77 : 417 (1878)

Taxithelium papillatum (Harv.) Broth. in Bot. Tidskr., 24 : 123 (1901)

Dioicous, slender, yellow-green to green glossy plants forming mats. Main stem creeping, 15 cm long, branching pinnate and short. Leaves dense, erectopatient, ovate-lanceolate, suddenly

narrowed to form a narrow acuminate point, c. 1.25×0.3 mm, narrowed at base, margin smooth or faintly denticulate, costa absent. Leaf cells rhomboid at apex, c. 35×5 μ m with one large central papilla. Alar differentiated by row of large, inflated ovate oblong cells, extreme corner sometimes found to be very much inflated, c. 60×45 μ m, yellowish, sometimes hyaline, top alar cells irregular, finally merging with cells above, middle cells more or less rhomboidal with one large central papilla. Papillae on each side of the lumen making the surface specially the back rough. Sporophyte on main stem. Seta erect. Capsule ovate. Peristome normal, double, exostome and endostome more or less same in height.

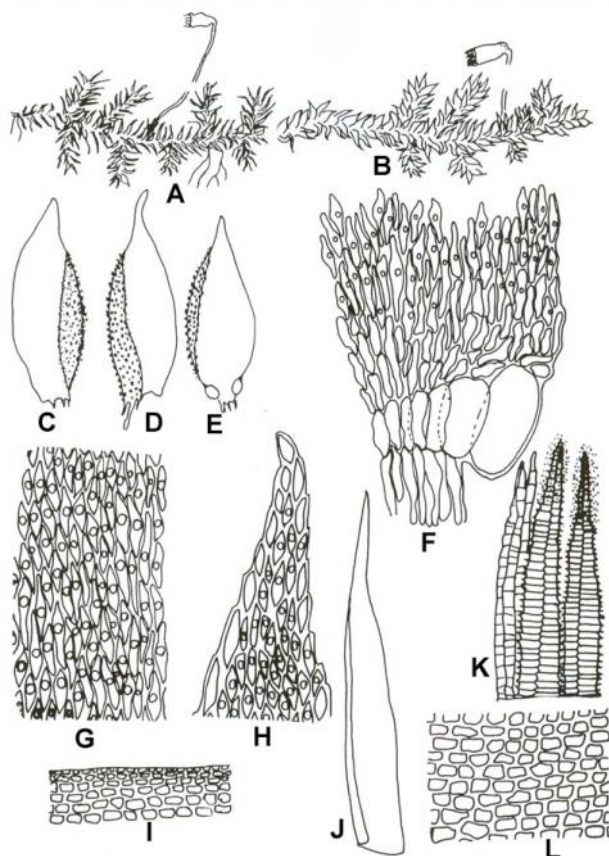


Plate 3. *Acanthorrhynchium papillatum* (Harv.) Fleisch., A. Dry plant ($\times 5$), B. Wet plant ($\times 5$), C-E. Leaves ($\times 18$), F. Basal laminal cells ($\times 135$), G. Middle laminal cells ($\times 135$), H. Apical laminal cells ($\times 135$), I. Mouth cells of the capsule ($\times 150$), J. Perichaetial leaf ($\times 18$), K. Peristome teeth ($\times 135$) and L. Exothecial cells of the capsule ($\times 150$).

Specimen examined: Maulvi Bazar: Srimangal, Lawacherra Forest, on bark of tree, Quazi Abdul Fattah, Khurshida Banu-Fattah and Shafaet Ahmed Khan, Oct. 1988, **328**.

Note: This species is characterized by its ovate-lanceolate, narrow acuminate leaves. Leaf cells uni-papillate on centre of lumen, cells rhomboidal at top, alar cells large, tinted, ovate-oblong, corner most cells found to be very much inflated.

GENUS *TRICHOSTELEUM* Mitt. in J. Linn. Soc. Bot. 18 : 181 (1868)

Monoicous, medium to slender plants in flat mats, densely and irregularly to sub-pinnately branched, branchlets short. Leaves often falcato-secund, ovate-lanceolate, long-acuminate, often

faintly toothed or serrate towards apex, enervate, cells mostly thin walled and elliptic, mostly unipapillose rarely bipapillose over the lumina, alar differentiated by large, hyaline or yellow inflated cells. Seta slender, slightly papillose above. Capsule sub-cylindric. Peristome generally double, perfect, cilia absent. Operculum acicular, rostrate. Calyptra cucullate. Spores usually small.

Key to the species of *Trichosteleum*

1. Leaf tip gradually long acuminate, subulate, apex sometimes hooked, margin smooth or faintly denticulate. Alar differentiated by a row of large, oblong, inflated, tinted cells at extreme angles *T. boschii*
- Leaf tip narrow acute, apex not subulate and hooked, margin dentate at upper part. Alar distinguished by two large, inflated, oblong cells *T. stissophyllum*

Trichosteleum boschii (Doz. & Molk.) Jaeg. in Ber. S. Gall. Naturw. Ges., 1876-77 (1878) (Pl. 4)
Hypnum boschii Doz. & Molk. in Ann. Sc. Nat. Bot. Ser. 3, 2 : 306 (1844)
Stereodon brachypelma (C. Muell.) Mitt. in Musc. Ind. Or. : 102 (1859)
Trichosteleum brachypelma (C. Muell.) Par. in Index Bryol. : 656 (1897)
T. basilanense Broth. in Philipp. J. Sci., 13 : 220 (1918)

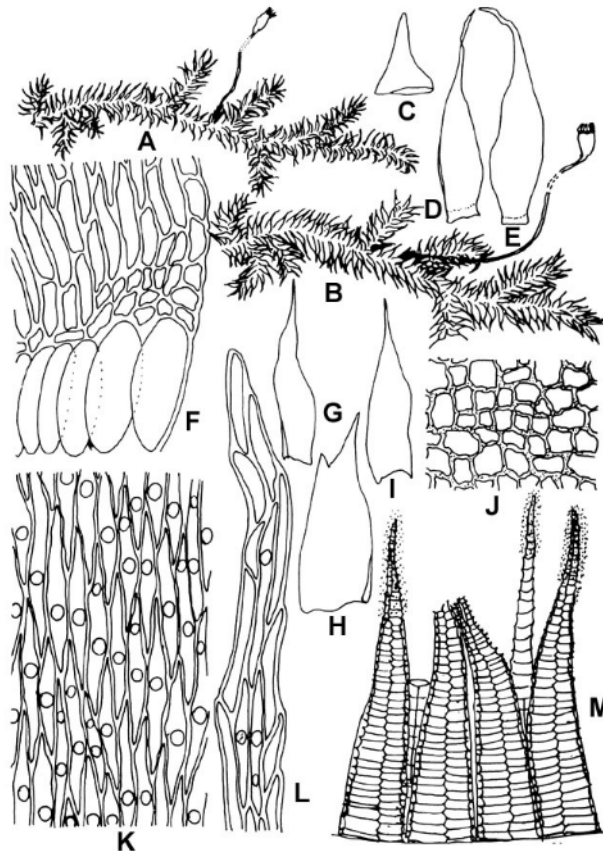


Plate 4. *Trichosteleum boschii* (Doz. & Molk.) Jaeg. A. Dry plant ($\times 5$), B. Wet plant ($\times 5$), C. Operculum ($\times 18$), D, E. Leaves ($\times 18$), F. Basal laminal cells ($\times 337$), G-I. Perichaetial leaves ($\times 18$), J. Exothecial cells ($\times 100$), K. Middle laminal cells ($\times 337$), L. Apical laminal cells ($\times 337$), M. Peristome teeth ($\times 100$).

Medium sized, yellow-green, shiny plants in low tufts, on bark. Main stem creeping, branches sparse and irregularly pinnate, laxly ascending, complanate, foliate, up to 1.5 cm long and 0.5 cm wide with leaves. Leaves spreading, erectopatent, concave, elliptico-lanceolate, apex gradually long acuminate, sometimes curved, c. 1.12×0.25 mm, margin smooth, faintly denticulate above. Costa absent. Leaf cells rhomboid-elliptic, c. 28.22×4.12 μm at middle, with one papilla on centre of the lumen, tip cells c. 40.1×3.9 μm , extreme basal cells c. 72.6×36.3 μm , tip cells and basal cells lack papilla. Alar differentiated by a row of large, oblong, inflated, tinted cells at extreme angles, up to c. 72.6×36.3 μm , with some smaller irregular cells above. Sporophytes on main stem, perichaetial leaves narrow, lanceolate, erect, c. 1.10 mm long, subulate, leaf cells and margin smooth. Seta erect, slender, c. 1.4 cm long, dark brown in colour. Capsule horizontal to drooping, sometimes erect, small, ovate, c. 0.45×0.5 mm, smooth, dark golden-brown in colour. Mouth and exothecial cells irregularly quadrate to rectangular and collenchymatous, up to 42.66×26.66 μm . Peristome normal, double, upto 0.25 mm high and light golden-brown in colour, upper portion papillate. Spores smooth, green, irregularly rounded to oval, c. 22 μm in diameter.

Specimen examined: **Chittagong:** Hazarikhil, on bark of tree, Razia Begum, Parveen Sultana, Mar. 1976, **478**.

Note: The species is characterized by its concave, elliptico-lanceolate leaf, long acuminate, subulate tip, hooked apex, unipapillate leaf cells, linear to elliptic, alar with one row of large, oblong cells at extreme angles.

Trichosteleum stissophyllum (Hamp.) Jaeg. in Ber. S. Gall. Naturw. Ges., 1876-77 : 417 (1878)
Hypnum stissophyllum Hamp. in C. Muell.: Syn., 2: 273 (1851) **(Pl. 5)**
Stereodon stissophyllus Mitt. in Musci Ind. Or., 101(1859)

Monicous, medium sized, yellow-green, shiny, corticolous plant. Main stem creeping, elongated with more or less regularly pinnately branched, branches complanate, foliate, more or less 1.5 cm long and 0.5 cm broad with leaves. Leaves dense, erectopatent, slightly concave, elliptico-lanceolate, apex gradually acute, c. 1.01×0.30 mm, margin denticulate at upper part. No costa. Leaf cells elliptic-rhomboid, c. 39.6×9.24 μm at tip, middle cells irregularly narrow rhomboid, c. 48.84×10.56 μm , with a central papillae on the lumen of cells. Papillae absent at basal cells and extreme tip, cells are thin-walled, non porous, basal cells slightly shorter than middle cells, c. 36.3×0.25 μm , alar distinguished by two large, inflated, oblong cells, c. 49.5×29.7 μm at extreme angle with some smaller irregular cells above it. Branch and stem leaves more or less similar but branch leaves slightly smaller in size. Sporophyte on main stem. Seta erect, c. 0.6 to 1.0 mm long, lightly papillose on top, smooth at base, dark-brown in colour. Perichaetial leaves narrow-lanceolate, erect, long acuminate, margin dentate at top. Capsule horizontal to drooping, ovate cylindric, c. 80×40 μm long. Mouth cells irregularly quadrate, small, exothecial cells irregular in shape and collenchymatous. Operculum long-rostrate. Peristome normal, double, brown in colour. Spores faintly papillose, brownish-yellow, irregularly rhomboid to oval, c. 1.5 μm in diameter.

Specimen examined: **Maulvi Bazar:** Lawacherra forest, on bark of tree, Quazi Abdul Fattah, Khurshida Banu-Fattah and Shafaet Ahmed Khan, Oct. 1988, **15**.

Note: This species is distinct in having leaves with narrow acute apex and alar distinguished by two large inflated, oblong cells at extreme angle.

GENUS **APTICHELLA** (Broth.) Herz. in Biblioth. Bot., 87: 157 (1916)

Moderately robust, glossy plants. Main stem creeping or prostrate, brownish-green, irregularly branched. Leaves somewhat concave, ovate-lanceolate, usually acuminate, entire, nerve short, double or lacking, cells linear, coloured above the insertion, alar cells differentiated.

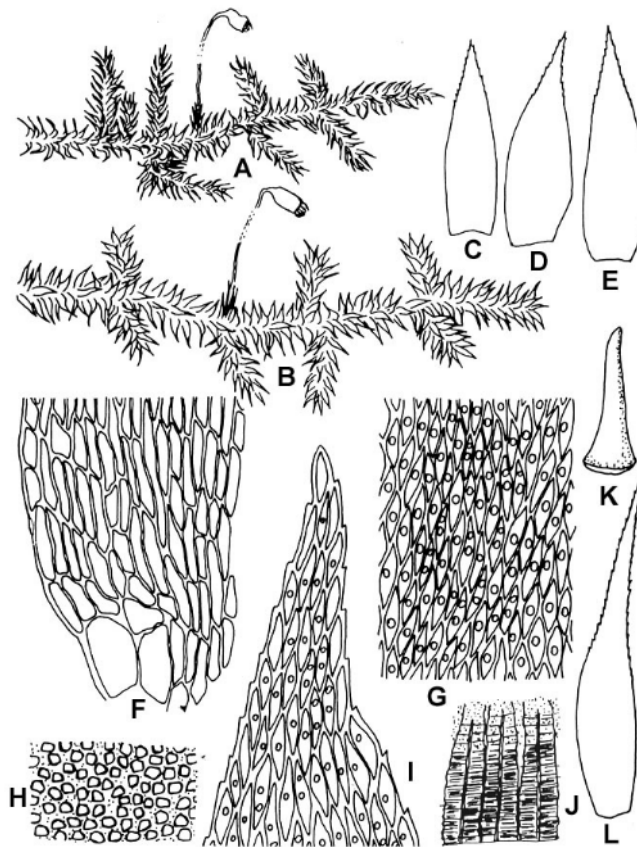


Plate 5. *Trichosteleum stissophyllum* (Hamp.) Jaeg. A. Dry plant ($\times 5$), B. Wet plant ($\times 5$), C-E. Leaves ($\times 18$), F. Basal laminal cells ($\times 337$), G. Middle laminal cells ($\times 337$), H. Exothecial cells ($\times 100$), I. Apical laminal cells ($\times 337$), J. Peristome teeth ($\times 100$), K. Operculum ($\times 18$), L. Perichaetial leaf ($\times 18$).

Key to species of *Aptychella*

1. Leaves small, less than 1.5 mm, leaf margin entire or faintly toothed, nerveless
- Leaves large, 2 to 2.5 mm, leaf margin dentate at apex, 2 short, indistinct nerves

A. delicata

A. borii

Aptychella delicata (Fleisch.) Fleisch. in Musci Fl. Buitenz., **4**: 1671 (1923)

(Pl. 6)

Clastobryopsis delicata Fleisch. in *ibid.* :1180 (1923)

Clastobryum katoi Broth. In Oefv. Finsk. Vet. Soc. Foerh., **62A** : 26 (1921)

Aptychella yunnanensis Broth. in symb. Sin., **4**:117 (1929).

Plants in lax mat, delicate. Main stem creeping, branches erect, more or less regularly short pinnate, upto 8-9 cm long and c. 1-2 cm wide with leaves, smooth, yellow-green in colour. Leaves not dense, patent, but shrunk when dry, very thin, ovate-lanceolate, apex narrowly acute, apical margin distantly dentate, c. 1.01×0.22 mm, stem leaves and branch leaves similar, usually enervate. Leaf cells elongated-linear c. 40.99×3.24 μm at tip, middle cells c. 46.99×2.89 μm , basal cells little wider, c. 51×9.0 μm . Alar is distinguished by some hyaline cells, c. 26.4×4.2 μm , upper basal cells c. 16.5×7.5 μm , no papilla, cell wall thin, not porose. Perichaetial leaves long, ovate-lanceolate, long acuminate, upper portion of leaf dentate. Sporophyte not found.

Specimen examined: **Maulvi Bazar:** Srimangal, Lawacherra Forest: On sandy soil, Quazi Abdul Fattah, Jan.1963.121.

Note: The species is distinguished by its concave, ovate leaf with acute tip and the lowest row of alar cells irregularly rectangular and hyaline.

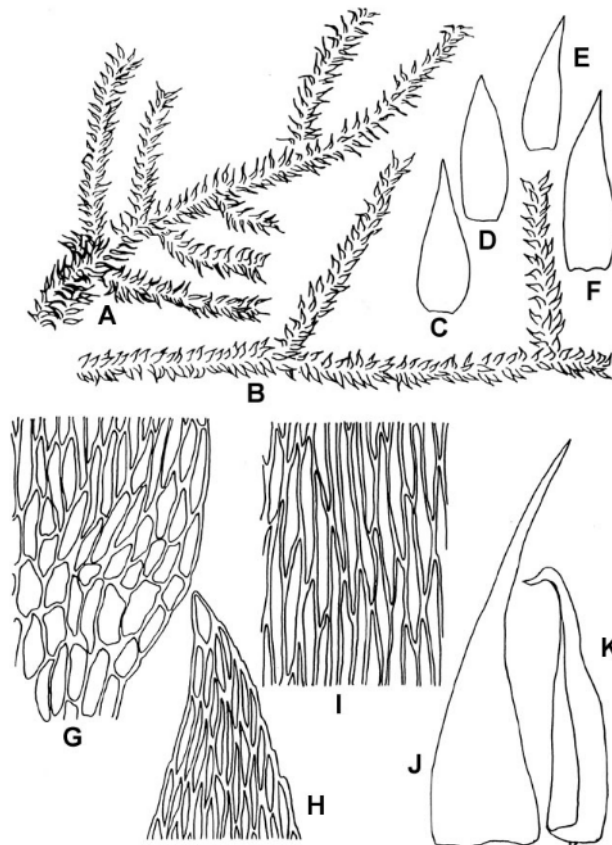


Plate 6. *Aptychella delicata* (Fleisch.) Fleisch. A. Dry plant ($\times 5$), B. Wet plant ($\times 5$), C-F. Leaves ($\times 18$), G. Basal laminal cells ($\times 225$), H. Leaf apex cells ($\times 225$), I. Middle laminal cells ($\times 225$), J, K. Perichaetial leaves ($\times 18$).

Aptychella borii Dix. in J. Bomb. Nat. Hist. Soc., 39: 790 (1937)

(Pl. 7)

Plant soft and robust, green to light golden-green. Main stem creeping with more or less pinnate branches, branches complanate. Leaves not so dense, patent, appressed to stem when dry, sometimes spreading and erect when dry, somewhat concave, ovate, tip acute, up to $1.28 \text{ mm} \times 0.38 \text{ mm}$, margin dentate at apex, margin entire except apex, nerve short, two, unequal, leaf cells elongated-linear, c. $24.6 \times 4.2 \mu\text{m}$ at apex, c. $59. \mu\text{m}$ at mid-lamina. Alar distinguished by hyaline, somewhat decurrent, lax, irregularly elongated rectangular cells, lowest and largest row across insertion, c. $21.99 \times 9 \mu\text{m}$, basal cells c. $39 \times 4.2 \mu\text{m}$, without papilla, cell wall thin, not porose. Sporophyte not found.

Specimens examined: **Maulvi Bazar:** Srimangal, Karimpur, on bark of tree, Hamida Khatun, Syeda Humayra Afroze, Md. Belal, Md. Shahabuddin, Md. Shamim, March 1992, 294.

Note: The species is distinguished by its concave, ovate leaf with acute tip and the lowest row of alar cells irregularly rectangular and hyaline.

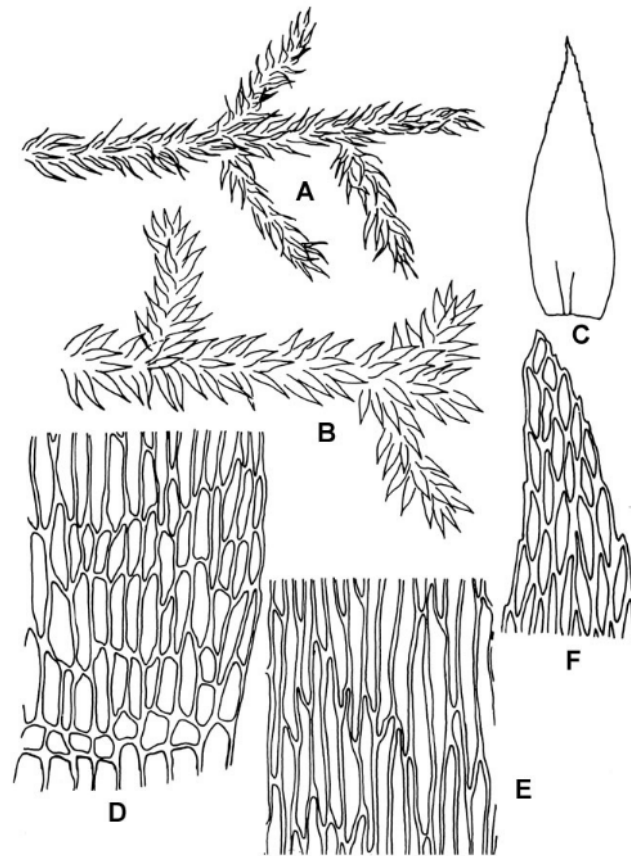


Plate 7. *Aptychella borii* Dix. A. Dry plant ($\times 5$), B. Wet plant ($\times 5$), C. Leaf ($\times 18$), D. Basal laminal cells ($\times 225$), E. Middle laminal cells ($\times 225$), F. Leaf apex cells ($\times 225$).

GENUS *ACROPORIUM* Mitt. in J. Linn. Soc. Bot., 10 : 182 (1868)

Robust, glossy, yellow mats. Branches sub-erect from creeping main stem, densely foliate, cuspidate at tips. Leaves erect, slightly homomallous, lanceolate or ovate-lanceolate, margin entire, leaf base cordate-auriculate, cells prosenchymatous, linear, smooth, basal cells usually pitted and thick-walled, alar cells large, inflated, sharply defined. Seta slender, smooth. Peristome double and perfect.

Acroporium baviense (Besch.) Broth. in Nat. pfl. ed.2, 11:437 (1925)

(Pl. 8)

Sematophyllum baviense Besch. in J. de Bot., 4:205 (1890)

Sematophyllum brevipes Broth. in Philipp. J. Sc., C8:95 (1913)

Acroporium brevipes (Broth.) Broth. in Nat. Pfl. ed. 2, 11:437 (1925) *fid.* Robins.

Plant robust, golden green to brownish, glossy, in dense tufts, rarely slender and delicate. Main stem creeping, branches erect, stems erect, irregularly branched forming dense tufts, usually not very high, densely foliate. Leaves, erectopatient, erect-squarrose, cuspidate when dry, concave, ovate-lanceolate, base slightly auriculate, c. 1.42×0.48 mm., apex acute, sharp

cuspidate, margin entire, weakly toothed towards apex, top of the leaf sometimes revolute on both sides, enervate. Leaf cells linear-rhomboid, c. $33 \times 9.9 \mu\text{m}$ at tip, walls mostly irregularly thickened and pitted, c. $70.95 \times 9.9 \mu\text{m}$ at mid-lamina, basal cells c. $29.7 \times 7.42 \mu\text{m}$, porose, tip cells sometimes papillose, gradually shorter in extreme base. Alar differentiated by conspicuous, inflated, hyaline to yellow, sometimes dark-brown, oblong, tinted with about 5 large cells, c. $79-80 \times 26.4 \mu\text{m}$. Sporophyte mainly on main stem. Perichaetial leaves narrow, erect, enervate, seta slender, erect, c. 1 cm long. Capsule horizontal, sometimes erect, ovate-cylindric, c. $1 \times 0.5 \text{ mm}$. Peristome normal, double, cilia absent, endostome shorter than exostome and striolate below.

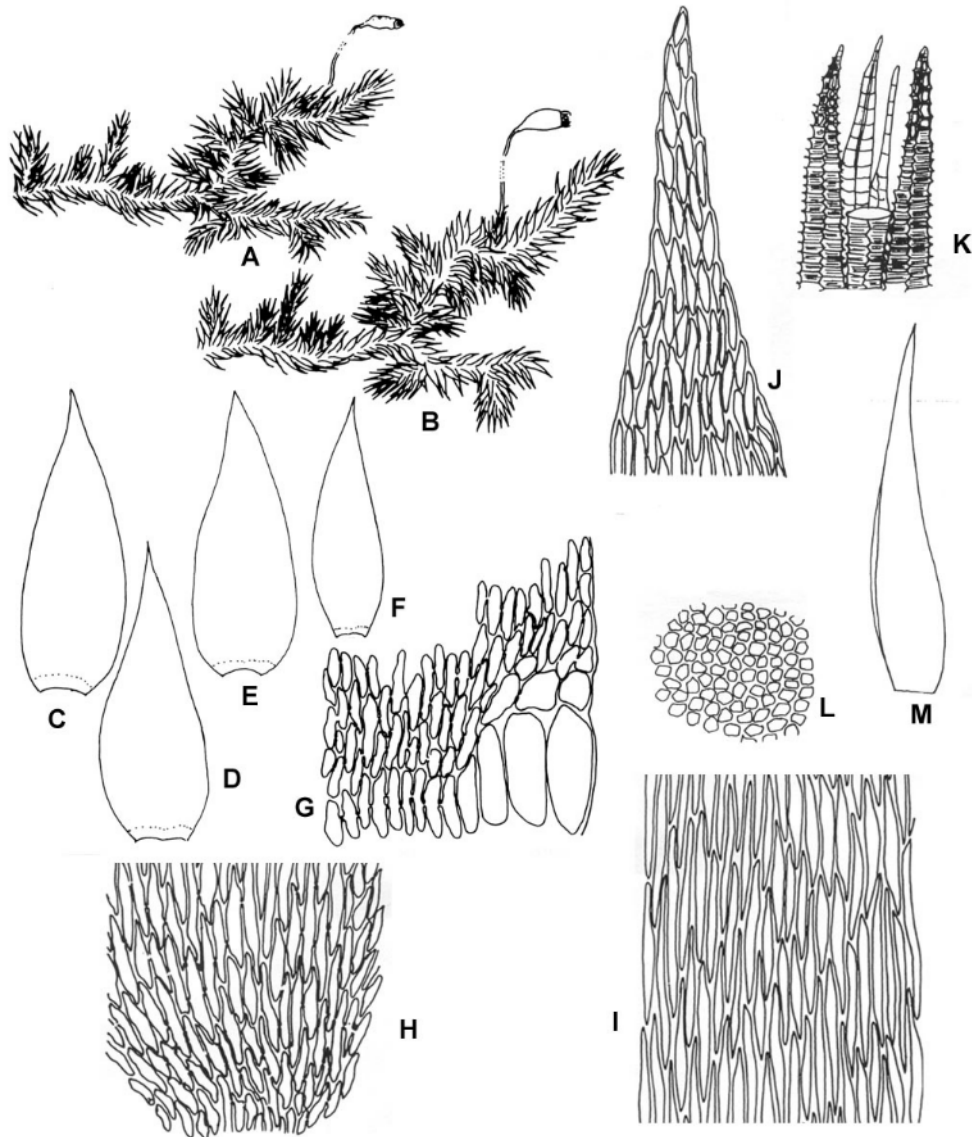


Plate 8. *Acroporium baviense* (Besch.) Broth. A. Dry plant ($\times 5$), B. Wet plant ($\times 5$), C-F. Leaves ($\times 18$), G. Basal laminal cells ($\times 150$), H. Basal middle laminal cells ($\times 150$), I. Middle laminal cells ($\times 150$), J. Leaf apex cells ($\times 150$), K. Peristome teeth ($\times 60$), L. Exothecial cells of the capsule ($\times 60$), M. Perichaetial leaf ($\times 18$).

Specimens examined: **Habiganj:** Rema Kalenga, on bark of tree, Md. Jashim Uddin, Dec.1998, **1366**; **Tangail:** Mirzapur, on bark of tree, Motaleb Hossain, Dec.1998, **1367**.

Note: The species is characterized by its irregularly branched, loosely erect golden plants, convave, ovate-lanceolate leaf with acute apex and conspicuous alar tinted with few oblong, inflated cells at angles.

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