

SPLACHNACEAE

(Brian J. O'Shea)

Plants somewhat small to medium sized, gregarious or forming loose to dense tufts, often lustrous green or reddish-brown. **Stems** erect, few to several branched by innovations, radiculose below, occasionally tomentose; central strand present. **Leaves** distant to crowded, often comose distally, rather lax, occasionally crispate when dry, ovate-lanceolate, oblong or obovate to spathulate, apex acuminate, acute or obtuse, base occasionally decurrent; margins entire or bluntly to sharply serrate or ciliate, limbate or elimbate; costa single, subpercurrent to long excurrent; laminal cells rather large, smooth, median cells rhomboidal, hexagonal or irregularly rectangular; lower and basal cells laxly oblong or rectangular; alar region undifferentiated. **Propagula** apparently absent. **Autoicous** or dioicous. **Perigonia** on lateral short branches; paraphyses clavate. **Perichaetia** terminal, leaves little differentiated. **Seta** somewhat short to more commonly elongate, rather stout, smooth to scabrous. **Capsule** erect, urn mostly short or long cylindrical; hypophysis lacking or when present inflated and elongate or obovoid, sometimes as long or longer than urn; annulus appearing absent. **Operculum** conic or convex-apiculate. **Peristome** single, teeth 16 and united in 8 pairs or initially 4 pairs at base and distally divided, erect or reflexed, mostly variously papillose. **Calyptra** mitrate and lobed at base, naked to roughened-papillose or ciliate. **Spores** spherical, smooth or variously papillose.

DISCUSSION. The Splachnaceae contain seven genera and about 60 species, widely distributed in boreal and temperate regions, and in the tropics confined to the highlands; in Africa four genera and 12 species. The Splachnaceae are the only family of mosses known to exhibit entomophily, usually involving those plants found growing on dung or carrion. The studies summarized by Koponen (1990) have shown that various species in several genera produce volatile compounds, emitting an odour from the stomata that attracts flies and assists in the dispersal of spores (not unlike that of many members of the family Araceae). Most of the studies involve taxa from the Northern Hemisphere, and it is not clear whether tropical Splachnaceae are also entomophilous, and only *Tetraplodon* of the African genera has been noted as growing on dung (but see also *Splachnum* treatment below).

LITERATURE. **Koponen, A. 1977.** *Tayloria* subgen. *Pseudotetraplodon*. subgen. nov., and new combinations in *Brachymitrium*, *Moseniella* and *Tayloria* (Splachnaceae, Musci). *Annales Botanici Fennici* 14: 193-196. **Koponen, A. 1982.** On the structure and function of the peristome in Splachnaceae. *Journal of the Hattori Botanical Laboratory* 53: 73-98. **Koponen, A. 1983.** Studies on the generic concept in the classification of the moss family Splachnaceae. Academic Dissertation, University of Helsinki. **Koponen, A. 1990.** Entomophily in the Splachnaceae. *Botanical Journal of the Linnean Society* 104: 115-127. **Koponen, A., Koponen, T., Pyysalo, H., Himberg, K. & Mansikkamäki, P. 1990.** Composition of volatile compounds in Splachnaceae. Pages 449-460. *In*: H. D. Zinsmeister & R. Mues, *Bryophytes: Their Chemistry and Chemical Taxonomy*. Oxford: Clarendon Press. **Koponen, T. & Weber, W.A. 1972.** A revision of African *Tayloria* (Splachnaceae), including *Bryomnium*. *Annales Botanici Fennici* 9: 126-134.

1. Leaf margins ciliate or distinctly bordered; peristome teeth 16, united in pairs at the apex **Brachymitrium**
1. Leaf margins not or weakly bordered or ciliate; peristome teeth in pairs of 8 or initially 4 and divided distally, erect or reflexed, or absent 2.
2. Leaf apices bluntly acute or obtuse to acuminate **Tayloria**
2. Leaf apices narrowly acuminate 3.
3. Leaf margins weakly bordered; hypophysis noticeably inflated, often greatly so; peristome of 8 pairs of fused teeth **Splachnum**
3. Leaf margins not differentiated; hypophysis slightly expanded; peristome fused initially in 4 pairs distally divided **Tetraplodon**

Brachymitrium (Fig. XX)

Four species in Africa (Gulf of Guinea islands, Cameroon, Tanzania and Madagascar), with six species in the genus.

Plants medium sized to rather large, forming loose tufts, glossy or somewhat lustrous green, yellowish-green or golden. **Stems** erect, few branched, densely tomentose; in cross-section angular (5-sided), hyalodermis present, central strand present; rhizoids reddish-brown, smooth or papillose. **Leaves** crispate or contorted when dry, erect-spreading when wet, obovate to spatulate, 4-6 mm long, apex broadly acute or obtuse and apiculate, base short to long decurrent; margins plane, bluntly serrate or ciliate, limbate or not; costa subpercurrent to ending well below apex; laminal cells smooth, median cells short hexagonal to rhomboidal; lower and basal cells long rectangular; marginal cells forming a weak border with a single row of cells or distinct golden colored border of 4-6 rows, cells fusiform to rhomboidal.

Autoicous. **Seta** elongate, 2-20 mm long, smooth, twisted or not. **Capsule** erect, urn cylindrical, 1.5-4.5 mm long, mouth somewhat flared when deoperculate, hypophysis absent; neck short; exothecial cells thick-walled; stomata at base of urn, superficial. **Operculum** short rostrate. **Peristome** single, teeth 16, united at apex, reticulate or reticulate-striate, occasionally with few perforations along median line. **Calyptra** mitrate, ciliate or scabrous.

Spores reticulate.

HABITAT. Information on the genus is limited, but it has been found on rocks and stones, epiphytic on tree trunks and on decaying logs, in montane forests, 950-2890 m. .

DISCUSSION. The genus is characterized by ciliate or distinctly bordered leaf margins, apices of peristome teeth united in pairs, and a ciliate or scabrous mitrate calyptra. Koponen & Weber (1972) provides a key for *B. jamesonii* & *B. moritzianum* (= *B. thomeanum*), with *B. immersum* described in Goffinet (1999) and *B. pocsii* in Koponen (1975). Mt. Cameroon is the prime African locality for this genus, with 3 of the 4 species.

LITERATURE. **Goffinet, B. 1999.** *Brachymitrium immersum* (Splachnaceae, Musci) a new species from Cameroon. *Bryologist* 102: 108-111. **Koponen, A. 1975.** *Tayloria pocsii*, spec. nova (Musci, Splachnaceae) from Mt. Kilimanjairo, Tanzania. *Annales Botanici Fennici* 12: 22-24 [= *Brachymitrium pocsii* (A.Kop.) A.Kop.]. **Koponen, T. & Weber, W.A. 1972.** - see family ref.

Splachnum (Fig. XX)

One species in Africa, *Splachnum adolphi-friederici* Broth. known from D.R. Congo and Uganda; a genus of nine species associated with cool, moist temperate regions.

Plants forming dense tufts, glossy pellucid green. **Stems** to ca. 1 cm tall, few branched, tomentose below; central strand present. **Leaves** small below, distally crowded and larger, ± crispate or contorted when dry, erect-spreading when wet, elliptical-lanceolate or oblanceolate, 3.0-5.5 mm long, to 2 mm wide, distally folded, apex long acuminate; margins plane, entire to sharply serrate distally; costa short excurrent; median cells large, hexagonal to hexagonal-fusiform; lower and basal cells long rectangular; alar region undifferentiated; marginal cells oblong-rectangular. **Autoicous**. **Perigonia** on short branches; leaves with an oval base and distal wide-spreading, lanceolate limb. **Perichaetia** terminal; leaves similar. **Seta** elongate, 5-40 mm long, slender, flexuose or not, pale whitish-green to pink or dark bright red, smooth, twisted when dry. **Capsule** erect, short to long exserted, differentiated between a short urn and inflated neck (hypophysis), urn cylindrical, 0.6-1.4 mm long, brown; exothecial cells strongly collenchymatous, oblate-rectangular or subquadrate; hypophysis (neck) pyriform or only slightly inflated, 1.5-6.0 mm long, to 4 mm wide, pale pink or red; stomata on distal hypophysis, superficial; columella often shortly exserted when dry.

Operculum convex- or conic-apiculate. **Peristome** teeth fused in 8 pairs, papillose, reflexed when dry. **Calyptra** mitrate-campanulate, ca. 1.2 mm long. **Spores** spherical or oval, smooth or lightly papillose.

HABITAT. On dung or soil probably previously associated with dung; mid to high open montane areas, 3000-3900 m.

DISCUSSION. The genus is readily recognized by the inflated hypophysis, combined with long-acuminate, elliptical-lanceolate or oblanceolate leaves, often weakly bordered margins, and peristome teeth fused into 8 pairs. *Splachnum adolphi-friederici* Broth. appears to have been collected only four times (Porley in Eggers et al. 2001), most recently in the Virunga mountains (Uganda), and three times in the Rwenzori mountains. Porley (op. cit.) notes that one of the BM specimens suggests a similarity to the boreal *S. ampullaceum*. The Uganda specimen was collected from a decaying log, but might have been growing on animal dung.

LITERATURE: **Eggers, J., Stevenson, C.R., Porley, R.D. & Stech, M. 2001.** New bryophyte taxon records for tropical countries IV. *Tropical Bryology* 20: 97-100.

Tayloria (Fig. XX)

Six species in Africa; about 38 species worldwide, rather widely distributed but concentrated in the highland tropics and subtemperate regions.

Plants small to medium sized, forming tufts, glossy green to reddish-brown. **Stems** erect, simple or few branched, usually tomentose below; in cross-section epidermis small, inner cells large and thin-walled, central strand present; rhizoids smooth to papillose. **Leaves** mostly crispate or contorted when dry, erect-spreading when wet, ovate-short lanceolate, elliptical to obovate or spatulate, apex broadly acuminate, acute or obtuse; margins plane to reflexed below, entire, bluntly serrate or crenulate distally, elimbate; costa 3/4 -4/5 lamina length or subpercurrent; upper and median cells large and smooth, hexagonal to rhomboidal; basal cells rectangular, rather lax. **Autoicous**. **Perichaetia** terminal, leaves similar to stem leaves. **Seta** rather short to elongate, twisted or not, smooth or scabrous. **Capsule** emergent to long exserted, erect, dark red to reddish-black, urn short cylindrical; exothelial cells oblate, thick-walled; hypophysis short (usually equal to or shorter than urn), cells elongate, thin-walled, stomata in distal half, superficial. **Operculum** not observed. **Peristome** single, teeth 8 or 16, papillose, reflexed when dry. **Calyptra** not observed. **Spores** spherical, appearing smooth to lightly papillose.

HABITAT. Usually epiphytic (including forest trees, bamboo, Ericaceae and *Dendrosenecio*), but also on soil and humus, occasionally on dung; open montane forests and afro-montane areas, 500-3700 m.

DISCUSSION. The genus is characterized by the obovate, spatulate to elliptical or broadly short lanceolate leaves, elimbate, entire to toothed margins, smooth to occasionally papillose seta, cylindrical capsule, rather narrow and short hypophysis, and papillose, 8 or 16 toothed peristome. Koponen & Weber (1972) provides a key, with additional information on *T. orthodonta* in De Sloover (1973).

LITERATURE. **Boecker, M. 2001.** Taxonomic results of the BRYOTROP expedition to Zaire and Rwanda 33. Splachnaceae, *Tayloria*. *Tropical Bryology* 20: 71-72. **De Sloover, J.L. 1973.** Note de bryologie africaine. 1. *Brachydontium*, *Atractylocarpus*, *Amphidium*, *Rhabdoweisia*, *Tayloria*, *Rhacocarpus*, *Trachypodopsis*. *Bulletin du Jardin Botanique National de Belgique* 43: 338-348. **Koponen, T. & Weber, W.A. 1972.** - see family ref.

Tetraplodon (Fig. XX)

A single species in Africa, *T. mnioides* (Hedw.) Bruch, Schimp. & W.Gümbel, known from Kenya, Tanzania, Uganda and D.R. Congo (Zaire); about five species in the genus, primarily of the Northern Hemisphere, but also in mountains throughout the tropics.

Plants medium sized, forming dense compact tufts, pale green to yellowish-green. **Stems** erect, to 3 cm or more tall, few branched, densely tomentose; central strand well developed. **Leaves** crowded, erect to erect-spreading, oblong- to obovate-lanceolate, 4.0-5.5 mm long, to 1.8 mm wide, deeply concave, apex narrowly acuminate, ending in a long hyaline subula; margins entire; costa ending in subula; laminal cells smooth, median cells oblong,

rectangular- to hexagonal-rounded; basal cells long rectangular, lax. **Autoicous**. **Perichaetia** terminal, leaves \pm larger than stem leaves. **Seta** elongate, to 30 mm long or more, stout, smooth. **Capsule** erect, urn short cylindrical, to 1.5 mm long, hypophysis narrowly elliptical, ca. 2 times longer than urn. **Operculum** conic. **Peristome** single, teeth fused into 4 pairs at base, and distally becoming 2-paired, reflexed when dry, outer surface papillose, inner surface smooth. **Calyptra** mitrate, smooth and naked. **Spores** spherical, smooth.

HABITAT. On rocks, burnt ground, fallen trees and on carnivore dung, usually containing the remains of small mammals. Subalpine ericaceous heath and alpine semi-desert, 3000-4250 m.

DISCUSSION. The genus is distinguished by the densely compact tufted plants, oblong-lanceolate to oblanceolate leaves, percurrent costa ending in a subula, and 8 peristome teeth, papillose on the outer surface, smooth on the inner.