

DALTONIACEAE

(M.J. Wigginton)

Plants small to medium sized, forming tufts or mats, green to yellowish-green or golden, sometimes glossy. **Primary stems** short and inconspicuous, or conspicuous and creeping to spreading. **Secondary stems** erect to ascending, or stems and branches spreading or sub-ascending, radiculose below; paraphyllia and pseudoparaphyllia absent; axillary hairs usually 3--4-celled; stems lacking central strand. **Leaves** spirally arranged or complanate, ovate- to oblong-lanceolate or obovate-oblong, symmetric or asymmetric, apex acuminate, acute or obtuse-apiculate; margins plane to recurved, entire to bluntly or sharply serrate or ciliate, limbate; costa single, usually 0.5--0.75 lamina length (in *Calyptrochaeta*, short and forked); laminal cells either short to \pm long hexagonal and walls thin, or cells oval to rhomboidal and walls thickened; alar region undifferentiated; border of narrow, elongate cells often present (occasionally border cells at base numerous and extend part or fully across to costa). **Gemmae** absent or present in leaf axils, short to long cylindrical. **Autoicous**, rarely dioicous. **Perichaetia** lateral, leaves differentiated, usually smaller than stem leaves. **Seta** elongate, slender to rather stout, smooth, papillose distally or throughout, or setose/ciliate distally. **Capsule** exserted, erect to inclined or pendulous, urn ovoid, neck distinct or not; exothecial cells collenchymatous; stomata present, at base of urn or on neck; annulus usually persistent, cells little differentiated. **Operculum** conic-rostrate. **Peristome** double, exostome teeth 16, papillose or striate and furrowed; endostome basal membrane low or high, segments 16, cilia reduced or absent. **Calyptra** mitrate or campanulate, smooth or sparsely hairy, base fringed. **Spores** lightly to densely papillose, rarely smooth.

DISCUSSION. This account follows Buck & Goffinet (2000) in placing 9 genera (and more than 200 species) in the Daltoniaceae, of which 4 genera and about 29 species have been described from Africa. It has a mostly pantropical distribution, with few species found in temperate regions. However, there is no general consensus as to the limits of the family, and recent molecular and other studies of the Hookeriales have variously suggested that either fewer or more genera should be assigned to the Daltoniaceae.

LITERATURE. **Buck, W.R. 1998.** Pleurocarpus mosses of the West Indies. Bronx: New York Botanical Garden. **Buck, W.R. & Goffinet, B. 2000** - (see general references).

1. Costa short, forked, 0.2 or less lamina length; seta setose/ciliate distally ... *Calyptrochaeta*
1. Costa longer, (0.4--0.5 or more lamina length; seta smooth or papillose distally or throughout 2
2. Leaves mostly lanceolate, spirally arranged, similar; apices usually gradually acuminate
..... *Daltonia*
2. Leaves broadly ovate to obovate, \pm complanate, often dimorphic; apices rounded, mucronate or apiculate 3
3. Cells in upper part of leaf \pm isodiametric, hexagonal-rounded, usually uniformly thick-walled; peristome with exostome teeth transversely striate, basal membrane high
..... *Distichophyllum*
3. Cells in upper part of leaf elongate-hexagonal, usually thin-walled; peristome with exostome teeth lacking transverse striations, basal membrane low *Distichophyllidium*

Calyptrochaeta Desv. (Fig.)

A mainly pantropical genus and southern hemisphere genus of fewer than 30 species, two of which are known from Africa: *C. asplenioides* (Brid.) Crosby recorded in South Africa, Tanzania, Madagascar, Réunion and the Comoro Islands, and *C. cristata* (Hedw.) Desv. in Mauritius.

Plants medium sized to rather large, forming turfs, light green to dark green, usually \pm glossy. **Stems** suberect, central strand present; branching sparse. **Leaves** somewhat complanate, erect-spreading, somewhat asymmetrical, broadly oblanceolate, obovate or ovate, 2.0--6.0 mm long, larger above, apex short to rather long acuminate, base slightly

decurrent on lateral leaves; margins plane, limbate, sharply to rather bluntly serrate; costa single, short and unequally bifurcate; laminal cells smooth, median cells broadly to narrowly hexagonal, c. 70--110 × 25--56 µm; marginal cells linear forming a border of 1--4(-6) rows. **Autoicous** or **dioicous**. Perichaetial leaves small, ovate-lanceolate. **Seta** 2--5 mm long, rather stout, papillose to spinose, and setose/ciliate distally with multicellular hairs (to 1 mm long). **Capsule** pendulous, urn ovoid, to ca 0.8 mm long, neck distinct. **Operculum** convex-rostrate, 0.5 mm long. **Peristome** double, yellow; exostome teeth striate below, papillose above; endostome membrane high, segments narrow, keeled and perforate, lightly papillose, cilia reduced. **Calyptra** cucullate, rough when young, fringed at base. **Spores** 12--17 µm, weakly granulose, yellow-brown.

HABITAT. On rock and humic soil in forests or other moist shaded places, including by streams and under rock overhangs; lowland to montane regions.

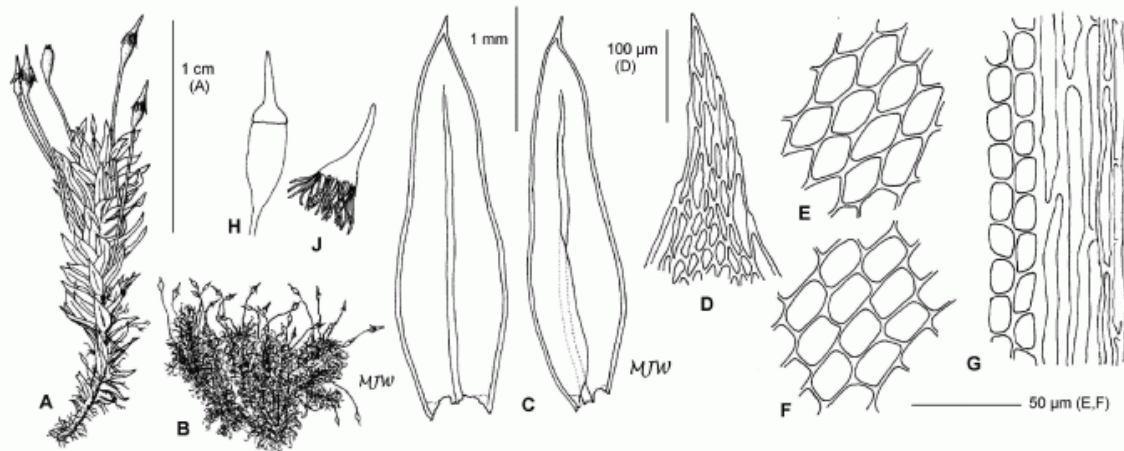
DISCUSSION. *Calyptrochaeta* is easily recognised by the complanate-foliate plants with plane, bordered leaves with a toothed margin, the short, single costa that is forked distally, and the distally spinose/ciliate seta.

LITERATURE. **Demaret, F. 1955.** Étude préliminaire des Hookeriaceae africaines intertropicales. Bulletin du Jardin Botanique de l'Etat à Bruxelles 25: 375-390. **De Sloover, J.L. 1975.** Note de bryologie africaine II. *Cyclodictyon*, *Eriopus*, *Hookeriopsis*, *Lepidopilidium*, *Lepidopilum*, *Oreoweisia*. Bulletin du Jardin Botanique National de Belgique 45: 103-124. **Magill, R.E. & Van Rooy, J. 1998.** Bryophyta. Part 1. Musci. Fascicle 3. Erpodiaceae - Hookeriaceae, In: O.A.Leistner, *Flora of Southern Africa*. Pretoria: National Botanical Institute, pp. 601-604.

Daltonia Hook. & Taylor (Fig.)

A genus of about 60 species, primarily pantropical in distribution; 16 species and 2 additional varieties have been recorded in sub-Saharan Africa.

Plants mostly rather small, usually forming small tufts, glossy pale green to dark green or golden-brown or yellowish. **Primary stems** short, creeping, inconspicuous. **Secondary stems** usually erect or suberect (sometimes spreading or even sub-pendent, ca 1.5--3.0 cm tall, branched, radiculose below. **Leaves** crowded, ± straight or slightly twisted when moist, flexuose, curled or crisped when dry, sometimes carinate (therefore with a median fold near the costa), broadly lanceolate to linear-lanceolate, mostly 2--4 mm long, apex acuminate, base rounded; margins plane or recurved on one or both sides, usually entire throughout, weakly to strongly limbate; costa single, 0.5--0.8 lamina length; laminal cells smooth, upper and median cells oval, rhomboid, oblong or fusiform, thick-walled, with distinct trigones; basal and insertion cells linear to oblong, sometimes yellowish or brownish; marginal cells linear, forming a distinct border of few to many rows. **Autoicous. Perichaetial** leaves much smaller than stem leaves, oblong- to ovate-short lanceolate. **Seta** 7--10 mm long, smooth to more commonly papillose-roughened throughout or distally. **Capsule** erect to suberect, urn ovoid; exothecial cells collenchymatous, or walls equally thickened; stomata phaneropore, on neck or urn base. **Operculum** conic-short rostrate. **Peristome** with exostome teeth narrowly lanceolate, papillose, not furrowed; endostome basal membrane low, segments linear, lightly to strongly papillose, keeled and perforate. **Calyptra** campanulate, base fimbriate. **Spores** smooth to finely papillose.



Daltonia sp. **A:** moist shoot. **B:** dry tuft, with crisped leaves. **C:** leaves. **D:** leaf apex. **E,F:** median cells from different leaves. **G:** marginal cells and reflexed margin. **H:** capsule. **J:** calyptra

HABITAT. Epiphytic, usually on twigs and small branches of trees and shrubs, and commonly on the nodes of bamboo; rarely on rocks. Most frequent in montane cloud forest but also at lower elevations; 700-3800 m.

DISCUSSION. *Daltonia* is rather easily recognised by the rather small size of the plants and usually tufted habit, the oblong-lanceolate to linear-lanceolate leaves with weakly to strongly bordered margins, the thick-walled short median leaf cells, and the distinctive fringed calyptra. Although the genus is widespread in tropical Africa, there are relatively few collections, especially from West Africa. This may be because it invariably occurs in small populations (sometimes a single tuft), and can be easily overlooked. Sometimes species can grow intermixed. A revision of African species is required, and several of the 18 taxa known from the continent have been described from only one collection.

LITERATURE. **Demaret, F. 1955.** Étude préliminaire des Hookeriaceae africaines intertropicale. Bulletin du Jardin Botanique de l'Etat à Bruxelles 25: 375-390 [key to most African species]. **Kis, G. 1996.** Taxonomic results of the BRYOTROP-Expedition to Zaire and Rwanda. 31. The Andean *Daltonia latolimbata* Broth. in Herzog in Africa. Tropical Bryology 12: 35-40.

Distichophyllidium M.Fleisch. (Fig).

A small genus with 1 species, *D. africanum* Demaret & P.de la Varde, in Africa (known from D.R. Congo, Rwanda and Tanzania), and 3--5 other species from New Guinea, Seram and New Caledonia.

Plants delicate, fragile, laxly caespitose, creeping or spreading. **Stems** flexuose, ca 5 mm long, lacking a central strand, cortical cells lax; axillary hairs present, 250--350 µm long. **Leaves** heterophyllous to weakly dimorphic, complanate, ca 0.9 × 0.3 mm, ovate to ovate-lanceolate, tapering gradually to an acuminate apex (broadly spatulate with rounded apex in other non-African species), margin entire, with conspicuous border of elongate cells; costa single, flexuose, short to long (to 0.75 leaf length in *D. africanum*). **Cells** smooth, thin-walled; upper and median cells longer than wide, ca 25--50 × 15--25 µm; basal cells elongate-hexagonal to elongate-rectangular, 30--50 × ca 10 µm, the basal marginal cells to 80 × 3--4 µm. **Seta** smooth or papillose. **Capsule** small, usually inclined, sub-pyriform, the neck swollen, epidermal cells roundish, thick-walled; stomata phaneropore; operculum rostrate. **Peristome** double, whitish-hyaline; exostome papillose, lacking striations on outer surface, median line zig-zag; endostome papillose, basal membrane low, cilia lacking. **Calyptra** mitrate, glabrous, fringed.

HABITAT. Epiphytic on trees and shrubs in montane forest or subalpine scrub, and epiphyllous in montane mossy forest; 1600-3100 m.

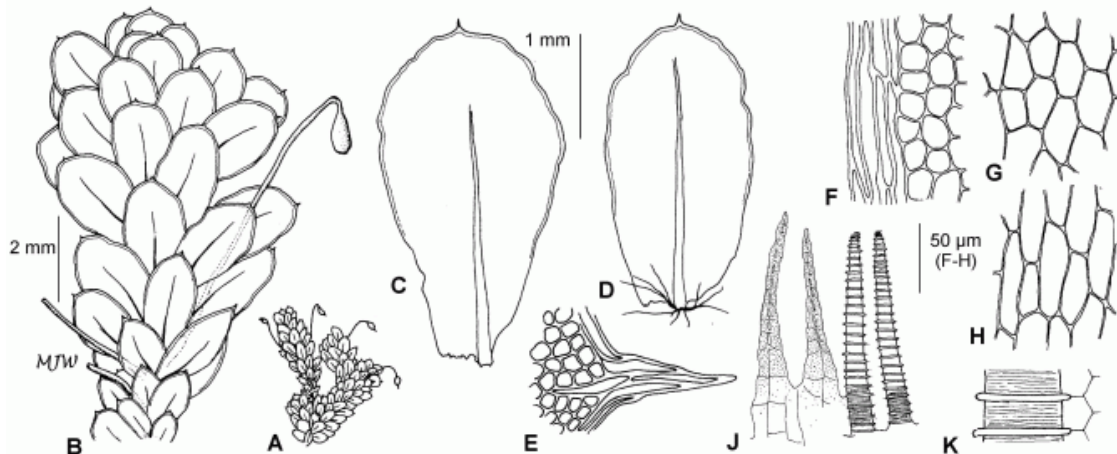
DISCUSSION. *Distichophyllidium* can resemble species of *Distichophyllum*, but the exostome teeth lack striations on the outer plates, and the endostome has a low basal membrane. The thin-walled, elongate leaf cells also seem to differentiate *Distichophyllidium africanum* from *Distichophyllum*, the upper and median cells of which are more regularly isodiametric hexagonal-rounded and usually uniformly thick-walled. Most African collections lack mature sporophytes, including the type from D.R. Congo.

LITERATURE. **Demaret, F. 1955.** Étude préliminaire des Hookeriaceae africaines intertropicale. Bulletin du Jardin Botanique de l'Etat à Bruxelles 25: 375-390. **Demaret, F. & Potier de la Varde, R. 1955.** Deux Hookeriaceae nouvelles du Ruwenzori (Congo Belge). Bulletin du Jardin Botanique de l'Etat à Bruxelles 25: 353-357.

Distichophyllum Dozy & Molk. (Fig)

A genus in which about 107 species have been described, mainly from tropical and subtropical palaeotropic regions, and absent from the neotropics. However, the genus is badly in need of a revision, and it seems likely that the number of good species will be far fewer (more than half the species have been described from only one country or island). *Distichophyllum* is poorly represented in Africa, with only 6 species recorded (and two additional subtaxa), most of them from very few locations.

Plants small to medium-sized, laxly caespitose, creeping or spreading, sparingly branched, green to yellowish-green. **Stems** flexuose, ca 5 mm long, lacking a central strand, cortical cells lax; axillary hairs present, 250--350 μm long. **Leaves** in 6 or 8 ranks, symmetrical, heterophyllous to weakly dimorphic, complanate, ovate to broadly spatulate, apex widely acute to rounded, mucronate or shortly apiculate, margin entire to weakly toothed or crenate, sometimes unevenly undulate; costa single, sometimes flexuose, thin, (0.4--0.5--0.75 leaf length. Heterophyllous plants with lateral leaves broadly spatulate, 1.8--3.8 mm long, dorsal leaves broadly oval, 1.2--1.5 mm long. **Cells** smooth, the walls usually uniformly thickened; upper cells regularly rounded-hexagonal, 25--35 μm ; becoming more elongate in lower and basal leaf, to 45--70 μm long \times 25--35 μm wide; border of linear cells sometimes present (cells 80--150 μm long \times 3--5 μm wide, in 1--3 rows). **Dioicous, autoicous** or **synoicous**. **Seta** smooth, mamillate or papillose. **Capsule** small, usually inclined, ovoid or sub-pyriform to globose, the neck swollen, epidermal cells roundish, thick-walled; stomata phaneropore; operculum conical with long beak. **Peristome** double; exostome with the outer plates transversely striate, not papillose (or papillose only towards the apex); endostome papillose or not, basal membrane high, cilia absent or rudimentary. **Calyptra** mitrate, mamillate, glabrous or papillose, the base longly ciliate.



Distichophyllum rigidicaule* var. *rigidicaule (Dusén) Broth. **A:** habit. **B:** shoot. **C,D:** leaves. **E:** leaf apex. **F:** distal leaf margin. **G:** cells near costa in distal half of leaf. **H:** basal cells of leaf. **J:** peristome teeth, showing high basal membrane of endostome. **K:** outer surface of exostome showing striations.

HABITAT. On logs, stems of tree ferns, and on rock, in primary lowland to low-montane forest, 100--1100 m.

DISCUSSION. *Distichophyllum* is closely related and similar gametophytically to the mainly neotropical *Leskeodon*, which differs in peristomial features (e.g., a papillose exostome, endostome with low basal membrane and perforate segments).

LITERATURE. **Crosby, M.R. 1976.** Trois mousses (Hookeriacées) nouvelles pour la flore Malagache. *Revue Bryologique et Lichénologique* 42: 711-714. **Demaret, F. 1955.** Étude préliminaire des Hookeriaceae africaines intertropicale. *Bulletin du Jardin Botanique de l'Etat à Bruxelles* 25: 375-390. **De Sloover, J.L. 1976.** Note de bryologie africaine VII. *Antitrichia*, *Bryohumbertia*, *Distichophyllum*, *Eucladium*, *Lindigia*, *Pseudephemerum*, *Pterogonium*, *Ptychomitrium*, *Rhachithecium*, *Streptopogon*. *Bulletin du Jardin Botanique National de Belgique*, 46: 427-447. **Magill, R.E. & Van Rooy, J. 1998.** Bryophyta. Part 1. Musci. Fascicle 3. Erpodiaceae - Hookeriaceae, In: O.A.Leistner, *Flora of Southern Africa*. Pretoria: National Botanical Institute, pp. 612-614.