

HYLOCOMIACEAE

(Brian J. O'Shea)

Plants medium sized to large and robust, forming loose to dense mats or tufts. **Stems** spreading to ascending or erect, rarely subpendent, regularly to irregularly pinnately branched; in cross-section central strand present or absent; paraphyllia and pseudoparaphyllia present or absent. **Branch leaves** in some genera sometimes smaller than the stem leaves, often narrower, more strongly toothed and with a stronger costa; in other genera similar to the stem leaves. **Stem leaves** erect to wide-spreading, falcate or not, oblong-lanceolate or broadly ovate to nearly oval, concave, plicate, smooth or rugose, apex broadly acute to rounded or gradually to abruptly acuminate, base cordate-auriculate or not; margins plane or recurved, entire to serrate or serrulate; costae double, 1/4-1/3(-1/2) lamina length or single; laminal cells smooth or prorate, median cells oblong-linear, fusiform or linear, weakly porose or not; lower and basal cells elongate, strongly porose; alar cells differentiated or not. **Dioicous**. **Perichaetia** lateral. **Seta** elongate, smooth. **Capsule** erect to inclined or horizontal, urn ovoid-cylindrical to ellipsoid, \pm curved and asymmetric. **Operculum** conic to conic-apiculate or rostrate and oblique. **Peristome** double, exostome teeth 16, smooth or cross-striate below, distally papillose, trabeculate on back; endostome lightly papillose, basal membrane high, segments 16, keeled and perforate, cilia 1-4, or absent to rudimentary. **Calyptra** cucullate, naked and smooth. **Spores** spherical, finely papillose.

DISCUSSION. The Hylocomiaceae, order Hypnales, contain 12 genera and about 25 species distributed worldwide but largely in the temperate to subarctic regions; in the tropics the family is restricted to montane habitats. In Africa there are (four or) five genera each with one species, but all species are quite rare. Following Rohrer (1985a), the family Rhytidiaceae is included within Hylocomiaceae. There are more recent proposals (e.g. Chiang & Schaal, 2000) that the genera included within the family should be reconsidered, but as yet there seems no consensus on this matter. Descriptions and illustrations of most of these taxa are found in northern temperate floras, such as Smith (1978) or Crum & Anderson (1981).

LITERATURE. **Chiang, T.-Y. & Schaal, B.A. 2000.** Molecular evolution in the *atpB-rbcL* non-coding spacer of chloroplast DNA in the moss family Hylocomiaceae. Botanical Bulletin of the Academia Sinica 41: 85-92. **Crum, H.A. & Anderson, L.E. 1981.** [descriptions, illustrations]. **Rohrer, J. R. 1985a.** A phenetic and phylogenetic analysis of the Hylocomiaceae and Rhytidiaceae. Journal of the Hattori Botanical Laboratory 59: 185-240. **Rohrer, J. R. 1985b.** A generic revision of the Hylocomiaceae. Journal of the Hattori Botanical Laboratory 59: 241-278. **Smith, A.J.E. 1978.** [descriptions, illustrations]

1. Costa single; leaves rugose when dry; some laminal cells on back of leaf with strongly projecting spine-like papillae *Rhytidium*
1. Costa double or occasionally absent; leaves smooth to weakly undulate or plicate when dry; laminal cells smooth or if papillose then papillae weak, rounded 2
2. Growth strongly sympodial, giving a stair-step habit, regularly 2-3-pinnate; paraphyllia present on stems; laminal cells prorate (with projecting cell ends) *Hylocomium*
2. Growth form monopodial to irregular, not or 1-2-pinnate; paraphyllia present or not; laminal cells smooth 3
3. Stem leaves broadly clasping at base; paraphyllia present on stem; alar cells not differentiated *Loeskeobryum*
3. Stem leaves not clasping stem; paraphyllia absent from stem; alar cells differentiated 4
4. Leaf margins serrulate to serrate above base; alar cells lax, thin-walled, hyaline
..... *Leptohyemium*
4. Leaf margins entire or faintly serrulate at apex; alar cells firm, thick-walled reddish-brown
..... *Pleurozium*

Hylocomium Bruch, Schimp. & W. Gümbel (Fig. XX)

A monotypic genus (*H. splendens* (Hedw.) Bruch, Schimp. & W. Gümbel), mainly of the temperate regions but also in tropical America and Africa. It occurs occasionally in the mountains of North, Central and East Africa and also (probably introduced) on St. Helena.

Plants medium sized to robust, in loose wefts, usually yellow- to olive-green. **Stems** bright red, prostrate, usually with ascending, arching innovations, giving a layered, 'stair step' appearance (caused by its sympodial growth pattern), regularly 1-3-pinnate, often frondose; in cross-section with no central strand; paraphyllia numerous on the stems and primary branches, fewer on the branchlets, branching from a multi-seriate base into several long strands, uniseriate towards the tips. **Stem leaves** ovate-oblong, slightly concave, abruptly narrowed to obtuse to acute, channeled acumen, a little plicate below, slightly decurrent, margin sometimes recurved near base, otherwise plane, denticulate or dentate; nerve double, sometimes weak but usually to at least half leaf length; basal cells narrow, rhomboidal, thick-walled, porose, orange brown, alar cells not differentiated, medial cells linear, 7-14 times longer than wide, smooth to finely papillose because of projecting cell ends, to 80 µm. **Branch leaves** smaller than stem leaves, erect to spreading rather than imbricate, with the leaves at the branch tips much smaller, ovate-lanceolate, acute. **Dioicous. Perichaetia** restricted to stems. **Seta** elongate, red-brown, smooth. **Capsule** inclined to pendent, bent above the neck, asymmetric ovoid to ellipsoid with distinct neck, gibbous, occasionally wrinkled when dry, exothecial cells mostly isodiametric, with unevenly thickened walls. **Operculum** strongly oblique, long-rostrate from a conic base. **Peristome** double, exostome teeth yellow-brown, reticulate becoming papillose above, endostome teeth yellow, smooth, keeled, usually split into one large perforation, cilia 2-4, nodulose. **Calyptra** cucullate, smooth, naked. **Spores** 10-18 µm, very finely papillose.

HABITAT. On soil, in turf on banks or on soil-covered rocks, calcifuge, in subalpine to alpine areas, 2600--4100 m.

DISCUSSION. Characterised by dull to glossy yellowish-green to -brown patches in coarse wefts normally exhibiting a layered habit with frondose branching, dense 'deer-horn' paraphyllia on the stems and prostrate leaf cells. Although it seldom produces sporophytes, the capsules with a distinct neck and reticulate exostome, gaping splits in the endostome and an obliquely long-rostrate lid are also distinctive. It is known, sometimes in some quantity, from Mts. Kilimanjaro and Meru, and also from Mt. Kenya, Mt. Elgon, and the Rwenzori-Virunga range.

LITERATURE. See family refs.

Leptohymenium Schwägr.(Fig. XX)

A single species has been reported for Africa, *L. stramineum* (Muell.Hal.) A.Jaeger, from Ethiopia, otherwise only known from Himalayas. There is some doubt about this record - see discussion below. A genus with three species.

Plants medium sized, forming coarse mats, glossy yellowish- to golden-green or golden-brown. **Stems** spreading with ascending and arching stems, 1-2 pinnately branched; paraphyllia absent; pseudoparaphyllia ovate to deltoid. **Stem leaves** loosely erect-spreading to squarrose, broadly ovate, to 1.5 mm long, concave, smooth to irregularly and weakly plicate, apex acute to short acuminate or obtuse, base short decurrent; margins plane, reflexed at base, serrulate to serrate distally, serrulate or entire at base; costae double, very short to 1/2 lamina length, separated at base, slightly diverging; median cells oblong-linear, smooth to weakly papillose by projecting distal cell angles; basal cells larger, porose; alar region differentiated, cells enlarged, oval to oblong, lax and thin-walled. **Branch leaves** erect to spreading, ovate to elliptic, to 1.1 mm long, slightly decurrent; alar cells less differentiated. **Dioicous. Perichaetia** lateral. **Seta** to 23 mm long, smooth. **Capsule** erect, urn cylindrical to ovoid-cylindrical, to 3.5 mm long, smooth or weakly wrinkled. **Operculum** long conic to obliquely

rostrate. **Peristome** double, inserted below mouth, exostome teeth \pm smooth; endostome smooth, basal membrane high, segments short, keeled and perforate, cilia absent or rudimentary. **Calyptra** unknown. **Spores** finely papillose.

HABITAT. African habitat not known, but elsewhere epiphytic on branches and trunks of trees, also on moist rocks and soil; montane forests (*Quercus* and *Pinus*), 1400-2750 m.

DISCUSSION. This species was first reported for Ethiopia in Paris' *Index Bryologicus* in 1895, and all subsequent references are based on this. There is no further information, and the taxon is otherwise known only from the Himalayas. As the *Index* contains a large amount of information based on provisional and unverified identifications, it is possible that this report was mistaken, and that the genus does not occur in Africa. The description here is therefore not based on African material.

A genus characterized by ascending and arching stems that are 1-2 pinnately branched, squarrose to erect spreading, broadly ovate stem leaves, serrulate to serrate throughout along margin, double costae, thin-walled and lax, enlarged alar cells, erect cylindrical capsules, smooth exostomial teeth, and short endostomial segments set on a high basal membrane. *Leptohymenium* may be confused with members of the Hypnaceae, but the fundamental differences in the peristome separate the two. Further distinctions of help are the combination of broadly, somewhat wrinkled ovate leaves, elongate double costa, and oblong-linear cells that are often weakly projecting at distal cell angles.

LITERATURE. See family refs.

Loeskeobryum M.Fleisch. ex Broth. (Fig. XX)

One species in Africa, *L. brevirostre* (Brid.) M.Fleisch. ex Broth., which has only been recorded once from Réunion, although quite widespread in the Northern Hemisphere. A genus segregated from the more traditional *Hylocomium*, containing three species primarily confined to the Northern Hemisphere.

Plants large and robust; forming loose mats, glossy green. **Stems** loosely spreading to subpendent, to 22 cm long, reddish, irregularly pinnately branched; in cross-section central strand absent; paraphyllia numerous, filiform, few to many branched, smooth. **Stem leaves** wide-spreading to squarrose, oval to broadly ovate, nearly as wide as long, 3.0--3.8 mm long, to 3 mm wide, \pm plicate, apex abruptly narrowly acuminate, base cordate-auriculate, clasping stem; margins plane, coarsely serrate distally, often sharply so, serrulate below; costae double, ca. 1/3 lamina length; median laminal cells oblong-linear, somewhat vermicular, weakly porose; basal and insertion cells oblong-rectangular, strongly porose, golden-yellow or -brown. **Branch leaves** erect-spreading, ovate, 2.3--2.6 mm long, 1.2--1.5 mm wide, concave, apex short acuminate. **Dioicous**. **Perichaetia** lateral. **Seta** elongate, smooth. **Capsule** inclined, ovoid-short cylindrical. **Operculum** conic-rostrate. **Peristome** double, exostome teeth cross-striate below, distally papillose, trabeculate; endostome papillose, basal membrane high, segments keeled and perforate, cilia 2--3. **Calyptra** cucullate, smooth and naked. **Spores** finely papillose.

HABITAT. The only collection known from Africa (made by Commerson) was published by Bridel in 1827, and the description contained no mention of habitat, but normally this plant is found on soil, logs or rocks, somewhat pendent from shrubs and over humus; in the tropics it would be expected in mid to high montane forest and scrub.

DISCUSSION. The description given here is not from African material (see note on habitat), but the distinguishing features include the large stature of the plants, abundant branching, filiform paraphyllia, leaves clasping stem, abruptly narrow acuminate apex from a broadly ovate leaf base, sharply and coarsely serrate margins, and strong double costae. Sporophytes are unknown in the tropics.

LITERATURE. **Bridel, S.E. 1827.** *Bryologia Universa*. Leipzig: J.A. Barth.

Pleurozium Mitt. (Fig. XX)

A monotypic genus; *P. schreberi* (Brid.) Mitt. is known only from two recent collections in the Ethiopian mountains, and is primarily distributed in the Northern Hemisphere.

Plants medium to somewhat large, forming mats or tufts, rather glossy green to yellowish-brown or golden; paraphyllia none. **Stems** spreading to more commonly ascending, to 10 cm or more long, julaceous, dark red, regularly to irregularly pinnately branched; in cross-section outer cell rows small and thick-walled, inner cells larger, thin-walled, central strand present. **Stem leaves** suboval to ovate or oblong-ovate, 2-3 mm long, to 1.7 mm wide, deeply concave, apex broadly acute to rounded, reflexed at base; margins plane, entire; costae short and double, ca. 1/4-1/3 lamina length; median cells fusiform to linear, porose; alar cells inflated, and somewhat excavate, thick-walled, short to long oblong or quadrate, golden-yellow or reddish-brown. **Branch leaves** smaller, ovate, enrolled distally, apex acute; margin entire to weakly serrulate distally. **Dioicous**. **Seta** often twisted. **Capsule** inclined, urn ellipsoid and curved, exothecial cells subquadrate to oblong, \pm thick-walled, stomata present at base of urn, superficial; annulus absent. **Operculum** conic. **Peristome** with exostome teeth faintly reticulate; endostome cilia 2-3.

HABITAT. On humus and soil, in somewhat dry sites, also associated with semi-dry margins of bogs or marshes; mostly high open montane. In Africa, in *Philippia* / *Hagenia* / *Juniperus* scrub forest at 3300--3500 m in the Bale mountains of southern Ethiopia.

DISCUSSION. The ascending habit, dark red stems, strong, short and forked leaf costa, and the porose, thick-walled, usually dark reddish-brown alar cells aid in distinguishing *Pleurozium*.

LITERATURE. (see family ref.).

Rhytidium (Sull.) Kindb. (Fig. XX)

A monotypic genus, *R. rugosum* (Hedw.) Kindb. is widespread in the Northern Hemisphere. In Africa it is known only from Mt. Elgon and Mt. Kenya.

Plants rather robust, forming loose tufts, somewhat glossy yellowish- to golden-brown. **Stems** stiffly erect-ascending, to 5 cm or more tall, regularly to irregularly pinnately branched, branches short, often oriented towards one side, tips curved or hooked; paraphyllia none. **Leaves** crowded, falcate, loosely erect when dry, erect-spreading when wet, oblong-lanceolate or elliptic-short lanceolate, to 4 mm long, both plicate and rugose, apex secund, gradually acuminate; margins revolute below apex, distally serrate; costa single, 2/3-3/4 lamina length; laminal cells oblong-linear, flexuose, smooth with some cells papillose at distal angles on back, porose, thick-walled; alar cells subquadrate to short rectangular and oblate, thick-walled, smooth. **Perichaetial** leaves lanceolate with spreading long acuminate apices. **Seta** to 25 mm long. **Capsule** horizontal, urn obloid-cylindrical, asymmetric, smooth, neck short; annulus in 2-3 rows. **Operculum** conic-apiculate or -short rostrate and oblique. **Peristome** with exostome teeth cross-striate below, papillose distally; endostome cilia 1-2, nodose.

HABITAT. Exposed sites on rock or thin soil over rock, often associated with escarpments and calcareous habitats; open montane to scrub, 4000--4200 m.

DISCUSSION. This is a large, distinctive moss with a robust, ascending habit, falcate, rugose leaves, single costa, smooth median cells with some cells strongly papillose at upper cell angles, and thick-walled, subquadrate alar cells. *Rhytidium* is placed in the Rhytidiaceae by some authors.

LITERATURE. (see family ref.).