

HEDWIGIACEAE

(Brian J. O'Shea)

Plants medium sized, forming tufts or cushions, glaucous to dark green, brown to yellowish. **Stems** spreading to ascending or erect, several branched, weakly radiculose at base; central strand absent or weak; pseudoparaphyllia filamentous. **Leaves** imbricate, spirally arranged, appressed to erect when dry, spreading to wide-spreading or squarrose when wet, ovate, obovate, narrowly to broadly lanceolate or oblong-short lanceolate, apex acute to acuminate, hyaline or not; margins plane to recurved below or throughout, entire or dentate at apex, elimbate; costa none; laminal cells quadrate to short rectangular, papillose, walls sinuose; insertion cells elongate and sinuose, papillae in rows, often golden-brown.

Autoicous, rarely synoicous or polyoicous. **Perichaetia** terminal but appearing lateral, leaves elongate, broadly to rather narrowly lanceolate, margins ciliate or not. **Seta** short or elongate, smooth. **Capsule** immersed or exserted, erect, short cylindrical to ellipsoid or subglobose, often striate or ribbed when dry. **Operculum** plano-mammillate to short rostrate. **Peristome** absent. **Calyptra** cucullate or short and mitrate. **Spores** spherical, papillose, rarely multicellular.

DISCUSSION. The Hedwigiaceae contain four genera and about 20 species; in sub-Saharan Africa, three genera and ten species. The family is recognized by the ecostate leaves, papillose laminal cells that are sinuose, and capsules that lack a peristome. The family is placed in the order Orthotrichales, previously with the Grimmiales and more recently with the Leucodontales. *Hedwigidium* is synonymized under *Hedwigia* by some authors. *Rhacocarpus*, until recent times, has been placed in the Hedwigiaceae; at present it is placed in its own family, the Rhacocarpaceae; see discussion and review by De Luna (1990b).

LITERATURE. **De Luna, E. 1990a.** Developmental evidence of acrocarpy in *Hedwigia ciliata* (Musci: Hedwigiaceae). *Tropical Bryology* 2: 53-60. **De Luna, E. 1990b.** Protonemal development in the Hedwigiaceae (Musci), and its systematic significance. *Systematic Botany* 15: 192-204. **De Luna, E. 1992.** *Developmental and systematic studies in the Hedwigiaceae (Musci)*. Ph.D. thesis. Ann Arbor: University Microfilms International. **De Luna, E. 1995.** The circumscription and phylogenetic relationships of the Hedwigiaceae. *Systematic Botany* 20: 347-373.

1. Leaf apex hyaline, to 1/4 of apex; margins plane or indistinctly recurved; margins of perichaetial leaf ciliate *Hedwigia*
1. Leaf apex concolorous or weakly hyaline at tips; margins recurved; margins of perichaetial leaf not ciliate 2
2. Seta elongate, to 5-18 mm long; capsule exserted; leaves often distinctly plicate; plants saxicolous or epiphytic *Braunia*
2. Seta short, 0.8-1.2 mm long, capsule immersed; leaves indistinctly plicate or not at all; plants saxicolous *Hedwigidium*

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

Eight species and one variety are recorded for Africa, although this number may be reduced to six (De Luna 1992) following revision; a genus containing 16 species.

Plants medium sized, forming loose to dense coarse mats or tufts, dull yellowish-brown to golden. **Stems** creeping, leaves mostly reduced, scale-like, appressed with tips spreading to recurved, frequently eroded from stem, distal stems and branches mostly ascending, several branched; pseudoparaphyllia foliose. **Leaves** imbricate, appressed with apices reflexed when dry, erect-spreading to spreading or squarrose when wet, ovate, obovate to oblong-ovate or lanceolate, 1.5--2.0 mm long, flat to concave, weakly to strongly plicate, apex short acuminate to abruptly long acuminate; margins entire below, apices irregularly dentate, erect to recurved throughout or partially, rarely plane; laminal cells thick-walled, upper and median cells short

to long and narrowly rectangular, \pm sinuose, papillose; lower middle and basal cells long rectangular, sinuose, papillose, papillae in single row; alar region differentiated, subquadrate to short-rectangular and oblate, walls rounded. **Synoicous**. **Perichaetia** appearing lateral, leaves elongate, narrowly-oblong-lanceolate. **Seta** elongate, (3-)5--18 mm long, smooth, often twisted. **Capsule** exerted or emergent, erect to suberect, urn ovoid, cylindrical or ellipsoid to subglobose, 1.3--2.2 mm long, wrinkled or furrowed when dry, mouth slightly constricted. **Operculum** long rostrate, oblique. **Peristome** absent. **Calyptra** cucullate, smooth and naked. **Spores** spherical or multicellular, papillose.

HABITAT. Epiphytic on tree trunks or branches, and on rocks; open to forested montane to alpine, (500--1350--3500 m).

DISCUSSION. *Braunia* is readily distinguished from the two remaining genera of the family by the elongate seta and well exerted capsule. In the absence of sporophytes, however, the genera are difficult to distinguish, particularly *Braunia* and *Hedwigidium*. *Braunia* is found on rocks as well as shrubs and trees, whereas *Hedwigia* and *Hedwigidium* are almost always restricted to rocks. De Luna's thesis (1992) has not resulted in any taxonomic publications regarding African *Braunia*, although many herbarium specimens show his annotations. The most commonly reported species in Africa (*B. secunda*) is said by De Luna (1992) to be exclusively American, so much African material will need to be re-identified.

LITERATURE. De Luna, E. 1992. - see family ref.

Hedwigia P.Beauv. (Fig. XX)

A single species in the area, *H. ciliata* (Hedw.) Ehrh. ex P.Beauv., with varieties *ciliata* (Cape Verde Islands, DR Congo (Zaire), East and Southern Africa and Madagascar) and *leucophaea* Bruch Schimp. & W.Gümbel (East Africa); the genus contains three or four species.

Plants medium sized, forming loose to dense tufts or cushions, grayish-green. **Stems** spreading to suberect; pseudoparaphyllia filamentous. **Leaves** appressed to erect when dry with distal apices spreading or recurved, spreading to erect-spreading when wet, ovate-lanceolate, 2.0--2.3 mm long, apex acuminate, upper 1/4 of apices hyaline and distinctly papillose; margins plane or slightly recurved below; costa absent; apical cells elongate, hyaline and indistinct, papillae in single row, to 8 or more; median cells short rectangular or quadrate, appearing sinuose, papillose, papillae 1-3, simple or branched; upper basal center cells long rectangular, papillae 3-6; lower basal center and insertion cells smooth, porose, often golden-brown. **Perigonia** bud-like, appearing lateral. **Perichaetia** on short terminal branches, appearing lateral, leaves narrowly lanceolate, distal margins long ciliate, cilia long and short branched, hyaline. **Seta** very short, 0.25--0.50 mm long, smooth. **Capsule** immersed, erect, urn short cylindrical, subglobose when deoperculate, 1.0--1.2 mm long, smooth. **Operculum** plano-mammillate. **Peristome** absent. **Calyptra** small, mitrate, smooth and hairy. **Spores** with trilete lines, coarsely rugose-papillose.

HABITAT. On rocks, very occasionally reported from tree bases; open montane to alpine areas, (500--1800--3700 m).

DISCUSSION. The hyaline leaf tips, ciliate margins of the perichaetial leaves, and immersed, and rather smooth capsules, in combination with the shared family features, distinguishes *Hedwigia*.

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

A monotypic genus represented by *H. integrifolium* (P.Beauv.) Dixon in C.E.O.Jensen, found in our area in Cameroon, East and Southern Africa and Réunion. (also Western Europe, pantropical at high elevations, Australia and New Zealand).

Plants medium sized, forming tufts or mats, green to dark reddish-brown. **Stems** erect or spreading; central strand absent; pseudoparaphyllia foliose. **Leaves** appressed, spreading to wide-spreading when wet, ovate to oblong-ovate, 1.5--2.2 mm long, weakly plicate or not,

apex acute or short acuminate; margins strongly recurved, entire below, distally dentate or crenulate, occasionally weakly toothed; costa absent; apical cells elongate, median cells short rectangular to subquadrate, sinuose, papillose, papillae several along margin, appearing over lumen; central upper basal cells rectangular, porose, papillae few to several (7 or more) in single row (rarely double row); insertion cells at center smooth, golden-brown or yellow; cells of alar region quadrate, smooth. **Perichaetia** appearing lateral, but on terminal branches, leaves broadly lanceolate to oblong-lanceolate, to 5 mm long, plicate, short acuminate, upper margins not ciliate. **Seta** short, 0.8--1.2 mm long. **Capsule** immersed, erect, short obloid, 1--2 mm long, furrowed when dry or wet. **Operculum** short rostrate, oblique. **Peristome** absent. **Calyptra** small mitrate, smooth and naked. **Spores** with trilete lines, rugose-papillose.

HABITAT. On rocks; open montane to alpine, 1600--3900 m.

DISCUSSION. The genus is characterized by the concolorous leaves, elongate, eciliate perichaetial leaves, furrowed, and immersed capsules. Without sporophytes, *H. integrifolium* is difficult to distinguish from *Braunia* growing on rock, so always look carefully for sporophytes (which are quite often present).