

RHABDOWEISIACEAE

(Jan-Peter Frahm)

Plants very small to medium sized, forming short tufts. **Stems** short, simple or few branched by innovations, with a central strand. **Leaves** mostly progressively larger distally, lanceolate to narrowly lanceolate or subulate from an oblong or oblong-ovate base; margins plane or recurved, entire or distal tips serrulate; costa single, subpercurrent to short excurrent; laminal cells smooth. **Asexual structures** absent. **Autoicous**. **Sporophytes** terminal; perichaetial leaves often larger and longer than stem leaves. **Seta** short to elongate, erect or curved to flexuose, smooth. **Capsule** immersed to exerted, urn obloid to pyriform with a neck distinctly elongate, occasionally as long as or much longer than the urn; stomata numerous in neck region, superficial; annulus often well developed. **Operculum** absent or present and rostrate. **Peristome** absent or single with 16 teeth. **Calyptra** cucullate or mitrate. **Spores** variously ornamented.

DISCUSSION. The Rhabdoweisiaceae, although introduced by Limpricht in 1890, were usually included as a subfamily in the Dicranaceae. Recent molecular-systematic studies (Stech 1999) support the maintenance of Limpricht's concept. Limpricht included *Cynodontium*, *Dichodontium*, *Oreas*, *Oreoweisia*, *Rhabdoweisia* and *Amphidium* in this family, of which all genera except for *Dichodontium* and *Oreas* occur in tropical Africa..

LITERATURE. **Stech, M. 1999.** A reclassification of Dicranaceae (Bryopsida) based on non-coding cpDNA sequence data. Journal of the Hattori Botanical Laboratory 86: 137-160.

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| 1. Upper laminal cells smooth or mamilllose; capsules with peristome | 2 |
| 1. Upper laminal cells papillose; capsule without peristome | <i>Amphidium</i> |
| 2. Upper laminal cells smooth | <i>Rhabdoweisia</i> |
| 2. Upper laminal cells mamilllose | 3 |
| 3. Leaves oblong-linear, apex obtuse | <i>Oreoweisia</i> |
| 3. Leaves linear-lanceolate; apex acuminate | <i>Cynodontium</i> |

Amphidium Schimp. (Fig. XX)

A genus of 11 species worldwide, of which 4 occur in the mountains of tropical Africa. Three species are known only from a small range, of which *A. aloysii-sabaudiae* G.Negri and *A. le-testui* Thér. are African endemics with very few collections and *A. lapponicum* (Hedw.) Schimp. is a mainly holarctic species which occurs also in southern Africa. Only *A. tortuosum* (Hornsch.) H.Rob. is more widespread.

Plants in small to tall, often large tufts, yellowish to olive green, rusty brown below. **Stems** erect, simple or rarely branched, moderately radiculose. **Leaves** crispate when dry, erect-spreading when wet, narrow-lanceolate, apex acute, concave; margins plane, smooth; costa percurrent; upper laminal cells irregularly subquadrate, polygonal or rounded, densely papillose on both surfaces, moderately incrassate, chlorophyllose, basal laminal cells lax, thin-walled, hyaline, elongate rectangular; alar cells not differentiated. **Autoicous**. **Perichaetia** terminal, perichaetial leaves longer, sheathing. **Seta** short, a few mm long, straight, twisted when dry. **Capsule** usually immersed in the perichaetial leaves or only shortly exerted, erect, pear shaped, with 8 distinct, darker coloured longitudinal ribs, widened at mouth when emptied. **Operculum** from flat convex base obliquely rostrate. **Calyptra** cucullate, smooth, entire at base. **Peristome** lacking. **Spores** verrucose, 20-25 µm.

HABITAT. On rocks and in fissures of rocks in high montane to alpine regions, 2400 – 4800 m.

DISCUSSION. Until recently, the systematic position of this genus was controversial, as the genus lacks peristome teeth and it could not be decided whether it was a haplolepidous or diplolepidous genus. According to gametophytic characters, it was either included in the

Orthotrichaceae or Dicranaceae. Recent molecular systematic studies (Goffinet & Vitt, 1998; Stech, 1999) revealed that *Amphidium* is not a diplolepidous moss and does not fit into the Orthotrichaceae. It is now placed into the Rhabdoweisiaceae because of morphological and anatomical similarities with the other genera of this family. The two southern African species are well illustrated by Van Rooy (1991).

LITERATURE. **Goffinet, B. & Vitt, D.H. 1998.** Revised generic classification of the Orthotrichaceae based on molecular phylogeny and comparative morphology. In Bates, J.W., Ashton, N.W. & Duckett, J.G. (eds.) *Bryology for the twenty-first century*: 143-159. Leeds: Maney Publishing and the British Bryological Society. **Stech, M. 1999.** A molecular systematic contribution to the position of *Amphidium* Schimp. (Rhabdoweisiaceae, Bryopsida). *Nova Hedwigia* 68: 291-300. **Van Rooy, J. 1991.** The genus *Amphidium* Schimp. in southern Africa. *Lindbergia* 17: 59-63.

Cynodontium Schimp. (Fig. XX)

A genus of about 10 species primarily distributed in the Northern Hemisphere. Only *C. tanganyikae* P.de la Varde has been recorded from tropical Africa.

Plants in small tufts, green to yellowish green. **Stems** to 3 cm tall, simple or rarely branched, whitish radiculose below. **Leaves** crispate when dry, erect-spreading when wet, linear-lanceolate, 4--5 mm long, apex acute, concave; margins partially recurved in the lower part of the leaf, weakly dentate in the upper part; costa subpercurrent, 1/4--1/5 width of leaf base; upper laminal cells irregularly subquadrate, mamilllose, basal laminal cells lax, translucent, shortly rectangular, narrower at margins; alar cells not differentiated. **Autoicous.** **Perichaetia** terminal, perichaetial leaves ecostate, truncate, smooth. **Seta** 3--7 mm long, straight to curved or cygneous (when wet), smooth. **Capsule** erect to suberect, urn obovoid-cylindrical, 2.4 mm long, strongly furrowed when dry; annulus absent. **Operculum** conic-long rostrate, erect or oblique. **Calyptra** cucullate, smooth, entire at base. **Peristome** teeth golden, to 1/2--2/3 divided, vertically striate. **Spores** verrucose, 20--25 μm .

HABITAT. Below a *Philippia*-shrub, only known from the type locality at Kilimanjaro Mtn., 4000 m.

DISCUSSION. Potier de la Varde (1955) compares the only African species with *C. fallax*, from which it can be distinguished by a longer seta, ecostate perichaetial leaves and deeply furrowed capsule.

LITERATURE. **Potier de la Varde, R. 1955.** Mousses récoltées par M. le Dr. Olov Hedberg en Afrique centrale, au course de la mission suédoise de 1948. *Arkiv för Botanik* 2,3: 124-204.

Oreoweisia (Bruch, Schimp. & W.Gümbel) De Not. (Fig. XX)

A genus of 15 species worldwide, which are characteristic for tropical mountains, especially the Andes. Only *O. erosa* (Müll.Hal.) Kindb. occurs in Central and Southern Africa, which is also widespread in the Andes from Mexico to Bolivia (Griffin, 1989).

Plants in loose tufts, green to yellow green. **Stems** erect, to 1 cm tall, radiculose below; in cross-section with central strand. **Leaves** crispate when dry, loosely erect-patent when moist, ligulate, ca. 1.5--2 mm long, apex obtuse, rarely acute to rounded acute; margins recurved, erose-serrate in the upper part; costa strong, ending just below apex, ca. 1/5 width of leaf base, prominent on back; upper laminal cells short irregular, highly mamilllose on both sides, basal laminal cells short rectangular, smooth, hyaline; alar cells lacking. **Autoicous.** **Perichaetia** appearing lateral, **Perigonia** terminal, leaves with clasping base. **Seta** 5-6 mm long, erect. **Capsule** erect, urn short cylindrical, 1.5 mm long; annulus persistent. **Operculum** conical, erect or somewhat oblique. **Peristome** teeth irregularly perforated, smooth. **Calyptra** cucullate, smooth, base mostly entire. **Spores** coarsely papillose, 20--22 μm .

HABITAT. Terricolous.

DISCUSSION. The genus resembles *Rhabdoweisia* with which it is placed in the same subfamily. The latter differs, however, by the 8-ribbed capsule and absence of a stem central strand.

LITERATURE. **De Sloover, J.L. 1975.** Note de bryologie africaine. II. *Oreoweisia*, *Eriopus*, *Cyclodictyon*, *Hookeriopsis*, *Lepidopilidium*, *Lepidopilum*. Bulletin du Jardin Botanique National de Belgique 45: 103-124. [description, illustration]. **Griffin, D. 1989.** *Oreoweisia erosa* (C. Muell.) Kindb., an African-neotropical disjunct. Cryptogamie. Bryologie, Lichénologie 10: 297-300. [description]. **Magill, R.E. 1981.** - see general ref. [description, illustration].

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

Nine species worldwide, mainly in the northern hemisphere. Four species occur in Africa south of the Sahara, of which *R. crispata* (Dicks.) Lindb. and *R. fugax* Bruch, Schimp. & W.Gümbel are mainly holarctic species with disjunct occurrence in Southern Africa; *R. africana* Dixon & Naveau and *R. lineata* P.W.Richards & Argent are endemics in tropical Africa. All taxa except *R. crispata* are discussed briefly and partly illustrated by De Sloover (1973).

Plants small, in short dense or loose short tufts, green. **Stems** erect, to ca. 10 mm, little branched; central strand absent. **Leaves** crispate when dry, erect patent when moist, linear-lanceolate to oblong-lanceolate, 2--3 mm long, apex acuminate to obtuse; margins plane, entire to irregular denticulate or serrate at leaf tips; costa ending shortly below apex, filling 1/5 of leaf base; upper laminal cells quadrate-rounded, smooth; basal laminal cells elongate, lax and translucent; alar cells not differentiated. **Autoicous. Perichaetia** terminal, leaves similar to stem leaves. **Seta** short to elongate, 2.5--5.0 mm long. **Capsule** erect, urn ovoid to short cylindrical, to 1 mm long, distinctly ribbed when dry; annulus absent or weakly differentiated and persistent. **Operculum** short rostrate, oblique. **Peristome** reduced, teeth smooth or striate, undivided. **Calyptra** cucullate, smooth at base.. **Spores** lightly to rather coarsely papillose.

HABITAT. On rock and in rock crevices in montane regions.

DISCUSSION. This genus differs from *Cynodontium* and *Oreoweisia* in its reduced peristome and capsules with 8 ribs; *Amphidium* is distinguished by its lack of a peristome.

LITERATURE. **De Sloover, J.L. 1973.** Note de bryologie africaine. I. *Brachyodontium*, *Atractylocarpus*, *Amphidium*, *Rhabdoweisia*, *Tayloria*, *Rhacocarpus*, *Trachypodopsis*. Bulletin du Jardin Botanique National de Belgique 43: 333-348.