

Taxonomic Results of the BRYOTROP Expedition to Zaire and Rwanda

19. Pottiaceae

Philip Sollman

Von Weberstraat 32, 6904 KD Zevenaar, Netherlands

Abbreviations:

* New record for Rwanda viz. Zaire

KB: Kahuzi-Biega (Zaire)

Ka: Karisimbi (Rwanda)

Ny: Nyungwe Forest (Rwanda)

Ak: Akagera region (Rwanda)

Ki: Kigali region (Rwanda)

100-171, number of collecting site.

For locality data and a description of the collecting sites see the contribution by E. Fischer on the vegetation of the study area in this volume (Tropical Bryology 8: 13-37, 1993). The specimens are deposited at the Botanical Museum Berlin as well as in the herbarium of the author (except for

If a species is not listed in Kis (1985) for a specific country, nor present in the literature cited below for a special genus or species, I have given that species an indication: new for a country (*).

When for a species or group of taxa no special literature is cited, the identification can usually (also) be made with Magill (1981).

If a remark is given on the distribution in (C.) Africa, also material seen from institutes and private herbaria was considered.

The type citation in this paper follows mainly the recommendations of Frahm & Gradstein (1984). For practical reasons only, I have placed the taxa in alphabetical order.

Barbula Hedw.

**Barbula ehrenbergii* (Lor.) Fl.

Zaire, Prov. Kivu, Ufer des Kivu-Sees, 1450 m, an Felsen direct oberhalb der Wasserlinie, Frahm 9024. Rather rare in Africa. Collections seen of the following two taxa also belong here:

Trichostomum (Hydrogonium) afro-fontanum C. Müll., Hedwigia 38: 99. 1899. *syn. nov.* Type: (S. Africa), Natal, Van Reenen Pass, 1875, A. Rehmman, Musc. austro-afr. no. 82 (sub *Didymodon fontanus*), (BM, PRE, iso's).

Trichostomum (Hydrogonium) brotheri Ren. & Par., Rev. Bryol. 29: 79. 1902. *syn. nov.* Type: Madagascar, territoire dakalave, cercle de Maintirano 1901, native collector s.n., ex herb. E.G. Paris (L, iso).

**Barbula eubryum* C. Müll.

Rwanda, Kigali, on ridge of Bugesera, S. of Kamenze, on soil, 1450 m, *Frahm 6519, 6521.*

**Barbula indica* (Hook.) Spreng.

for a major special study see Zander (1979)
Rwanda, hot springs, 9 km of Bugarama, near
Kabye Cement Factory... on lime tuff, 1150 m,
Pócs 6549.

I have seen circa 300 collections throughout the
total geographical range (pan-tropical). The types
and often some additional material of the follow-
ing taxa have been studied. They belong to
Barbula indica.

Barbula mucronatula Ren. & Card., Bull. Soc.
R. Bot. Belg. 33 (2): 114. 1895. *hom. illeg. syn.*
nov.

Type: Madagascar, inter Tananarive et Betafo,
Imerina, in terra, s.d., Causseque s.n., herb. J.
Cardot (PC).

Barbula rehmannii ("i") C. Müll., Hedwigia 38:
105. 1899. *syn. nov.*

Type: (South Africa), prom. bonae spei, in terra
recente ad flumen Tow Riwer (Touw River),
Nov. 1875, A. Rehmann, in Musc. A.A. no. 101
(BM, PRE, iso's).

Note: scripsis C. Müller on BM-material.

Barbula lambarenensis P. de la Varde, Rev.
Bryol. Lich. 6: 141. 1933. *syn. nov.*

Type: (Gabon), Lambarene, soubassements de
l'église, 1 Feb. 1931, Leg. illegible, s.n., herb.
Varde (PC, iso).

Anoetangium stuhlmannii ("i") Broth., Bot.
Jahrb. 20: 176. 1894. *syn. nov.*

Type: (Tanzania), O. Africa, Sansibar, auf Erde,
5 Nov. 1888, Stuhlmann Ser. I no. 1187 p.p., det.
Brotherus (H, holo).

Hyophila girodi ("i") Ren. & Card., Bull. Soc.
R. Bot. Belg. 41 (1): 52. 1905. *syn. nov.*

Type: Madagascar, ile Ste Marie, sur le sable de
la plage, 1899, Giroton-Genet s.n., herb. J. Cardot
(PC; BR, S).

Pottia (Hyophila) mülleri Duby, Mem. Soc. Phys.
Hist. Nat. Geneve 20: 355 + fig. 4. 1869. *syn. nov.*

Type: (Malaya), peninsula Malakar, Talli-cherry,
s.d., Müller missionaris s.n., herb. Boissier, resp.
Duby (S, iso).

Pottia (Hyophila) papillinervis Lor., Moosstu-
dien 160. 1864. *syn. nov.* Type: (Tanzania), in

insula Zanzibar, s.d., Röschner s.n., herb. Ham-
pe (BM, iso).

Barbula (?) dorrii Ren. & Card., *Hyophila cla-*
vicostata Ren. & Card., *Hyophila leioneura*
Ren. & Card. Material of these three taxa is
practically identical to each other and to *B.*
indica. They diverge mainly in the gemmae
cluster at the apex of the costa (more or less
clearly developed and not always present on all
leaves). Eventually this material can be recognized
as a local variant at variety level at most. Only
nonfruiting plants were seen. The type citation
for these three taxa is as follows:

Barbula (?) dorrii Ren. & Card., Bull. Soc. R.
Bot. Belg. 35 (1): 309. 1897. *syn. nov.* Type:
Madagascar, Mahajamba, in tractu occid., ...
Sept. 1896, Dorr s.n., herb. Motelay, in herb. F.
Renauld (PC).

Hyophila clavicostata Ren. & Card., Act. Soc.
Linn. Bordeaux 53: 21. 1898. *syn. nov.* Type:
Madagascar, Ankaladine, circa Suberbieville,
Jan. 1897, Dorr s.n., herb. F. Renauld, in herb. G.
Roth/Hj. Möller (S, iso). Note: 1. type not located
in PC; 2. type material in S filed under
Hydrogonium.

Hyophila leioneura Ren. & Card., Rev. Bryol.
29: 85. 1902. *syn. nov.* Type: Madagascar, circle
au Moramanga, 1901, native collector s.n., herb.
E.G. Paris (PC, S).

***Bryoerythrophyllum* Chen**

for major partial studies see Zander (1978, 1986)

Bryoerythrophyllum campylocarpum (C. Müll.)
Crum

Ka: 159: *Pócs* 8295. Rather well distributed in
Central and Southern America. In Crum (1957)
the complex (*Br. campylocarpum - jamesonii*)
goes into two parts. See also Long (1982) and
Zander (1986). *Bryoerythrophyllum jamesonii*
is restricted to South Africa. So, the reference in
Kis (1985) refers to *Br. campylocarpum s.str.*
The description and figure in Magill (1981) also
belongs to *Br. campylocarpum s.str.* The type of
the following taxon belongs here: *Hyophila*
calymperoides Ther. & Nav., Bull. Soc. R. Bot.

Belg. 60: 28 + fig. 10. 1927. *syn. nov.* Type: (Uganda), Ruwenzori, Lamia, ca. 2500 m, sur pierre humide ombragee, 18 May 1914, J. Bequart 4369 (BR). Note: type material not located in PC.

At the moment I have not checked all the local names. Some of them, may belong here.

**Bryoerythrophyllum recurvirostrum* (Hedw.) Chen

Ka: 163: *Pócs 8138*; 164: *Pócs 8157A*. A subcosmopolite species.

Also present in Central Africa, but at the moment outside these countries, are: *Br. ferruginascens* (Stirt.) Giac., *Br. inaequalifolium* (Tayl.) Zand. (Ethiopia), and *Br. recurvum* (Griff.) K. Saito. They can still be expected.

(*Didymodon* Hedw.)

(Not present in the Bryotrop material. From the following taxa I saw material collected in C. Africa: *D. asperifolius* (Mitt.) Crum, Steere & Anderson, *D. australasiae* (Hook. & Grev.) Zand., *D. michiganensis* (Steere) K. Saito (Ethiopia), *D. rigidulus* Hedw. emend. Zander, *D. vinealis* (Brid.) Zand.).

Hyophila Brid.

Hyophila involuta (Hook.) Jaeg.

Zaire, prov. Kivu, Irangi Forest Station, 110 km W. of Bukavu Site, 850 m, on concrete wall, *Frahm 6650*, *Pócs 6887*.

Hyophila involuta is a weedy and rather variable subcosmopolite. I have seen circa 2500 collections worldwide and nearly all the types listed by the Index Muscorum (Wijk c.s. 1959/1969). The local names are not used here. I am working towards a revision of the genus.

Leptodontium (C. Müll.) Lindb.

for major partial revisions see Zander (1972) and De Sloover (1987)

Leptodontium flexifolium (With.) Hampe ex Lindb.

Ka: 159: *Frahm 8091*; 162: *Pócs 8102*. Not rare at higher altitudes. Also present in South Africa (Lesotho): *van Zanten c.s. 76.09.925A*, *76.09.930*.

Leptodontium longicaule Mitt.

KB: 132: *Frahm 6931*; 145: *Frahm 7895*. Rather rarely collected in Central Africa.

Leptodontium viticulosoides (P. Beauv.) Wijk & Marg.

KB: 128: *Frey & Kürschner 7314*; 132: *Frahm 6924*, *Frey & Kürschner 6902*, *Pócs 7129*, *7140*, *7147*; 133: *Pócs: 7210*, *7211*; 135: *Frey & Kürschner 7007*; *Pócs 7237*; 137: *Frahm 6949*; 139: *Pocs 7304*; 142: *Pócs 7360*; 144: *Pócs 7797*; 145: *Frey & Kürschner 7485*, *Pócs 7592*; 152: *Frahm 7561*. **Ka:** 162: *Pócs 8249*. **Ny:** 101: *Pócs 6006*; 102: *Frahm 6136*, *Pócs 6035*; 103: *Frahm 6134*; 104: *Frahm 6199*; 108: *Frahm 6340*; 112: *Frey & Kürschner 7939*; 155: *Pócs 8009*, *8031*; 157: *Pócs 8177*. Rather common in Central Africa.

Leptodontium wallisii (C. Müll.) Kindb.

Ka: 163: *Frahm 8352*, *Pócs 8142*; 164: *Pócs 8157*. Rather rare, at higher altitudes.

Pseudosymblepharis Broth.

Pseudosymblepharis spec.

Ny: 102: *Frahm 6108*; 103: *Frahm 6176*. **KB:** 135: *Pócs 7228*; 137: *Pócs 7262*; 139: *Pócs 7275*. **Ka:** 159: *Pócs 8175*.

This is a very variable species, throughout its total geographical range, mainly tropical [Africa, Americas, Asia, Australia (Queensland) and Oceania].

Local names are not used here. I have not employed specific names either. At the moment it is not clear to me, what will be the oldest name available.

I have seen circa 600 collections, including about 550 numbers from Asia. A serious revision will probably result in only one pan-tropical species. Compare also Norris & Koponen 1989, p. 93-95. At the moment I have not yet seen all the relevant African types (*Oxystegus* (Limpr.) Hilp., *Pseudosymblepharis* Broth., *Trichostomum* Br.). Heterotypical synonyms are also likely, e.g. taxa described in genera like *Barbula* Hedw., *Hyophila* Brid. and *Tortella* (Lindb.) Limpr.

Furthermore demarcation against *Trichostomum tenuirostre* (Hook. & Tayl.) Lindb. is sometimes (very) difficult.

Collections were seen from the following African countries: Ethiopia, Kenya, Madagascar, Malawi, Reunion, Rwanda, Sierra Leone, South Africa, Tanzania, Zaire and Zimbabwe.

Scopelophila (Mitt.) Lindb.

for major partial revisions see Noguchi (1956) and Zander (1967)

**Scopelophila cataractae* (Mitt.) Broth.

Rwanda, S.E.-Rwanda, E.-edge of Rwanda Plateau near Rugarama, N.E.-escarpment with quartzitic rocks and dry grassland vegetation, on rocks, 1500 m, *Pocs* 8382.

**Scopelophila ligulata* (Spruce) Spruce

Ny: 105: *Frahm* 2370, on wet rock.

Both taxa are new for Africa.

Streptopogon Wils. in Mitt.

**Streptopogon erythrodontus* (Tayl.) Wils.

KB: 118: *Pócs* 6561. **Ka:** 158: *Pócs* 8149; 159: *Pócs* 8121; 162: *Pócs* 8114, 8141, 8183; 164: *Pócs* 8157B, *Frahm* 8292A. Probably (at least) locally, rather common in Central Africa.

Tortula Hedw.

**Tortula cavallii* Negri

Ka: 164: *Frahm* 8242, *Pócs* 8157C.

Probably not rare at higher altitudes in Central Africa.

Also present in Ethiopia.

**Tortula fragilis* Tayl.

KB: 135: *Frahm* 6964. **Ny:** 156: *Pócs* 8043, and: Rwanda, Pref. of Ruhengeri, N. end of Gishvarti Forest ... W. of Gakarava, pasture with boulders, on rock, 2500 m, *Frahm* 8234. Not uncommon in many parts of Africa.

Trichostomum Br.

***Trichostomum brachydontium* Br.

for a major special study see Herzog (1907). Rwanda, Kigali, on the ridge of Bugesera, S. of Kamenze, on soil, 1450 m, *Frahm* 6517.

This is a rather variable subcosmopolite. In the past this taxon has been described far too often under local names. Furthermore mostly based on very restricted and commonly non-fruiting material. Future research will probably reveal many reductions. Heterotypical synonyms are also likely, esp. from the genera *Barbula* Hedw., *Hymenostomum* R. Br., *Hyophila* Brid. and *Weissia* Hedw.

I have now studied and filed circa 450 collections throughout the total geographical range.

For an experimental study on its dispersal abilities, see van Zanten (1978, p. 469).

For Africa I have not seen at the moment all the relevant taxa. The types and (often) some additional material of the following taxa were studied. They belong to *Trichostomum brachydontium*. They are:

Trichostomum (Eutrichostomum) leikipiae C. Müll., *Flora* 73: 481. 1890. *syn. nov.* Type: (Kenya), Africa or. trop., Leikipiae in reg. occid., Mt Kenia, 1887, L. Höhnel s.n. (BR, H, PC, iso's). Note: BR-material with the text: ex herb. C. Müller, *Mus. Bot. Berol.*

Trichostomum decurvifolium Dix., *Journ. of Bot.* 76: 227. 1938. *syn. nov.* Type: Kenya, Oni, near Leikipiae, 23 April 1910, G. Balbo, herb. Dixon ref. no. 273 (BM, holo).

Barbula (?) *sparsifolia* Ren. & Card., *Bull. Soc. R. Bot. Belg.* 33 (2): 115. 1895. *syn. nov.* Type: Bourbon, St. Philippe, s.d., Rodriguez s.n., herb. J. Cardot (PC).

Hymenostomum contortum Kunz, *Flora* 13: 373. 1830. *syn. nov.* Type: (Madeira), Pico branco, ad saxa, dat. illegible, Fr. Holl s.n., ex M (DUIS, iso). Note: annotation R. Düll, 1984: *Trichostomum brachydontium* Br.

Hyophila excurrentinervis Par. & Broth., *Rev. Bryol.* 31: 43. 1904. *syn. nov.* Type: (Guinea), Kouroussa, ad terram argillosum, Termitarum, July 1903, H. Pobeguïn (36), herb. E.G. Paris (H, L, S).

Hyophila kerensis Broth. in Michel., *Bull. Soc. Bot. Ital.* 1909: 155. 1909. *nom. nud.* Material:

(Ethiopia), Colonia Erythraea, Keren, in terra, 7 Feb. 1907, M. da Carbonara 7249, Bryoth. E. Levier; in monte Schiret, pr. Keren, ad saxa, 1600 m, 1 Jan. 1907, M. da Carbonara 7251 (H). Note: both collections annotated by C.C. Townsend, 1979: *Trichostomum brachydontium* Br.

Hyophila treleasei Card. ("treleasei"), Ann. Rep. Missouri Bot. Garden 8: 57 + fig. 3. 1897. *syn. nov.* Type: (Azores), Sta. Maria, 1 July 1896, Wm Trelease, Pl. Az. no. 1383A, herb. J. Cardot (PC, holo).

Hyophila usambarica Broth., Bot. Jahrb. 20: 183. 1894. *syn. nov.* Type: (Tanzania), Usambara, Handel, Maromboi, trockene Hochwälder, auf Erde, 10 Aug. 1893, C. Holst 9033-B, det. Brotherus (H, holo; BR, S, iso's). Note: annotation R.H. Zander, 1987, on H-material: *Trichostomum brachydontium* Br.

Pottia compacta Welw. & Duby, Mem. Soc. Phys. Hist. Nat. Geneve 21 (2): 225 + fig. 5. 1870 (1872). *syn. nov.* Type: Angola, distr. Huilla, ad terminorum ... 3800-5500 p. alt, April 1860, Welwitsch 42 (BM, BR).

Pottia gymnostomoides Welw. & Duby, Mem. Soc. Phys. Hist. Nat. Geneve 21 (2): 226 + fig. 4. 1870 (1872). *syn. nov.* Type: Angola, distr. Pungo, Andongo, 2400-3800 ped. elev., ad rupes umbrosas prope cataractam ... flum. Cuanza, prope Congo, March 1857, Welwitsch 78 (BM, BR, S).

Acknowledgments: I wish to thank the curators of the herbaria mentioned in the text above for making available material.

Literature cited:

Crum, H. (1957). A contribution of the moss flora of Ecuador. - Svensk Bot. Tidskrift 51 (1): 197-206.

Frahm, J.P. & S.R. Gradstein (1984). Some recommendations for the citation of synonyms, types and specimens. Bryological Times 28: 1-2.

Herzog, Th. (1907). Studien über den Formenkreis des *Trichostomum mutabile* Br. - Halle.

Kis, G. (1985). Mosses of South-East tropical Africa; an annotated list with distributional data. - Vacratot, Hungary.

Long, D.G. (1982). *Bryoerythrophyllum caledonicum*, a new moss from Scotland. - J. Bryol. 12: 141-157.

Magill, R.E. (1981). Flora of Southern Africa, Bryophyta, Part I Mosses, fasc. 1: Sphagnaceae-Grimmiaceae. Pretoria.

Noguchi, A. (1956). On some mosses of Merceya, with special reference to the variation and ecology. Kumamoto J. Sc. ser. B 2: 239-257.

Norris, D.H. & T. Koponen (1989). Bryophyte flora of the Huon Peninsula, Papua New Guinea XXVIII. - Acta Bot. Fenn. 137: 81-138.

Sloover, J.L. de (1987). Note de bryologie africaine XIV *Leptodontium*. - Bull. Jard. Bot. Nat. Belg. 57: 425-451.

Wijk, R. van der, c.s. (1959-1969). Index Muscorum I-V. Utrecht.

Zander, R.H. (1967). The New World Distribution of *Scope-lophila* (=Merceya). - Bryologist 70: 405-413.

Zander, R.H. (1972). Revision of the Genus *Leptodontium* (Musci) in the New World. - Bryologist 75: 213-280.

Zander, R.H. (1978). A Synopsis of *Bryoerythrophyllum* and *Morinia* (Pottiaceae) in the New World. Bryologist 81 (4): 539-560.

Zander, R.H. (1979). Notes on *Barbula* and *Pseudocrossidium* (Bryopsida) in North America and an annotated key to the taxa. - Phytologia 44 (4): 177-214.

Zander, R.H. (1986). Notes on *Bryoerythrophyllum* (Musci). - Bryologist 89 (1): 13-16.

Zanten, B.O. van 1978. Experimental studies on transoceanic long-range dispersal of moss spores in the Southern Hemisphere. - J. Hatt. Bot. Lab. 44: 455-482.

