

Taxonomic Results of the BRYOTROP Expedition to Zaire and Rwanda

13. Radulaceae

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| 1. Leaf-lobes with gemmae on margins.....2 | barium of the author (except for unicates). |
| *1. Leaf-lobes without gemmae on margins...3 | *3. Leaf-lobules without auriculate or volute base6 |
| 2. Funnel-shaped gemmae occurring on dorsal margins of leaf lobes; leaf-lobules covering the stem for 1/4-1/3 of the stem-width <i>R. flaccida</i> | 4. Leaf-lobules transverse wide rectangular with volute base <i>R. voluta</i> |
| *2. Discoid gemmae occurring on dorsal margins of leaf-lobes; leaf-lobules extending far beyond the farther edge of the stem
<i>R. quadrata</i> | *4. Leaf-lobules with auriculate base5 |
| 3. Leaf-lobules with auriculate or volute base.. 4 | 5. Leaf-lobules elliptical or bluntly triangular with strongly auriculate base; keels very short and sinuate; gynoecia terminal on short gynoeceal branches <i>R. boryana</i> |
| | *5. Leaf-lobules subquadrate with auriculate base; keels long and substraight or somewhat sinuate; gynoecia terminal on long ordinary branches and stems <i>R. stipatiflora</i> |
| Abbreviations:: | 6. Leaf-lobules with reflexed apical or adaxial margins7 |
| * New record for Rwanda viz. Zaire | *6. Leaf-lobules without reflexed margins <i>R. holstiana</i> |
| KB: Kahuzi-Biega (Zaire) | 7. Leaf-lobules covering the stem for 4/5-1/2 of the stem-wide and with reflexed adaxial margins; cells of stem thin-walled with minute trigones <i>R. comorensis</i> |
| Ka: Karisimbi (Rwanda) | *7. Leaf-lobules extending far beyond the farther edge of the stem and with reflexed apical margins; cells of stem thick-walled with large trigo- |
| Ny: Nyungwe Forest (Rwanda) | |
| Ak: Akagera region (Rwanda) | |
| Ki: Kigali region (Rwanda) | |
| 100-171, number of collecting site. | |
| For locality data and a description 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 her- | |

nes*R. appressa*
Radula appressa Mitt., Phil. Trans. Roy. Soc. London 168:397 (1879).

= *R. angustata* Steph., in Engler (ed.) Bot. Jahrb. Syst. 8:85 (1886). (fide Jones 1977).

= *R. guineensis* Steph., Hedwigia 23:133 (1884). (fide Jones, 1977).

= *R. mascarena* Steph., Hedwigia 23:134 (1884). (fide Jones, 1977).

= *R. molleri* Steph., Spec. Hep. 4:169 (1910). (fide Jones, 1977).

= *R. oblongiloba* Steph., Hedwigia 23:153 (1884). (fide Castle, 1966).

This species is very variable in form, and Jones (1977) reduced the above-cited four species to synonymy of *R. appressa*. Jones (1977) cited "it is likely that *R. appressa* will prove to be identical with *R. javanica* Gottsche." However, *R. appressa* differs from *R. javanica* in many characters. In general appearance, *R. appressa* resembles *R. reflexa* known from SE Asia.

Hab.: On bark and soil.

Alt. Range: Between 850-1500 m alt. at Irangi forest station in Zaire.

Distr.: Sierra Leone, Guinea, Ghana, Western Nigeria, Cameroun, Republique Centrafricaine, St. Tomé, Principé, Zaire, Tanzania, Rodrigues, Mauritius, Réunion, Madagascar (Jones, 1977).

Specim. exam. : **KB**: 126, *Pócs* 6850; 127, *Pócs* 6882.

Radula boryana (Web.) Nees ex Mont., Ann. Sci. Nat. Bot. ser. 2, 18: 13 (1842).

= *R. bipinnata* Mitt., J. Linn. Soc. Bot. 7:166 (1863). (fide Castle, 1937).

= *R. fusco-rufa* Steph., Spec. Hep. 6:508 (1924). (fide Castle, 1937).

= *R. multiramosa* Steph., Spec. Hep. 6:512 (1924). (fide Castle, 1937).

= *R. salogliae* Gola, Mem. Reale Accad. Sci. Torino (ser. 2) 65(1):8 <1914> (1916). (fide Castle, 1969).

= *R. thomeensis* Steph., Spec. Hep. 4:160 (1910). (fide Castle, 1937).

= *R. woodiana* Steph., Spec. Hep. 4:158 (1910). (fide Castle, 1937).

This is a polymorphic species. Many species were described under a different name from Africa and its adjacent area, but these were reduced to synonymy by Castle (1937 & 1969). *R. boryana* seems to be one of the commonest species in Rwanda and Zaire.

Hab.: This species was collected on branches and bark of trees, on cliffs, and on soil.

Alt. Range: Between 900-2040 m alt. in Zaire and 1600-2400 m alt. in Rwanda.

Distr.: Ghana, Cameroun, Fernando Po., St. Tomé, Principé, Zaire, Rwanda, Kenya, Tanzania, Malawi, Rhodesia, Natal, Réunion, Comores, Madagascar (Jones, 1977).

Specim. exam. : **KB**: 120, *Frey & Kürschner* 6585; 122, *Pócs* 6804; 123, *Frey & Kürschner* 6652, *Pócs* 6667, 6669; 124, *Pócs* 6788, *Frey & Kürschner* 6684; 126, *Pócs* 6835, 6853; 152, *Pócs* 7835, *Frey & Kürschner* 7527. **Ny**: 107, *Pócs* 6309; 108, *Pócs* 6367, 6386; 155, *Pócs* 8010.

* ***Radula comorensis*** Steph., Hedwigia 23:132 (1884).

This species is characterized by (1) fragile plants with often caducous, ovate to oval leaf-lobes with rounded apices, (2) leaf-lobes with thin-walled cells, small trigones and a smooth cuticle, (3) subquadrate leaf-lobules often with reflexed adaxial margins, bluntly angular to rounded basal portions, and sinuate, decurrent keels, and (4) leaf-lobules covering from 4/5-1/2 of the stem-width. This species has not been reported previously from continental Africa.

Hab.: It occurs on bark and rotten wood.

Alt. Range: Between 1500-2470 m alt. in Zaire and 1400-2500 m alt. in Rwanda.

Distr.: Mauritius, Réunion (Jones, 1977). New to

Rwanda and Zaire.

Specim. exam.: **KB**: 126, *Frey & Kürschner 6704b*; 133, *Pócs 7217*, *Frey & Kürschner 6971*, 6976; 143, *Pócs 7616*; 144, *Frey & Kürschner 7541*. **Ny**: 133, *Pócs 6149*; 111, *Frey & Kürschner 7936*.

Radula flaccida Lindenb. et Gott., Syn. Hep.: 726 (1847).

This species is characterized by (1) funnel-shaped gemmae occurring on the margins of leaf-lobes, and (2) plants usually growing on living leaves of trees and on fronds of ferns in moist habitats. *R. flaccida* belongs to a member of sect. Epiphyllae Castle ex Grolle. However, Jones (1977) cited "... by no means uncommon on bark, and I have gathered it on earth. It sometimes grows on tree boles in districts where it does not occur on leaves."

Hab.: It occurs on bark of trees.

Alt. Range: It was collected at 850 m alt. in Irangi forest, Zaire.

Distr.: Sierra Leone, Cote D'Ivoire, Ghana, Nigeria, Cameroun, Uganda, Zaire, Tanzania (Jones 1977), Neotropica.

Specim. exam.: **KB**: 127, *Pócs 6877*.

* *Radula holstiana* Steph., In Engler (ed.) Bot. Jahrb. Syst. 22: 320 (1895).

This species is characterized by (1) often caducous, ovate to rarely oval leaf-lobes, (2) oblong leaf-lobules with bluntly to rounded bases which cover the stem for 1/3-1/2 of the stem-width, decurrent abaxial margins and substraight to sinuate keels, (3) leaf-lobes with thin cell walls with or without minute trigones, and (4) a long flat-cylindric perianth. The leaf-lobule forms of this species are similar to that of branches in the depauperate plants of *R. stipatiflora*.

Hab.: It was collected on rocks and bark of trees.

Alt. Range: Between 900-2470 m alt. in Zaire. Distr.: Cameroun, Uganda, Tanzania, Malawi, Burundi, Southern Rhodesia, South Africa, Mauritius, Réunion (Jones 1977). New to Zaire.

Specim. exam.: **KB**: 122, *Pócs 6795*, 6816; 133, *Pócs 7218*; 143, *Pócs 7618*; 152, *Pócs 7844*.

Radula quadrata Gott., Syn. Hep.: 255 (1845).

= *R. recurvifolia* Steph., Hedwigia 27: 63 (1888). *syn. nov.*

= *R. pirottae* Gola, Ann. Bot. 13: 69 (1914). *syn. nov.*

= *R. spongiosa* Steph., Spec. Hep. 4: 168 (1910). *syn. nov.* [Synonyms are African species only.]

Jones (1977) noted that *R. recurvifolia* seems a close relative of *R. mollis* Lindb. & Gott. and/or *R. quadrata* Gott. However he made no attempt to discuss the relationship fully, and also did not reduce *R. recurvifolia* to a synonym of *R. quadrata*.

More recently I have examined many specimens determined as *R. quadrata* and its allied species (including all the types) from the Neotropics, and I compared African specimens determined as *R. recurvifolia* with *R. quadrata* (= *R. mollis*). Consequently I confirmed that *R. recurvifolia* is conspecific with *R. quadrata*.

Hab.: On bark of trees.

Alt. Range: It occurs at between 2250-2600 m alt. in Zaire and 2500 m alt. in Rwanda.

Distr.: Cameroun, Ethiopia, Kenya, Kivu, Tanzania, Natal, Réunion, Madagascar (as *R. recurvifolia* (Jones, 1977), Neotropica).

Specim. exam.: **KB**: 139, *Pócs 7301*, *Frey & Kürschner 7045*; 144, *Frey & Kürschner 7515*. **Ny**: 102, *Fischer 6037*, 6065.

Radula stipatiflora Steph., Spec. Hep. 4: 159 (1910).

= *R. newtoni* Steph., Spec. Hep. 4: 149

(1910). (*vide* Castle, 1965).

This species is characterized by (1) loosely imbricate, ovate leaf-lobes, (2) contiguous, subquadrate (wider than long) leaf-lobules with decurrent abaxial margins and arched adaxial margins, and large basal appendages, and (3) leaf-lobules usually extending far beyond the farther edge of stem.

Hab.: On branches and trunks of trees.

Alt. Range: It occurs at between 1300-3200 m alt in Zaire.

Distr.: Fernando Po., Ethiopia, Uganda, Kenya, Tanzania, Zaire, Rwanda, Malawi, Natal, Transvaal (Jones, 1977).

Specim. exam.: **KB**: 124, *Pócs* 6778; 149, *Pócs* 7734

**Radula voluta* Tayl. ex Gott., Lindenb. et Nees, Syn. Hep.: 255 (1845).

= *R. allamanoi* Gola, Mem. Reale Accad. Sci. Torino (ser. 2) 65(1):8 <1914> (1916). *syn. nov.*

= *R. macroloba* Steph. f. *gigantea* S. Arnell, Bot. Not. 110:25 (1957). *nom. inval.* (*vide* Jones, 1977).

= *R. ramulina* Tayl., London J. Bot. 5:374 (1846).

This species is characterized by (1) large plants (up to 10 cm or more), (2) widely ovate leaf-lobes with rounded auriculate bases which extend far beyond the farther edge of stem, (3) loosely to moderately imbricate, transverse, wide-rectangular leaf-lobules with voluted, auriculate base (very variable in form on same stem), and (4) leaf-lobules with sinuate and not decurrent keels.

I have examined many specimens of *R. voluta* from Ireland and the Neotropics, also I compared *R. allamanoi* with *R. voluta*. There are many cases where there is no distinction between them. Therefore I have reduced *R. allamanoi* to a synonym of *R. voluta*.

Hab.: On bark of trees and on soil.

Alt. Range: It occurs at between 2500-3570 m alt. in Rwanda and 2400 m alt. in Zaire.

Distr.: Uganda, Kenya, Rwanda, Zaire, Tanzania (as *R. allamanoi*, Jones 1977), North and South America, Great Britain. New to Africa!

Specim. exam.: **KB**: 141, *Frahm* 7045. **Ka**: 159, *Pócs* 8306; 162, *Pócs*, 8229. Ny. 103, *Fischer* 6064.

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