



Notes on Early Land Plants Today. 22. New combinations and new synonymy in *Omphalanthus* and *Aureolejeunea* (Lejeuneaceae, Marchantiophyta)

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Omphalanthus Gottsche *et al.* (1845a: 303) and *Aureolejeunea* Schuster (1978: 428) (Lejeuneaceae Cavers (1910: 291) tribe Lejeuneae Dumortier (1822: 111)) are two small, closely related Afro-American genera of eight and six currently accepted species, respectively. *Omphalanthus* is the most widespread of the two and occurs commonly throughout tropical America. The distribution of *Aureolejeunea* is more restricted and it is mainly confined to high elevations in the Andes. In Africa the two genera are very rare and represented by only one species each.

The species recognized in *Omphalanthus* include *O. baracoensis* Reiner-Drehwald *et al.* (2007: 95) from Cuba, the widespread neotropical *O. filiformis* (Swartz 1788: 144) Gottsche *et al.* (1845a: 304), *O. huanucensis* (Gottsche *et al.* 1845b: 335) Gradstein & Buskes (1985: 109) from Peru, *O. jackii* (Stephani 1892: XVII) Gradstein *et al.* (1977: 410) from Bolivia, Peru, Ecuador (including Galapagos Islands) and Nicaragua, *O. ovalis* from Central and northwestern South America, *O. platycoleus* from Costa Rica, Venezuela, Colombia and Bolivia, *O. roccatii* (Gola 1907: 274) Schuster (1963: 96) from East Africa and *O. wallisii* from Mexico, Venezuela, Colombia and Ecuador. Those in *Aureolejeunea* include *A. aurifera* Schuster (1978: 429) and *A. quinquecarinata* Schuster (1978: 429) in páramo of the northern Andes and the Dominican Republic, *A. fulva* from Central America, the northern Andes, the Guayana Highland and SE Brazil, *A. lumae* (Herzog 1939: 15) van Slageren (1985: 121) from Chile (Valdivia), *A. paramicola* (Herzog 1934: 95) Schuster (1987b: 446) from the northern Andes and *A. rotalis* (Hooker & Taylor 1845: 89) Gradstein & Geissler (1997: 179) from St. Helena. The genus *Omphalanthus* is recognized by: 1) relatively robust size and frequently pendent growth; 2) pale yellowish-green to pale brownish color; 3) long and sparingly branched stems with vegetative branches exclusively of the *Lejeunea*-type; 4) stout stems with a thick-walled epidermis and a 4-12 cell wide ventral merophyte; 5) leaf cells with large, swollen trigones, 0 or 1 intermediate thickenings and 3-5 large, coarsely granular oil bodies; 6) short, truncate lobules lacking a tooth or, rarely, with one large tooth (*O. baracoensis*), and with a distal hyaline papilla; 7) large, undivided to shallowly bifid underleaves; 8) plants dioicous; 9) perianths usually subtended by 1 lejeuneoid innovation (rarely 2, innovations lacking in *O. roccatii*) and with 0-5 smooth keels; and 10) capsules with strong nodular thickenings and 30-40 elateroids on valve surfaces, with 22 elaters, and with spores ornamented by more than 10 rosettes (Gradstein *et al.* 2001, 2003b, Weis 2001). *Aureolejeunea* shares many of the above-listed characters with *Omphalanthus* but differs by its creeping to ascending (never pendent) growth, a more darkish brown color, the longer, rectangular lobules, the perianths usually subtended by 2 innovations (rarely 1), and autoicous sex distribution.

Omphalanthus and *Aureolejeunea* are closely related to *Cheilolejeunea* (Spruce 1884: 251) Schiffner (1893: 124), and a recent molecular-phylogenetic analysis has shown that the three genera form a well-supported monophyletic group (Wilson *et al.* 2007, Ye *et al.* 2011) and might be considered congeneric. Since *Omphalanthus* is the oldest generic name in this group but *Cheilolejeunea* has by far the largest number of species, the latter name has been proposed for conservation (Ye *et al.* 2011).

Recent taxonomic work on *Omphalanthus* (Malonek 2002, Gradstein in prep.) has revealed that *O. platycoleus* and *O. wallisii* should be reduced to varietal rank under *O. filiformis*. The three species differ by only one character, viz. the shape of the perianth which is eplicate in *O. filiformis*, bluntly 4-angled in *O. platycoleus* and 5-keeled in *O. wallisii*, and therefore do not merit species rank (e.g., Gradstein 1975). The name *Omphalanthus filiformis* var. *platycoleus* "(Herzog) Malonek" has already been used by Gradstein *et al.* (2003a) without making the formal combination.

Gradstein & Buskes (1985) had earlier suggested that *Archilejeunea tonduzana* from Costa Rica might be conspecific with *Omphalanthus platycoleus* (= *O. filiformis* var. *platycoleus*). However, *A. tonduzana* is autoicous whereas *O. platycoleus* and all other taxa in *Omphalanthus* are dioicous (the suggestion by Gradstein *et al.* (1981) that *O. jackii* and *O. ovalis* are autoicous is an error). Therefore, the conspecificity of *A. tonduzana* and *O. platycoleus* remained questionable. Our recent study of the type of *A. tonduzana* showed that this species is similar in all respects to *Aureolejeunea fulva* and represents an older name for the latter. The species is readily recognized by the autoicous condition, the frequently rather pale plant color (all other species of *Aureolejeunea* are rather darkish pigmented), the gynoecia with often only one innovation and, especially, the bluntly 4-angled perianth with a recessed, rudimentary beak and somewhat inflated keels (Schuster, 1987a). In view of its wide distribution, the discovery of an older name for *A. fulva* (described in 1978) is not unexpected.

Our taxonomic studies have furthermore shown that *Peltolejeunea rotundistipula* from Ecuador, the last remaining unrevised name in the genus *Peltolejeunea* (Spruce 1884: 85) Schiffner (1893: 131) (= *Omphalanthus*), is a synonym of *Omphalanthus ovalis*.

The purpose of this note is to make the necessary transfers and new combinations.

Formal treatment

The format of this note follows Söderström *et al.* (2012).

Aureolejeunea tonduzana (Steph.) Gradst. *comb. nov.*

Basionym:—*Archilejeunea tonduzana* Steph., *Sp. Hepat. (Stephani)* 4: 721, 1911 (Stephani 1911).

Type:—COSTA RICA. Forêts du Río Naranjo, 200-250 m, 1893, *Tonduz 3016* (holotype G-46867).

= *Aureolejeunea fulva* R.M.Schust. *Phytologia* 39(6): 429, 1978 (Schuster 1978), **syn. nov.** Type:—VENEZUELA. Est. Mérida: La Carbonera, in montane forest at 2300-2350 m, 1976, *Schuster & Ruiz-Terán 76-805* (holotype F, *non vidi*).

Omphalanthus filiformis var. *platycoleus* (Herzog) Gradst. *comb. et stat. nov.*

Basionym:—*Omphalanthus platycoleus* Herzog, *Feddes Repert. Spec. Nov. Regni Veget.* 57: 171, 1955 (Herzog 1955).

Type:—COLOMBIA. Dept. Cauca: Cordillera Occidental, San Antonio, 1922, leg. *Pennell & Killip 7301* (holotype JE).

≡ *Omphalanthus filiformis* var. *platycoleus* (Herzog) Malonek, *J. Hattori Bot. Lab.* 93: 23, 2003 (Gradstein *et al.* 2003a) *nom. inval.* (Art. 33.2; basionym not cited).

Omphalanthus filiformis var. *wallisii* (J.B.Jack et Steph.) Gradst. *comb. et stat. nov.*

Basionym:—*Lejeunea wallisii* J.B.Jack et Steph, *Hedwigia* 31: XVII, 19, 1892 (Jack & Stephani 1892).

Type:—COLOMBIA ("Nova Granada"). Dept. Antioquia: Páramo de Sonson, 10,000 ft., 1872, *G. Wallis s.n.* (holotype G-61044 [=G-19437]¹).

1. Citation of specimens in G should preferably use the barcode (M. Price, pers. comm.) but for comparability the numbers printed on the specimen, which have often been cited by previous authors, are also given here in square brackets.

≡ *Omphalanthus wallisii* (J.B.Jack et Steph.) Gradst. 1979, *J. Hattori Bot. Lab.* 45: 123, 1979 (Gradstein & Hekking 1979).

≡ *Peltolejeunea wallisii* (J.B.Jack et Steph.) J.B.Jack et Steph., *Sp. Hepat. (Stephani)* 4: 699, 1911 (Stephani 1911).

Omphalanthus ovalis (Lindenb. et Gottsche) Gradst., *Lindbergia* 23: 77, 1977 (Gradstein *et al.* 1977).

Basionym:—*Lejeunea ovalis* Lindenb. & Gottsche, *Syn. Hepat.*: 754, 1847 (Gottsche *et al.* 1847).

Lectotype (**here designated**):—VENEZUELA. Mérida: *Moritz s.n.* ([G-19432], isolectotypes BM (2 colls.), [G-19420], [G-19426], S-B21040, S-B21047, W-6271).

≡ *Peltolejeunea ovalis* (Lindenb. & Gottsche) Schiffn., *Natürl. Pflanzenfam.* 1, 3: 131, 1893 (Schiffner 1893).

= *Peltolejeunea rotundistipula* Steph., *Hedwigia* 35: 123, 1896 (Stephani 1896), **syn. nov.** Holotype: ECUADOR. Without locality, ex hb. *Renauld*, G-01174.

Acknowledgment

I am grateful to Dr. Milena Malonek (Göttingen) for comments on the manuscript and to Dr. Lars Söderström (Trondheim) for his useful advice.

References

- Cavers, F. (1910) The interrelationships of the Bryophyta. *New Phytologist* 9: 269–304.
- Dumortier, B.C. (1822) *Commentationes botanicae*. Ch. Casterman-Dien, Tournay, 118 pp.
- Gola, G. (1907) Species novae in excelsis Ruwenzori in expeditione Ducis Aprutii Lectae. III: Hepaticae. *Annali di botanica*. Roma 6: 271–276.
- Gottsche, C.M., Lindenberg, J.B.G. & Nees von Esenbeck, S.G. (1845a) *Synopsis Hepaticarum, fasc. 2*. Meissner, Hamburg, pp. 145–304.
- Gottsche, C.M., Lindenberg, J.B.G. & Nees von Esenbeck, S.G. (1845b) *Synopsis Hepaticarum, fasc. 3*. Meissner, Hamburg, pp. 305–464.
- Gottsche, C.M., Lindenberg, J.B.G. & Nees von Esenbeck, C.G. (1847) *Synopsis Hepaticarum, fasc. 5*. Meissner, Hamburg, pp. 625–834.
- Gradstein, S.R. (1975) A Monograph of the genus *Acrolejeunea*. *Bryophytorum Bibliotheca* 4: 1–216.
- Gradstein, S.R. & Buskes, G.M. (1985) A revision of neotropical *Archilejeunea* (Spruce) Schiffn. *Beihefte zur Nova Hedwigia* 80: 89–112.
- Gradstein, S.R. & Hekking, W.H.A. (1979) Studies on Colombian Cryptogams IV. A catalogue of the Hepaticae of Colombia. *Journal of the Hattori Botanical Laboratory* 45: 93–144.
- Gradstein, S.R., Churchill, S.P. & Salazar-Allen, N. (2001) Guide to the Bryophytes of Tropical America. *Memoirs of the New York Botanical Garden* 86: 1–577.
- Gradstein, S.R., Cleef, A.M. & Fulford, M.H. (1977) Oil body structure and ecological distribution of selected species of Andean Jungermanniales. *Proceedings of the Koninklijke Nederlandse Akademie der Wetenschappen Ser. C*, 80: 377–420.
- Gradstein, S.R., Matsuda, R. & Asakawa, Y. (1981) Oil bodies and terpenoids in Lejeuneaceae and other selected Hepaticae. *Journal of the Hattori Botanical Laboratory* 50: 231–248.
- Gradstein, S.R., Meneses, R.I. & Arbe, B.A. (2003a) Catalogue of the Hepaticae and Anthocerotae of Bolivia. *Journal of the Hattori Botanical Laboratory* 93: 1–67.
- Gradstein, S.R., Reiner-Drehwald, M.E. & Schneider, H. (2003b) A phylogenetic analysis of the genera of Lejeuneaceae (Hepaticae). *Botanical Journal of the Linnean Society* 143: 391–410.
- Herzog, T. (1934) Die Bryophyten der Andenreisen von C. Troll. *Hedwigia* 74: 79–114.
- Herzog, T. (1939) Zur Bryophytenflora Südchiles. I. Verzeichnis der gesammelten Bryophyten. *Beihefte des Botanischen Centralblattes*, Abt. B, 60: 1–35.
- Herzog, T. (1955) Hepaticae aus Columbia und Peru. *Feddes Repertorium specierum novarum regni vegetabilis* 57: 156–203.
- Jack, J.B. & Stephani, F. (1892) Hepaticae Wallisiana. *Hedwigia* 31: 11–27.
- Malonek, M. (2002) *Taxonomische Revision der Gattung Omphalanthus (Lejeuneaceae, Hepaticae)*. Diplomarbeit, Biologische Fakultät der Georg-August-Universität Göttingen, Göttingen, pp. 1–95.