

## Two new Lejeuneaceae records for the Colombian liverwort flora

Juan C. Benavides. - Tropenbos-Colombia.

Instituto de Biología, Universidad de Antioquia. AA. 1226 Medellín, Colombia.  
Email: [jbenavid@science.uva.nl](mailto:jbenavid@science.uva.nl)

**Abstract:** Two epiphyllous Lejeuneaceae, *Cololejeunea surinamensis* and *Drepanolejeunea polyrhiza*, previously known from Amazonian Brazil, are recorded for the first time in Colombia. They were found as epiphylls on understory shrubs in the middle Caquetá area in Colombian Amazonia. *Cololejeunea surinamensis* was found in the Tierra Firme forests and *D. polyrhiza* was found in the floodplains of the Caquetá River.

**Resumen:** Dos especies de Lejeuneaceae epífilas, *Cololejeunea surinamensis* y *Drepanolejeunea polyrhiza*, previamente conocidas de los bosques amazónicos de Brasil son reportadas por primera vez para Colombia. Las especies fueron encontradas como epífilas sobre hojas de arbustos del sotobosque en el área del medio Caquetá en la amazonía Colombiana. *Cololejeunea surinamensis* fue encontrada en los bosques de tierra firme, mientras que *D. polyrhiza* fue encontrada en los planos inundables del Río Caquetá.

Lowland tropical forests have more liverworts species than has been thought (Gradstein 1992). Nearly 20% of the Colombian liverwort flora has been documented from Amazonia but still huge areas remain unexplored (Uribe & Gradstein 1998). The understory of Amazonian rain forests is particularly rich in epiphyllous liverworts, where they grow luxuriantly (Gradstein & Costa 2003). Despite the increasing information on diversity in Amazonian forests (Pitman et al. 1999) there is scant information about the distribution and ecology of lowland bryophytes, especially epiphylls, because of the taxonomic complexity and subsampling during inventories (Uribe & Gradstein 1998). Epiphyllous liverworts are generally ignored by collectors because the

difficulty in achieving reliable identifications (Lücking 1995) and complete inventories are time-consuming. However, the help of specialists, together with the publication of local floras, has improved the taxonomic resolution in identifying epiphyllous liverworts (e.g., Eggers et al. 2001). Here I present two new records of epiphyllous Lejeuneaceae for the Colombian liverwort flora. The collections were made during explorations of *tierra firme* and *varzea* forest near Araracuara in the Middle Caqueta region of the Colombian Amazonia (Fig. 1). The mean annual temperature was 25.7 ° C (1980-1989) and the mean annual precipitation was 3059 mm in the same period (Lips & Duivenvoorden 2001)

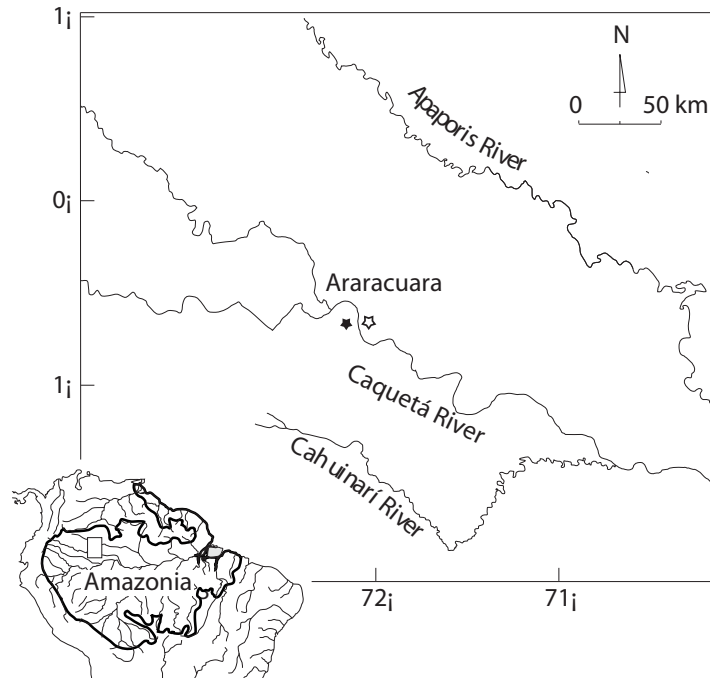


Figure 1. Map of Colombian Amazonia showing the localities of *C. surinamensis* (black mark), and *D. polyrhiza* (white mark) in the middle Caquetá area.

***Cololejeunea surinamensis* Tixier**

Colombia. Caquetá department: Corregimiento de Aracuara, 0°36'S, 72°10' W, Tierra Firme forest, tertiary sedimentary plain, 200 m; epiphyllous on understory shrubs in lowland rain forest. *A. Idarraga* 2476, 2483, 2525, 2724 (HUA). Det. J. C. Benavides.

*Cololejeunea surinamensis* has been previously collected in the Amazonian regions of Surinam and Brazil (Gradstein & Costa 2003, Tixier 1980). For an illustration of this species the reader is referred to Tixier (1980).

The plants of this tiny species are characterized by: 1— presence of one underleaf for each two lateral leaves; 2 — leaves with a hyaline border of 2-3 cells wide and an entire margin; 3 — leaf base scarcely auriculate; 4 — lobule short and less than ¼ the lobe length; and 5 — leaf cuticle punctuate. Also, *C. surinamensis* has been considered one of the most common epiphylls liverworts in the Amazonian forests (Pócs in Gradstein & Costa 2003).

***Drepanolejeunea polyrhiza* (Nees) Grolle & Zhu**

Syn. *Rhaphidolejeunea polyrhiza* (Nees) Bischl. Colombia. Caquetá department: Corregimiento de Aracuara, 0°36'S, 72°10' W, periodically flooded terrace along the Caquetá River, 150 m; epiphyllous in understory shrubs. *A. Idarraga* 2656, 2748, 2662, 2750 (HUA). *Drepanolejeunea polyrhiza* has been previously collected in the Amazonian regions of Venezuela and Brazil (Gradstein & Costa 2003).

*Drepanolejeunea polyrhiza* grows on the leaf surfaces of shrubs in the rain forest understory in the Colombian Amazon. Diagnostic characters are: 1 — Ventral lobule (when well developed) with a sharp curved tooth of 2-3 cells long; 2 — leaves with two ocelli separated by one non-specialized cell; 3 — underleaves widely spreading, with filiform segments composed of 2-3 linear cells each; and 4 — leaves with entire margins and rounded apices (Fig. 2). Well-developed lobules were found in less than 25% of the stems in the material examined, the majority of the lobules were

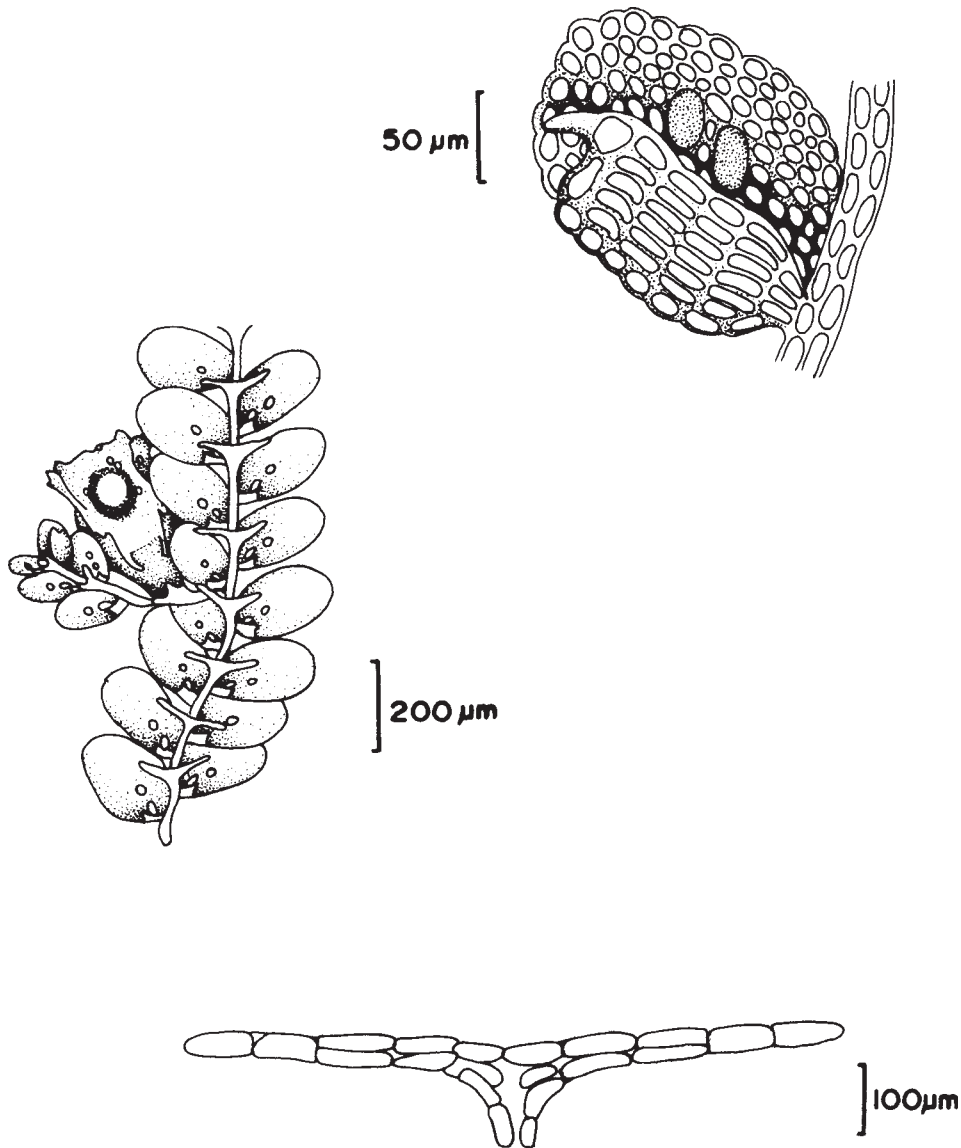


Figure 2. *Drepanolejeunea polyrhiza* general aspect (left), detail showing the tooth in a well developed lobule (upper right), underleaf (lower right).

reduced and showed only a small blunt fold. The species could be confused with *D. bischlerae* (Grolle) Grolle & Zhu but it has denticulate leaf margins and has been reported in Malaysia and New Guinea (Grolle and Zhu 2000). *Drepanolejeunea polyrhiza* is one of the few obligate epiphyllous liverworts and is widespread in the Amazonian lowland forest (Gradstein & Costa 2003).

#### Acknowledgments

The author want to express his gratitude to A. Idarraga and E. Alvarez who facilitated the liverwort collections, to Consuelo Garcia who made the drawing of *D. polyrhiza* and to the staff of the herbarium of the University de Antioquia (HUA) for supporting this study.

## Literature

- Eggers, J., Stevenson, C.R., R.D. Poley & M. Stech. 2001.** New bryophyte taxon records for tropical countries IV. *Tropical Bryology* 20: 97-100.
- Gradstein, S.R. 1992.** The vanishing tropical rain forest as an environment for bryophytes and lichens, pp. 234-258. *In*: J. W. Bates & A. M. Farmer (eds.), *Bryophytes and lichens in a changing environment*. Clarendon Press, Oxford.
- Gradstein, S. R. & da Costa D.P. 2003.** The liverworts and hornworts of Brazil. *Memoirs of the New York Botanical Garden* 88: 1-316.
- Grolle, R. & Zhu, R.L. 2000.** A study of *Drepanolejeunea* subg. *Rhaphidolejeunea* (Herzog) Grolle & Zhu, stat. nov. (Hepaticae, Lejeuneaceae) in China with notes on its species elsewhere. *Nova Hedwigia* 70: 373-396.
- Lips, L. & Duivenvoorden, J.F. 2001.** Caracterización ambiental, pp. 19-46. *In*: Duivenvoorden, J.F. (ed.), *Evaluación de recursos vegetales no maderables en la Amazonía noroccidental*. IBED, Universiteit van Amsterdam, Amsterdam.
- Lücking, A. 1995.** Diversität und Mikrohabitatpräferenzen epiphyller Moose in einem tropischen Regenwald in Costa Rica. Doctoral Dissertation. Universität Ulm, Germany.
- Pitman, N.C.A., Terborgh, J., Silman, M.R. & Nuñez-V, P. 1999.** Tree species distributions in an upper Amazonian forest. *Ecology*: 80: 2651-2661.
- Tixier, P. 1980.** Contribution à l'étude du genre *Cololejeunea* (Lejeuneacées). IX — Espèces nouvelles du sous-genre *Pedinolejeunea* (Ben.) Mizutani en région néotropicale. *Bradea* 3: 35-44.
- Uribe M., J. & Gradstein, S.R. 1998.** Catalogue of the Hepaticae and Anthocerotae of Colombia. *Bryophytorum Bibliotheca* 53: 1-100.