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The reappraisal of *Capillolejeunea* S.W.Arnell (Marchantiophyta, Lejeuneaceae)

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Abstract

Capillolejeunea (Lejeuneaceae), known only from the East African Islands, is resurrected. It is characterized by and easily separated from *Drepanolejeunea* by the unbroken basal vitta of 3−5(−9) ocelli in leaf lobes, absence of scattered ocelli in leaf lobes, outer lateral margin of the upright underleaf lobes with a tooth, and single, unicellular tooth of the leaf lobule. The Madagascarian *Drepanolejeunea geisslerae* is transferred to *Capillolejeunea*. *Capillolejeunea* is the only liverwort genus endemic to Africa. A key to known species of *Capillolejeunea* is provided.

Key words: East African Islands, *Drepanolejeunea, Microlejeunea, Rectolejeunea, Vitalianthus*

Introduction

Capillolejeunea Arnell (1965: 69), a monospecific genus, was established based on *Capillolejeunea mascarena* Arnell (1965: 69) from Mauritius. The most striking features of the plant are the asymmetrically falcate leaves usually with ciliate teeth at apex, single, unicellular, somewhat curved, apical tooth of the leaf lobule with a hyaline papilla at its proximal base, unbroken basal vitta of 3−5 ocelli in leaf lobes, absence of scattered ocelli in leaf lobes, bilobed underleaves with upright lobes usually with a tooth on their outer margins, and gynoecial innovations with a pycnolejeuneoid leaf sequence (Arnell 1965; Zhu & Grolle 2003). Owing to the above-mentioned features of the species also occurring in *Drepanolejeunea* (Spruce 1884: 186) Stephani (1891: 209). Zhu & Grolle (2003) reduced *Capillolejeunea* to a synonym of *Drepanolejeunea*, and transferred *Capillolejeunea mascarena* to *Drepanolejeunea* as *D. mascarena* (Arnell 1965: 69) Zhu & Grolle (2003: 467).

In the course of our studies on the taxonomy and phylogeny of *Drepanolejeunea*, we found that the combination of several important features such as the 3−5 (−9) moniliate ocelli in a continuous row in the leaf lobes, lack of scattered ocelli in the leaf lobe, bilobed underleaves with upright lobes usually with a tooth on their outer margins, and a single lobular tooth is unique in two *Drepanolejeunea* species restricted to the East African islands (*Drepanolejeunea mascarena* and *D. geisslerae* Pócs (2001: 70)) and not found in any other species of this genus. Our unpublished molecular data (*rbcL*, ITS, *trnG* and *trnL-F*) also show that *Drepanolejeunea mascarena* and *D. geisslerae* are separated from the *Drepanolejeunea* clade, and that the two species form a monophyletic lineage near *Rectolejeunea* Evans (1906: 8). Morphologically *Rectolejeunea*, however, is immediately distinguished from *D. mascarena* and *D. geisslerae* by several reliable features such as the robust stem with 7−10 rows of medullary cells, the absence of oil bodies in ordinary cells of the leaf lobe, presence of scattered ocelli in the leaf lobe, and absence of an unbroken vitta of 3−5 moniliate ocelli. Therefore, morphological, molecular, and distributional evidence support that *Capillolejeunea* represents a good, natural group. The generic status of *Capillolejeunea*, thus, has to be resurrected and the following treatment is necessary.

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Gradstein (2003) established a new classification of Lejeuneaceae. He placed *Drepanolejeunea* in the subtribe Drepanolejeuneinae Gradstein (2003: 14), which contains two genera: *Drepanolejeunea* and *Vitalianthus*. Although *Capillolejeunea* is most similar to *Drepanolejeunea* in morphology, our preliminary molecular data reveal that *Capillolejeunea* is much closer to the subtribe Lepidolejeuneinae Gradstein (2013: 13), which includes two genera: *Lepidolejeunea* Schuster (1963: 139) and *Rectolejeunea*. The presence of oil bodies in green cells, the slender stem with seven cortical cells and only three medullary ones in the transverse section, and the absence of scattered ocelli in the leaf lobe, however, are rather different from Lepidolejeuneinae. The exact systematic position of *Capillolejeunea* still remains uncertain pending intensive sporophytic and molecular investigations of *Rectolejeunea* and *Lepidolejeunea*, and other related genera.

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References

Arnell, S.W. (1965) Hepaticae collected by Mr. Gillis Een in Mauritius and Réunion in 1962. *Svensk Botanisk Tidskrift* 59: 65−84.

Dauphin, G. (2003) The genus *Ceratolejeunea* Jack & Steph. (Hepaticae: Lejeuneaceae) in Tropical America. *Flora Neotropica, Monograph* 90: 1−86.

Dong, S.S., Schäfer-Verwimp, A., Pócs, T., Feldberg, K., Czumaj, A., Schmidt, A.R., Schneider, H. & Heinrichs, J. (2013) Size doesn't matter-recircumscription of *Microlejeunea* (Lejeuneaceae, Porellales) based on molecular and morphological evidence. *Phytotaxa* 85: 41−45.
http://dx.doi.org/10.11646/phytotaxa.85.2.2

Evans, A.W. (1906) Hepaticae of Puerto Rico. VI. *Cheilolejeunea*, *Rectolejeunea*, *Cystolejeunea*, and *Pycnolejeunea*. *Bulletin of the Torrey Botanical Club* 33: 1–25.
http://dx.doi.org/10.2307/2478618

Gradstein, S.R. (2013) A classification of Lejeuneaceae (Marchantiophyta) based on molecular and morphological evidence. *Phytotaxa* 100: 6−20.
http://dx.doi.org/10.11646/phytotaxa.100.1.2

Grolle, R. (1976) *Drepanolejeunea* subgen. *Kolpolejeunea* – eine neue Untergattung aus der Palaeotropis. *Journal of the Hattori Botanical Laboratory* 40: 191−216.

Grolle, R. (1986 [1985]) Zur Kenntnis der Lebermoosgattung *Otolejeunea*. *Haussknechtia* 2: 45−56.

Grolle, R. & Onraedt, M (1974) Lebermoose aus Madagaskar und den Maskarenen (1). *Lindbergia* 2: 230–233.

He, Q., Zhu, R.-L., Chantanaorrapint, S., Kornochalert, S. & Printarakul, N. (2012a) *Drepanolejeunea laciniata* (Lejeuneaceae), a new species from northern Thailand. *Cryptogamie, Bryologie* 33: 291−298.
http://dx.doi.org/10.7872/cryb.v33.iss3.2012.291

He, Q., Wei, Y.-M. & Zhu, R.-L. (2012b) *Vitalianthus guangxianus* R.L.Zhu, Q.He & Y.M.Wei (Lejeuneaceae), sp. nov. from Guangxi, China. *Journal of Bryology* 34: 32−36.
http://dx.doi.org/10.1179/1743282011y.0000000038

Jack, J.B. & Stephani, F. (1892) Hepaticae Wallisianae. *Hedwigia* 31: 11–27.

Kachroo, P. & Schuster, R.M. (1961) The genus *Pycnolejeunea* and its affinities to *Cheilolejeunea*, *Euosmolejeunea*, *Nipponolejeunea*, *Tuyamaella*, *Siphonolejeunea* and *Strepsilejeunea*. *Journal of the Linnean Society. Botany* 56: 475–511.
http://dx.doi.org/10.1111/j.1095-8339.1961.tb02542.x

Jovet-Ast, S. & Tixier, P. (1962) Hépatiques du Viet-Nam. II. *Revue Bryologique et Lichénologique* 31: 23−33.

Lee, G.E. (2013) A systematic revision of the genus *Lejeunea* Lib. (Marchantiophyta: Lejeuneaceae) in Malaysia. *Cryptogamie, Bryologie* 34: 381−484.
http://dx.doi.org/10.7872/cryb.v34.iss4.2013.381

Marline, L., Andriamiarisoa, R.L., Bardat, J., Chuah-Petiot, M., Hedderson, T.A.J., Reeb, C., Strasberg, D., Wilding, N. & Ah-Peng, C.

(2012) Checklist of the bryophytes of Madagascar. *Cryptogamie, Bryologie* 33: 199−255.
http://dx.doi.org/10.7872/cryb.v33.iss3.2012.199

Mizutani, M. (1978) Lejeuneaceae from Ishigaki and Iriomote Islands of Ryukyu Archipelago. *Journal of the Hattori Botanical Laboratory* 44: 121−136.

Mizutani, M. (1979) Notes on the Lejeuneaceae. 2. Some peculiar Asiatic species in the Rijksherbarium, Leiden. *Journal of the Hattori Botanical Laboratory* 46: 357–372.

Mizutani, M. (1981) Notes on the Lejeuneaceae. 5. Some Asiatic species of the genus *Ceratolejeunea*. *Journal of the Hattori Botanical Laboratory* 49: 305−318.

Pócs, T. (2001) East African Bryophytes, XVI. New taxa of Lejeuneoideae (Lejeuneaceae) collected in Manongarivo Special Reserve, NW Madagascar. *Candollea* 56: 69−78.

Reiner-Drehwald, M.E. & Grolle, R. (2012) Review of the genus *Rectolejeunea* (Lejeuneaceae, Marchantiophyta). *Nova Hedwigia* 95: 451−482.
http://dx.doi.org/10.1127/0029-5035/2012/0063

Sande Lacoste, C.M. (1855) Novae species Hepaticarum ex insula Java detexit Dr. F. Junghuhn. Nederlandsch Kruidkundig Archief. *Verslagen en Mededelingen der Nederlandsche Botanische Vereeniging* 3: 415–424.

Schuster, R.M. (1963) An annotated synopsis of the genera and subgenera of Lejeuneaceae. I. Introduction; annotated keys to subfamilies and genera. *Beihefte zur Nova Hedwigia* 9: 1–203.

Schuster, R.M. & Giancotti, C. (1993) On *Vitalianthus* Schust. & Giancotti, a new genus of Lejeuneaceae. *Nova Hedwigia* 57: 445−456.

Spruce, R. (1884) Hepaticae of the Amazon and the Andes of Peru and Ecuador. *Transactions and Proceedings of the Botanical Society of Edinburgh* 15: 1–308.

Stephani, F. (1888) Hepaticae africanae. *Hedwigia* 27: 59–63.

Stephani, F. (1890) Hepaticae africanae novae in insulis Bourbon, Maurice et Madagascar lectae. *Botanical Gazette* 15: 281–292.
http://dx.doi.org/10.1086/326585

Stephani, F, (1891) Hepaticae africanae. *Hedwigia* 30: 201–217.

Stephani, F (1913) *Species Hepaticarum* 5. George & Cie, Genève & Bale, pp. 177–448.

Tixier, P. (1980) Deux nouveaux genres de Lejeunéacées, *Otolejeunea* Grolle et P. Tx. et *Allorgella* P. Tx. *Nova Hedwigia* 32: 607–622.

Tixier, P. (1993) Bryophytes nouveaux pour la science et l'île Maurice. *Proceedings of the Royal Society of Arts and Sciences of Mauritius* 5: 41−48.

Wei, Y.-M. & Zhu, R.-L. (2013) Transfer of two Asiatic taxa from *Lejeunea* to *Microlejeunea* (Lejeuneaceae, Marchantiophyta). *Cryptogamie, Bryologie* 34: 307−311.

Wei, Y.-M., He, Q., Gradstein, S.R., Campos, L.V. & Zhu, R-L. (2013) Notes on Early Land Plants Today. 46. Transfer of *Vitalianthus urubuensis* (Marchantiophyta, Lejeuneaceae) to *Cheilolejeunea*. *Phytotaxa* 152: 50−52.
http://dx.doi.org/10.11646/phytotaxa.152.1.5

Zartman, C.E. & Ackerman, I.L. (2002) A new species of *Vitalianthus* (Lejeuneaceae, Hepaticae) from the Brazilian Amazon. *The Bryologist* 105: 267–269.
http://dx.doi.org/10.1639/0007-2745(2002)105[0267:ansovl]2.0.co;2

Zhu, R-L & Grolle, R. (2003) On the genus *Capillolejeunea* (Lejeuneaceae, Hepaticae) from the East African islands. *Systematic Botany* 28: 467−470.

Zhu, R.-L. & So, M.L. (2001) Epiphyllous liverworts of China. *Nova Hedwigia Beiheft* 121: 1−418.

Zhu, R.-L., So, M.L. & Wang, Y.-F. (2002) The genus *Cheilolejeunea* (Hepaticae, Lejeuneaceae) in China. *Nova Hedwigia* 75: 387−408.
http://dx.doi.org/10.1127/0029-5035/2002/0075-0387