



Notes on Early Land Plants Today. 67. Notes on Lejeuneaceae subtribus Cololejeuneinae (Marchantiophyta)

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Abstract

Cololejeunea subg. *Aphanolejeunea* is validated. Two new combinations, one validated species name, 14 new synonyms and four new lectotypes in *Cololejeunea* are proposed. The genus *Austrolejeunea* is shown to be invalid and all species are transferred to *Nephelolejeunea* making three new combinations and validating five species names.

Introduction

During the work with the forthcoming world checklist of liverworts and hornworts (Söderström *et al.*, in press), several necessary taxonomic and nomenclature changes have come to our attention. Here we present necessary changes in Lejeuneaceae subtrib. Cololejeuneinae (sensu Gradstein 2013). In a molecular study Yu *et al.* (2014) showed the infrageneric structure in the genus *Cololejeunea* (Spruce 1884: 291) Stephani (1891: 208), but it does not correspond to the morphological structure currently used. Until there is a better understanding how the genetic structure corresponds to morphology, a new infrageneric classification is premature. *Aphanolejeunea* Evans (1911: 273) is shown to belong to *Cololejeunea* (Pócs & Bernecker 2009, Yu *et al.* 2014), but the name *Cololejeunea* subg. *Aphanolejeunea* (A. Evans.) Benedix (1953: 15) is invalid (ICN Art. 41.5; basionym not cited). Although it may fall into synonymy of *Cololejeunea* subg. *Cololejeunea* (cf. Yu *et al.* 2014) we are validating it here to be used in the forthcoming world checklist. Some new synonyms and lectotypes in *Cololejeunea* are also proposed.

When Schuster described *Siphonolejeunea* subg. *Austrolejeunea* Schuster (1963a: 187) he did it with a subgeneric-specific description. However, only generic-specific descriptions (ICN Art. 38.5; McNeill *et al.* 2012) are allowed. Thus, when Schuster later the same year elevated the subgenus to genus as *Austrolejeunea* (R.M. Schust.) Schuster (1963b: 244) that combination became invalid as the basionym was not valid (ICN Art. 41.1). The type of *Nephelolejeunea* Grolle (1973: 252), *Nephelolejeunea talinayi* (Arnell 1956: 309) Grolle (1973: 253), was transferred to *Austrolejeunea talinayi* (S.W. Arnell) Pócs (2006: 187) without noticing that *Austrolejeunea* was invalid. However, as long as *Nephelolejeunea talinayi* is regarded congeneric with the type of *Austrolejeunea*, *Austrolejeunea olgae* (Schuster 1963a: 187) Schuster (1963b: 244), *Nephelolejeunea* is available as a generic name. We therefore transfer all *Austrolejeunea* taxa that do not already have a name there to *Nephelolejeunea*.

Formal treatment

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

Cololejeunea* subg. *Aphanolejeunea* (A.Evans) Pócs, *comb. nov.

Basionym:—*Aphanolejeunea* A.Evans, *Bull. Torrey Bot. Club* 38: 272, 1911 (Evans 1911). Type:—*Aphanolejeunea microscopica* (Taylor 1836: 59) Evans (1911: 273) ≡ *Cololejeunea* subg. *Aphanolejeunea* (A.Evans.) Benedix, *Feddes Repert. Spec. Nov. Regni Veg. Beih.* 134: 15, 1953 (Benedix 1953) *nom. inval.* (ICN 41.5; basionym not cited).

***Cololejeunea cardiocarpa* (Mont.) A.Evans, *Mem. Torrey Bot. Club* 8: 172, 1902 (Evans 1902).**

Basionym:—*Lejeunea cardiocarpa* Mont., *Hist. Phys. Cuba*: 476, 1842 (Montagne 1842). Type:—CUBA. “Ad folia *Calophylli Calabae* repentem in Cuba insula legerunt hanc speciem clarr. *Ramon de la Sagra et Auber*” (PC-Mont., syntype)
= *Cololejeunea cardiocarpioides* Tixier, *Trop. Bryol.* 11: 38, 1995 (Tixier 1995a), *syn. nov.* Type:—RWANDA. Cyangugu: Nyungwe forest, Uwinka Station, epiphyllous in submontane forest, 2000 m., 14 August 1991, *E. Fischer 8516/108* (G-00113772, holotype).

***Cololejeunea lanciloba* Steph., *Hedwigia* 34: 250, 1895 (Stephani 1895).**

Type:—INDIA. Nicobar is.: Katschall, 1875, *W.S. Kurz 3917* [*Stephani herb. 3718*] (G-00128045, lectotype **here designated** [based on Thiers’ annotation 1986.04.01]). ≡ *Leptocolea lanciloba* (Steph.) A.Evans, *Bull. Torrey Bot. Club* 38: 268, 1911 (Evans 1911).
= *Cololejeunea kamchayana* Tixier, *Bryophyt. Bibl.* 27: 151, 1985 (Tixier (1985), *syn. nov.* Type:—CAMBODIA. Mt. Bokor, 800 m, *P. Tixier 3563* (PC, holotype).
= *Cololejeunea evansii* Tixier, *Cryptog. Bryol. Lichénol.* 16: 229, 1995 (Tixier 1995b), *syn. nov.* Type:—PUERTO RICO. Mayagüez, *A.A. Heller s.n.* sub nom. *Leptocolea planifolia* (YU, holotype).

***Cololejeunea obliqua* (Nees et Mont.) Schiffn., *Bot. Jahrb. Syst.* 23: 586, 1897 (Schiffner 1897).**

Basionym:—*Lejeunea obliqua* Nees et Mont., *Ann. Sci. Nat. Bot. (ser. 2)* 19: 264, 1843 (Montagne 1843). Type:—FRENCH GUIANA. Cayenne, *F. Leprieur* (PC 3280, 3591, 3588). Note:—Tixier (ms.) could not find any type material in PC.
= *Cololejeunea pseudo-obliqua* Tixier, *Trop. Bryol.* 11: 59, 1995 (Tixier 1995a), *syn. nov.* Type:—RWANDA: Nyungwe Nat. Park, Kamiranzovu., 2000 m., 13 Aug 1991, *E. Fischer 6223 p.p.* (G-00113769, holotype).
= *Physocolea semidentata* Steph., *Sp. Hepat. (Stephani)* 5: 883, 1916 (Stephani 1916), *syn. nov.* Type:—COSTA RICA. Bois de la vallée de Tuis, bassin du Reventarzon, September 1893, *A. Tonduz*, herb Cardot. n. 15591 (G-00069367, lectotype **here designated** [or possibly holotype, cf. McNeill 2014]). Note:—M.I. Morales annotated the type specimen as belonging to *Cololejeunea obliqua*, but the synonym seems never to have been published.

***Cololejeunea obtusifolia* (E.W.Jones) Tixier, *Trop. Bryol.* 11: 42, 1995 (Tixier 1995a).**

Basionym:—*Cololejeunea pusilla* var. *obtusifolia* E.W.Jones, *Trans. Brit. Bryol. Soc.* 2: 427, 1954 (Jones 1954). Type:—NIGERIA. Benin: Sapoba, 1 February 1948, *E.W. Jones 163* (E, lectotype designated by Tixier 1995a)
= *Cololejeunea heterolobula* Tixier, *Trop. Bryol.* 11: 40, 1995 (Tixier 1995a), *syn. nov.* Type:—RWANDA, Cyangugu: Forêt de Ngyungwé, Kamiranzovu, 2000 m, 13 August 1991, *E. Fischer 6223/18* (G-00113771, holotype).
= *Cololejeunea pseudopusilla* Tixier, *Trop. Bryol.* 11: 50, 1995 (Tixier 1995a) “*pseudo-pusilla*”, *syn. nov.* Type:—D. R. CONGO. Kivu: Mont Kahuzi, près de la route Bukawu-Irangi, 1900 m, *E. Fischer 8515/36* (G-00113768!, holotype).
= *Cololejeunea sphaerocarpa* Tixier, *Trop. Bryol.* 11: 42, 1995 (Tixier 1995a), *syn. nov.* Type:—D. R. CONGO. Kivu, station forestière d’Irangi, au S.W. Du Mt. Ilimo, 1300 m, 23 August 1991, *E. Fischer 8511/4* (G-00113767, holotype).

Cololejeunea obtusifolia* var. *madecassa* (Tixier) Pócs, *comb. nov.

Basionym:—*Cololejeunea androphylla* E.W.Jones var. *madecassa* Tixier, *Bull. Trimestriel Acad. Malgache, n.s.* 55: 216, 1977 [1979] (Tixier 1977). Type:—MADAGASCAR. Antananarivo, Mandialaza, 1200 m, 19 December 1975, *P. Tixier 7670* (PC).

***Cololejeunea planissima* (Mitt.) Abeyw., *Ceylon J. Sci., Biol. Sci.* 2 (1): 73, 1959 (Abeywickrama 1959).**

Basionym:—*Lejeunea planissima* Mitt., *J. Proc. Linn. Soc., Bot.* 5: 117, 1861 [1860] (Mitten 1861). Type:—SRI LANKA. Pt. Galle, *G. Gardner* 1393 (NY).
= *Cololejeunea planifolia* (A.Evans) R.M.Schust., *Beih. Nova Hedwigia* 9: 177, 1963 (Schuster 1963a), *syn. nov.* Basionym:—*Leptocolea*

planifolia A. Evans, *Bull. Torrey Bot. Club* 38: 265, 1911 (Evans 1911). Type:—PUERTO RICO. Utuado, *E.G. Britton & D.W. Marble* 882 p.p. (NY, holotype).

Cololejeunea stylilobula* Tixier ex R.L. Zhu, *sp. nov.

Based on:—*Cololejeunea stylilobula* Tixier, *Bryophyt. Bibl.* 27: 119, 1985 (Tixier 1985), *nom. inval.* (ICN Art. 40.1; no type indicated). Type:—VIETNAM. Ninh-Binh, parc national de Cuc Phuong, vers Mén, 400 m, 20 December 1965, *T. Pócs & Nguyễn Ngọc Bích* 3028 (PC!, holotype). Note:—When Tixier (1985) described *Cololejeunea stylilobula* he did not indicate any type. A type is here selected in order to validate the name. The description in Tixier (1985: 119) with the addition of the holotype information here validates the taxon.

***Cololejeunea trichomanis* (Gottsche) Steph., *Hedwigia* 34: 252, 1895 (Stephani 1895).**

Basionym:—*Lejeunea trichomanis* Gottsche, *Abh. Naturwiss. Vereins Bremen* 7: 362, 1882 (Gottsche 1882). Type:—AUSTRALIA. Queensland: Bellenden Ker Range, 1881, *H. Karsten* [Stephani herbarium no. 17352] (G-00115296, lectotype designated by Thiers 1988; MEL, isolectotype).
= *Cololejeunea dalatensis* Tixier, *Bryophyt. Bibl.* 27: 197, 1985 (Tixier 1985), *syn. nov.* Type:—VIETNAM. Tuyen Duc, Dalat, Mt. Lang Bian, 1900 m, 10 December 1958, *P. Tixier* 2297 (PC-104218, holotype).
= *Cololejeunea tixieriana* M.Dey, D.Singh et D.K.Singh, *Taiwania* 53 (3): 258, 2008 (Dey *et al.* 2008), *syn. nov.* Type:—INDIA. West Bengal: Darjeeling district, Rangî Rum, Bhutan road, ca 1750 m, 19 December 2004, *K.P. Singh*, 36397A (CAL, holotype).

***Cololejeunea vidaliana* Tixier, *Nat. Hist. Bull. Siam Soc.* 24 (3/4): 444, 1973 (Tixier 1973).**

Type:—LAOS. near Paksong (Bolovents), corticolous in clear forest, 29 December 1968, *P. Tixier* 4139 (PC, holotype).
= *Cololejeunea papulosa* Tixier, *Ann. Fac. Sci. Univ. Phnom Penh* 1: 58, 1967 [1968] (Tixier 1967), *nom. inval.* (ICN Art. 40.2; based on more than one gathering). ≡ *Cololejeunea papulosa* Tixier, *Bryophyt. Bibl.* 27: 41, 1985 (Tixier 1985) *nom. illeg.* (ICN Art. 53.1; non R.M.Schust. 1980), *syn. nov.* Type:—VIETNAM. Lam Đông, forêt de la Dalao, épiphyllous, 950 m, 1960, *P. Tixier* 251 (PC, holotype). Blocking name:—*Cololejeunea papulosa* R.M.Schust., *Phytologia* 45 (5): 433, 1980 (Schuster 1980).

***Cololejeunea zenkeri* (Steph.) E.W.Jones, *Trans. Brit. Bryol. Soc.* 2: 420, 1954 (Jones 1954).**

Basionym:—*Aphanolejeunea zenkeri* Steph., *Sp. Hepat. (Stephani)* 5: 858, 1916 (Stephani 1916). Type:—CAMEROON. s.loc., *J.C. Zenker* 1274a (G-00045059, lectotype **here designated**).
= *Cololejeunea duvignaudii* E.W.Jones, *Trans. Brit. Bryol. Soc.* 2: 418, 1954 (Jones 1954), *syn. nov.* Type:—D. R. CONGO, Panzi (sous-bois), *P. Duvignaud* 998c (BR-5040032317160!, holotype).
= *Cololejeunea duvignaudii* var. *papillata* Tixier, *Bull. Trimestriel Acad. Malgache, n.s.* 55: 223 1977 [1979] (Tixier 1977), *syn. nov.* Type:—MADAGASCAR. Antananarivo: Manjakatempo, 1700 m, *R. Benoist s.n.* (PC, holotype).

***Nephelolejeunea* Grolle, *J. Hattori Bot. Lab.* 37: 252, 1973 (Grolle 1973).**

Type:—*Nephelolejeunea talinayi* (S.W.Arnell) Grolle.
= *Siphonolejeunea* subg. *Austrolejeunea* R.M.Schust., *Beih. Nova Hedwigia* 9: 187, 1963 (Schuster 1963a), *nom. inval.* (ICN Art. 39.1; no Latin description). Type:—*Siphonolejeunea olgae* R.M.Schust., *Beih. Nova Hedwigia* 9: 187, 1963 (Schuster 1963b). ≡ *Austrolejeunea* (R.M.Schust.) R.M.Schust., *J. Hattori Bot. Lab.* 26: 244, 1963 (Schuster 1963b), *nom. inval.* (ICN Art. 41.1; basionym not valid).

Nephelolejeunea bidentata* B.M.Thiers ex L.Söderstr. et Hagborg, *sp. nov.

Based on:—*Austrolejeunea bidentata* B.M.Thiers, *Bryologist* 88: 350, 1985 [1986] (Thiers 1985), *nom. inval.* (ICN Art. 35.1; genus not valid). Type:—AUSTRALIA. New South Wales. Clyde Mt, Braidwood-Bateman's Bay Rd., 9 August 1984, *B. Thiers* 2938 (AD, holotype; NY, CBG, isotypes). Note:—The reference to the description in Thiers (1985: 350) validates the taxon.

Nephelolejeunea fragilis* (R.M.Schust.) L.Söderstr. et A.Hagborg, *comb. nov.

Basionym:—*Cololejeunea fragilis* R.M.Schust., *Phytologia* 56: 458, 1985 (Schuster 1985). Type:—NEW ZEALAND. South Island:

Waterfall Track, W. of Lewis Pass, Lewis Pass Reserve, *R.M. Schuster 84-1699d* (F, holotype). ≡ *Austrolejeunea fragilis* (R.M.Schust.) R.M.Schust., *J. Hattori Bot. Lab.* 72: 191, 1992 (Schuster 1992), *nom. inval.* (ICN Art. 35.1; genus not valid).

Nephelolejeunea hispida* R.M.Schust. ex L.Söderstr. et A.Hagborg, *sp. nov.

Based on:—*Austrolejeunea hispida* R.M.Schust., *Phytologia* 47: 305, 1981 (Schuster 1981), *nom. inval.* (ICN Art. 35.1; genus not valid).
Type:—NEW ZEALAND. South Island: Falls Creek, Upper Hollyford R. valley, 3 November 1961, *R.M. Schuster 48809* (F, holotype). Note:—The reference to the description in Schuster (1981: 305) validates the taxon.

Nephelolejeunea jarmaniana* Grolle ex L.Söderstr. et A.Hagborg, *sp. nov.

Based on:—*Austrolejeunea jarmaniana* Grolle, *Nova Hedwigia* 55: 112, 1992 (Grolle 1992), *nom. inval.* (ICN Art. 35.1; genus not valid).
Type:—AUSTRALIA. Tasmania: near the southern end of Romney Marsh, *J. Jarman 90/4* (JE-04002945, holotype; Hb. Jarman, isotype). Note:—The reference to the description in Grolle (1992: 112) validates the taxon.

Nephelolejeunea nudipes* (Hook. f. et Taylor) L.Söderstr. et A.Hagborg, *comb. nov.

Basionym:—*Jungermannia nudipes* Hook.f. et Taylor, *London J. Bot.* 3: 568, 1844 (Hooker & Taylor 1844). Type:—NEW ZEALAND. 1843, *J.D. Hooker* (S-B13523, S-B13524, isotypes). ≡ *Austrolejeunea nudipes* (Hook.f. et Taylor) Grolle, *J. Hattori Bot. Lab.* 37: 257, 1973 (Grolle 1973), *nom. inval.* (ICN Art. 35.1; genus not valid).
= *Siphonolejeunea olgae* R.M.Schust., *Beih. Nova Hedwigia* 9: 187, 1963 (Schuster 1963a). Type:—NEW ZEALAND. Otago, Table Hill Reservation, *R.M. Schuster 48581* (F!). ≡ *Austrolejeunea olgae* (R.M.Schust.) R.M.Schust., *J. Hattori Bot. Lab.* 26: 244, 1963 (Schuster 1963b), *nom. inval.* (ICN Art. 35.1; genus not valid).

Nephelolejeunea occidentalis* Pócs ex L.Söderstr. et A.Hagborg, *sp. nov.

Based on:—*Austrolejeunea occidentalis* Pócs, *J. Hattori Bot. Lab.* 99: 187, 2006 (Pócs 2006), *nom. inval.* (ICN Art. 35.1; genus not valid).
Type:—AUSTRALIA. Western Australia: Denmark Shire, Gigant Forest Block, 16 June 2000, *B.G. Hammersley 2498* (PERTH!), holotype). Note:—The reference to the description in Pócs (2006: 187) validates the taxon.

Nephelolejeunea radulifolia* (C.Massal.) L.Söderstr. et A.Hagborg, *comb. nov.

Basionym:—*Lejeunea radulifolia* C.Massal., *Nuovo Giorn. Bot. Ital.* 17 (3): 248, 1885 (Massalongo 1885), “*radulaefolia*”. Type:—ARGENTINA. Tierra del Fuego: I. de los Estados, *C. Spegazzini* (VER, G). ≡ *Austrolejeunea radulifolia* (C.Massal.) R.M.Schust., *J. Hattori Bot. Lab.* 26: 244, 1963 (Schuster 1963b), “*radulaefolia*”, *nom. inval.* (ICN Art. 53.1; genus not valid).

Nephelolejeunea secunda* M.A.M.Renner ex L.Söderstr. et A.Hagborg, *sp. nov.

Based on:—*Austrolejeunea secunda* M.A.M.Renner, *Bryologist* 113 (4): 782, 2010 (Renner 2010), *nom. inval.* (ICN Art. 53.1; genus not valid). Type:—NEW ZEALAND. North Island: Ruahine Range, Armstrong Saddle above Sunshine Hut, 17 October 2009, *M.A.M. Renner et al. 4453* (AK, holotype; CHR, isotype). Note:—The reference to the description in Renner (2010: 782) validates the taxon.

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