



Notes on Early Land Plants Today. 32. New synonyms in *Andrewsianthus* and a transfer to *Tritomaria* (Lophoziaceae, Marchantiophyta)

JIŘÍ VÁŇA^{1,4}, LARS SÖDERSTRÖM², ANDERS HAGBORG³ & MATT VON KONRAT³

¹Department of Botany, Charles University, Benátska 2, Cz-12801 Praha 2, Czech Republic; vana@natur.cuni.cz

²Department of Biology, Norwegian University of Science and Technology, N-7491 Trondheim, Norway; lars.soderstrom@bio.ntnu.no

³Department of Botany, The Field Museum, 1400 South Lake Shore Drive, Chicago, IL 60605–2496, USA; hagborg@pobox.com, mvonkonrat@fieldmuseum.org

⁴Author for correspondence

Andrewsianthus Schuster (1961: 66) is a heterogeneous complex. Most taxa have bilobed leaves, but there are also taxa with trilobed leaves [*Andrewsianthus ferrugineus* Grolle (1966: 275) and sometimes also *Andrewsianthus sundaicus* (Schiffner 1898: 202) Schuster 1969: 710] and unlobed leaves [*Andrewsianthus cavifolius* Váňa (1974: 640), *Andrewsianthus mizutanii* Kitagawa (1969: 307) and *Andrewsianthus zantenii* Váňa (1974: 645)].

Studies by the senior author of many specimens of *Andrewsianthus ferrugineus* from Himalaya collected by D.G. Long show that it falls well within the description of *Tritomaria*. Terminal branching of *Frullania*-type, and the presence of stem cortex with thick-walled cells in *Andrewsianthus ferrugineus* are characteristics it shares with *Tritomaria*. They are unknown in *Andrewsianthus*. The only known difference is the additional presence of *Anomoclada*-type of branching. Thus, we here transfer it to *Tritomaria*. In addition, Schuster (2002) placed this species in his monotypic *Andrewsianthus* subg. *Pseudotritomaria* (= subg. *Tritomariopsis* *nom. inval.*), which should be reduced to synonymy with *Tritomaria*.

Andrewsianthus marionensis is based on *Lophozia marionensis*, but the first description (as *Cephaloziella marionensis*) of this species is one year older (see Grolle 2002). This species is very variable and has been described under four (five, if we count two descriptions under the specific epithet “*marionensis*”) different names from various geographical areas. Váňa (1985: 97) synonymized *Lophozia squarrosa* (= *Andrewsianthus squarrosus*), described from Tristan da Cunha, with *Andrewsianthus marionensis* and suggested that *Andrewsianthus marionensis* probably is conspecific with *Cephalolobus squarrosus* without having seen the type. A similar opinion can also be found in Schuster (2002) stating “New Zealand, Tristan?” in reference to *Andrewsianthus cuspidatus* and the statement that *Lophozia squarrosa* of Tristan da Cunha “appears to be very closely allied, if not identical, with ... *A. cuspidatus* R.M. Schust.”. The identity of *Andrewsianthus marionensis* (= *Andrewsianthus squarrosus*) and *Andrewsianthus cuspidatus* was confirmed by the senior author based on material from New Zealand, Kerguelen Is. and Prince Edward Is.

In contrast to the above, Engel & Glenny (2008: 691) recently adopted a very narrow taxon concept, writing about *Andrewsianthus cuspidatus*: “The species appears to be a close ally of *Andrewsianthus marionensis* (S.W.Arnell) Grolle (Typus: Marion Island) = *Andrewsianthus squarrosus* (S.W.Arnell) Grolle = *Lophozia squarrosa* S.W.Arnell (Typus: Tristan da Cunha) ... We would prefer to recognize two distinct species – *Andrewsianthus marionensis* from Marion Island and Tristan da Cunha, and *Andrewsianthus cuspidatus* from New Zealand”. This view was, in part, based on Schuster’s (2002) use of material (*Schuster* 67-460), previously referred to *Andrewsianthus confusus* (see later), for his drawing of *Andrewsianthus cuspidatus*.

Engel (1972) also described South American populations of *Andrewsianthus marionensis* as *Andrewsianthus australis*, because they were different from *Andrewsianthus achrous* (Spruce 1885: 514)

Schuster (1964: 207) [= *Lophonardia jamesonii* (Montagne 1856: 60) L.Söderstr. et Váňa in Söderström *et al.* (2012b: 000)], which was the only known South American species at that time. Some specimens of the populations named by Engel, mostly from Falkland Is., were studied by the senior author. They simply represent optimally developed, mostly robust plants of *Andrewsianthus marionensis* with somewhat squarrose leaves and a papillose (but not coarsely papillose) cell surface, a form which is very rare in the subantarctic islands.

Andrewsianthus perigonalis was first described by Hooker & Taylor (1844) as *Jungermannia perigonalis* and moved to *Sphenolobus* by Berggren (1898). The latter name was used by Stephani (1902). Another more complicated problem was created by Schuster's incorrect and confusing concept of *Andrewsianthus perigonalis*. *Andrewsianthus confusus* was described by Schuster (1963: 279 as *Eremonotus confusus*) referring to Stephani's (1902) Latin diagnosis of *Sphenolobus perigonalis*, excluding the original type of this species and selecting a new type (*Schuster 49581*, from Stewart I.: Pegasus Creek). Like Stephani's description, Hodgson's (1946: 70) description of *Sphenolobus perigonalis* should also, according to Schuster, represent *Andrewsianthus confusus*. Consequently Schuster (1968: 490) mentioned three specimens belonging to *Andrewsianthus confusus*: *Schuster 49581* (type), *Schuster 50002a* (the same locality) and *Schuster 67-460* (Stewart I.: Mt. Brewster). Discussing the opinion of Hodgson (1967: 188), who did not accept Schuster's opinion that *Andrewsianthus confusus* is different from *Sphenolobus* (= *Andrewsianthus perigonalis*), Schuster wrote that in *RMS 67-460* the cuticle is "coarsely, confluent papillose to papillose-striolate". The fact that Schuster (2002: 320-329) did not mention this species in his overview of *Andrewsianthus* and finally that he used his collection (*RMS 67-460*) as one of the sources for a drawing of *Andrewsianthus cuspidatus* (l.c. fig. 335:1-4), was used by Engel & Glenn (2008: 694) as the basis for their assessment that *Andrewsianthus confusus* and *Andrewsianthus cuspidatus* "are probably identical". However, they did not study the type of *Andrewsianthus confusus* (*Schuster 49581*) or the *Schuster 50002a* specimen. Schuster sent duplicates of the type specimen (*Schuster 49581*), as well as *Schuster 50114* from the same locality to Riclef Grolle (specimens now in JE!). Both represent well developed plants of *Andrewsianthus perigonalis*. Based on this, *Eremonotus confusus* (and *Andrewsianthus confusus*) must without doubt be placed in the synonymy of *Andrewsianthus perigonalis*, as already done by Hodgson (1967, as *Lophozia perigonalis*). *Andrewsianthus planifolius*, described from Falkland Is., should also be synonymised with *Andrewsianthus perigonalis*, as already suggested by Schuster (2002: 338).

The fundamental problem in Schuster's studies (1963, 1966, 1968) is that the type specimen of *Jungermannia perigonalis* (= *Andrewsianthus perigonalis*) consists of small, poorly developed male plants that do not agree with larger, typical plants of the same species. Schuster's concept was apparently based only on the comparison of two specimens, *Schuster 49581* and the type of *Jungermannia perigonalis*. Finally, the specimen *RMS 67-460* naturally belongs to *Andrewsianthus marionensis* (= *Andrewsianthus cuspidatus*). The following taxonomic changes summarize this discussion.

Formal treatment

The format of this note follows what is outlined in Söderström *et al.* (2012).

***Tritomaria Schiffn. ex Loeske*, *Hedwigia* 49: 13, 1908 (Loeske 1909).**

Type:—*Tritomaria exsecta* (Schmidel ex Schrad.) Schiffn. ex Loeske.

= *Andrewsianthus* subg. *Pseudotritomaria* R.M.Schust., *Beih. Nova Hedwigia* 119: 323, 2002 (Schuster 2002), **syn. nov.**
≡ *Andrewsianthus* subgen. *Tritomariopsis* R.M.Schust., *Beih. Nova Hedwigia* 119: 320, 2002, *nom. inval.* (Art. 32.1.1.d; no description).

***Tritomaria ferruginea* (Grolle) Váňa, comb. nov.**

Basionym:—*Andrewsianthus ferrugineus* Grolle, *Khumbu Himal*: 275, 1966 (Grolle 1966).

Type:—NEPAL. Vorhimalaya, westlich unter Rauje gegen Ringmo, 4000 m, 1962, *Poelt, Nr. H 200* (holotype M!, isotypes JE!, NICH!, F).

***Andrewsianthus marionensis* (S.W.Arnell) Grolle, Bakker, Winterbottom & Dyer, *Marion Prince Edw. Is*: 232, 1971 (Grolle (1971)).**

Basionym:—*Lophozia marionensis* S.W.Arnell, *Svensk Bot. Tidskr.* 47: 421, 1953 (Arnell 1953).

Type:—MARION I. Ridges between Transvaal Cove and Trypot Beach, 6.3.1952, *R. W. Rand 3575* (holotype BOL!).

= *Cephaloziella marionensis* S.W.Arnell, *Bot. Notiser* 105: 327, 1952 (Arnell 1952), syn. fide Grolle 2002. Type:—MARION I. February 1948, *Commander Copenhagen* (holotype BOL-23884!).

= *Lophozia squarrosa* S.W.Arnell, *Results Norweg. Sci. Exped. Tristan da Cunha* 42: 20, 1958 (Arnell 1958), syn. fide Váňa (1985). Lectotype (Váňa 1985):—TRISTAN DA CUNHA. Above Burntwood, 1200 m, 8 January 1938, *E. Christorphersen et Y. Mejland 805*, (O!) ≡ *Andrewsianthus squarrosus* (S.W.Arnell) Grolle, Bakker, Winterbottom & Dyer, *Marion Prince Edw. Is*: 232, 1971 (Grolle 1971).

= *Cephalobus squarrosus* R.M.Schust., *Rev. Bryol. Lichénol.* 34: 256, 1966 (Schuster 1966) **syn. nov.** Type:—NEW ZEALAND. Mt. Cook Nat. Park, Sealy Range below Sealy Lakes, 4000 ft., *R. M. Schuster 49713* (holotype, F) ≡ *Andrewsianthus squarrosus* (R.M.Schust.) R.M.Schust., *Beih. Nova Hedwigia* 119: 331, 2002 (Schuster 2002), *nom. inval.* (Art. 33.4; basionym not cited) ≡ *Andrewsianthus cuspidatus* R.M.Schust., *Beih. Nova Hedwigia* 119: 324, 328, 329, 330, 331, 2002 (Schuster 2002), *nom. inval.* (Art. 33.4; replaced name not fully cited)

= *Andrewsianthus australis* J.J.Engel, *Bryologist* 75: 328, 1972 (Engel 1972) **syn. nov.** (ex descriptions, illustrations and specimens in herbarium F). Type:—CHILE. Prov. Magallanes: Caleta Amalia, 1 October 1969, *J.J. Engel 5411A* (MSC).

***Andrewsianthus perigonalis* (Hook.f. et Taylor) R.M.Schust., *Beih. Nova Hedwigia* 119: 336, 2002 (Schuster 2002).**

Basionym:—*Jungermannia perigonalis* Hook. et Taylor, *London J. Bot.* 3: 368, 1844 (Hooker & Taylor 1844).

Type:—NEW ZEALAND. Campbell I.: Voy. of H.M.S. Erebus & Terror (holotype NY).

≡ *Sphenolobus perigonalis* (Hook.f. et Taylor) Berggr., *New Zealand Hepat.*: 22, 1898 (Berggren 1898). ≡ *Lophozia perigonalis* (Hook.f. et Taylor) Grolle, *Rev. Bryol. Lichénol.* 31, 1962 [1963] (Grolle 1963).

= *Eremonotus confusus* R.M.Schust., *J. Hattori Bot. Lab.* 26: 279, 1963 (Schuster 1963), syn. fide Hodgson (1967). Type:—NEW ZEALAND. Stewart Island: Pegasus Creek, 0.8-1.5 mi above Port Pegasus, *Schuster 49581* (holotype F, isotype JE!) ≡ *Andrewsianthus confusus* (R.M.Schust.) R.M.Schust., *Nova Hedwigia* 15: 490, 1968 (Schuster 1968).

= *Andrewsianthus planifolius* J.J.Engel, *Bryologist* 75: 332, 1972 (Engel 1972), syn. fide Schuster (2002).

Acknowledgement

The Early Land Plants Today project (ELPT) has been generously supported in part by the Global Biological Information Facility (GBIF) Seed Money Award No.2007-41, activities facilitated in part by funding from the Biodiversity Synthesis Center of the Encyclopedia of Life (BioSynC), partial funding from the National Science Foundation (Award No's 0749762, 1115002), the Warwick Foundation, and the Negaunee Foundation.

References

Arnell, S. (1952) Hepaticae collected in South and West Africa 1951. *Botaniska Notiser* 105: 307–319.

Arnell, S. (1953) List of Hepaticae collected in Marion Island by Mr. R. W. Rand Dec. 1951–April 1952. *Svensk Botanisk Tidskrift* 47: 411–425.

- Arnell, S. (1958) Hepatics from Tristan da Cunha. *Results of the Norwegian Scientific Expedition to Tristan da Cunha, 1937–1938* 42: 1–76.
- Berggren, S. (1898) *On New Zealand Hepaticae*. I. E. Malmström, Lund, 48 pp.
- Engel, J.J. (1972) The genus *Andrewsianthus* in South America and the Falkland Islands. *Bryologist* 75: 325–334. <http://dx.doi.org/10.2307/3241470>
- Engel, J.J. & Glenny, D. (2008) *A flora of the liverworts and hornworts of New Zealand, Volume 1*. Missouri Botanical Garden, St. Louis.
- Grolle, R. (1963 “1962”) Eine bemerkenswerte neue *Lophozia* aus Neuseeland. *Revue Bryologique et Lichénologique* 31: 152–156.
- Grolle, R. (1966) Die Lebermoose Nepals. *Ergebnisse des Forschungs-Unternehmens Nepal Himalaya* 1: 262–298. http://dx.doi.org/10.1007/978-3-642-92914-4_5
- Grolle, R. (1971) Hepaticopsida. In: van Zinderen Bakker, E.M., Winterbottom, J.M. & Dyer, R.A. (Eds.), *Marion and Prince Edward Islands. Report on the South African Biological and Geological Expedition 1965–1966*. A. A. Balkema, Cape Town, pp. 228–236.
- Grolle, R. (2002) The Hepaticae and Anthocerotae of the subantarctic and temperate islands in the eastern Southern Hemisphere (90°E to 0°): an annotated catalogue. *Journal of Bryology* 24: 57–80. <http://dx.doi.org/10.1179/037366802125000359>
- Hodgson, E.A. (1946) New Zealand Hepaticae (Liverworts). V. The family Jungermanniaceae. *Transactions and Proceedings of the Royal Society of New Zealand* 76: 68–86.
- Hodgson, E.A. (1967) New Zealand Hepaticae (Liverworts)—XVII A miscellany of taxonomic notes. Part. 2. *Transactions of the Royal Society of New Zealand, Botany* 3: 175–198.
- Hooker, J.D. & Taylor, T. (1844) Hepaticae Antarcticae; being characters and brief descriptions of the Hepaticae discovered in the southern circumpolar regions during the voyage of H.M. Discovery ships Erebus and Terror. I. species of Lord Auckland's and Campbell's Islands. *London Journal of Botany* 3: 366–400.
- Kitagawa, N. (1969) A new species of *Andrewsianthus* from North Borneo. *Journal of the Hattori Botanical Laboratory* 32: 307–310.
- Loeske, L. (1909) Zur Moosflora der Zillertaler Alpen. *Hedwigia* 49: 1–53.
- Montagne, J.F.C. (1856) *Sylloge generum specierumque cryptogamarum quas in varii operibus descriptas iconibusque illustratas, nunc ad diagnosum reductas, non nullasque novas interjectas ordine systematico disposuit*. Sumptibus J.-B. Ballière, Paris, 498 pp. <http://dx.doi.org/10.5962/bhl.title.5403>
- Schiffner, V. (1898) Expositio plantarum in itinere suo Indico annis 1893–1894 suscepto collectarum I. *Denkschriften der Kaiserlichen Akademie der Wissenschaften, Wien. Mathematisch-Naturwissenschaftliche Klasse* 67: 153–203.
- Schuster, R.M. (1961) Studies in Lophoziaceae. 1. The genera *Anastrophyllum* and *Sphenolobus* and their segregates. *Revue Bryologique et Lichénologique* 30: 55–73.
- Schuster, R.M. (1963) Studies on antipodal Hepaticae I. Annotated key to the genera of antipodal Hepaticae with special reference to New Zealand and Tasmania. *Journal of the Hattori Botanical Laboratory* 26: 185–309.
- Schuster, R.M. (1964) Studies on Hepaticae XIX–XX. *Cephalozia* (Spr.) Schiffn. and *Andrewsianthus* Schust. *Nova Hedwigia* 8: 201–209.
- Schuster, R.M. (1966) Studies in Lophoziaceae. 1. The genera *Anastrophyllum* and *Sphenolobus* and their segregates. 2. *Cephalolobus* gen. n., *Acrolophozia* gen. n. and *Protomarsupella* gen. n. *Revue Bryologique et Lichénologique* 34: 241–287.
- Schuster, R.M. (1968) Studies on the Hepaticae, XXIX–XLIV. A miscellany of new taxa and new range extensions. *Nova Hedwigia* 15: 437–529.
- Schuster, R.M. (1969) *The Hepaticae and Anthocerotae of North America. vol. II*. Columbia University Press, New York, 1062 pp.
- Schuster, R.M. (2002) Austral Hepaticae, part II. *Beihefte zur Nova Hedwigia* 119: 1–606.
- Söderström, L., Hagborg, A. & von Konrat, M. (2012a) Notes on Early Land Plants Today. *Phytotaxa* 65: 41–42.
- Söderström, L., Váňa, J., Hagborg, A. & von Konrat, M. (2012b) Notes on Early Land Plants Today. 31. *Lophonardia* replaces *Hypolophozia*. *Phytotaxa* 81 (1): 19–21.
- Spruce, R. (1885) Hepaticae Amazonica et Andinae. *Transactions and Proceedings of the Botanical Society. Edinburgh* 15: 309–588.
- Stephani, F. (1902) Species Hepaticarum 2. *Bulletin de l'Herbier Boissier, série 2* 2: 157–179.
- Váňa, J. (1974) Lebermoose aus Neuguinea. 11. *Andrewsianthus*. *Journal of the Hattori Botanical Laboratory* 38: 639–649.
- Váňa, J. (1985) Notes on Some African Hepatic Genera 6–9. *Folia Geobotanica et Phytotaxonomica* 20: 81–99.