



Notes on Early Land Plants Today. 35. Notes on Lophoziaceae (Marchantiophyta)

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Abstract

Recent redefinition of Lophoziaceae has led to many nomenclature and taxonomic changes but several problems remains. Here we discuss and make the necessary new combinations for *Lophoziopsis longidens* subsp. *arctica*, *Lophoziopsis pellucida* var. *minor*, *Heterogemma patagonica* and *Trilophozia quinquedentata* var. *asymetrica*. A number of new synonyms are proposed. *Lophozia handelii* is shown to be a synonym to *Lophozia pallida* and the species is treated separate from *Lophozia guttulata*. Four problematic names in *Lophozia* (*Lophozia groenlandica*, *Lophozia murmanica*, *Lophozia confertifolia* and *Lophozia longiflora*) are discussed and a conspectus of the genus is given.

Introduction

The definition of Lophoziaceae Cavers (1910: 293) as a family has changed dramatically in recent years based on molecular studies. Schill *et al.* (2004) included the whole family as defined by Schuster (1969) in Scapaniaceae Migula (1904: 479). De Roo *et al.* (2007) showed that it included several unrelated groups. It has later been separated into Anastrophyllaceae Söderström *et al.* (2010: 48), Scapaniaceae, Jamesoniellaceae He-Nygrén *et al.* (2006: 27) and Lophoziaceae, as well as moving *Leiocolea* (Müller 1913: 711) Buch (1933: 288) to Jungermanniaceae Reichenbach (1828). Even so, the family still includes elements that should be removed.

The genus *Lophozia* (Dumortier 1831: 53) Dumortier (1835: 17) as defined by Schuster (1969) is also shown to be very heterogeneous and the species belong to at least 4 families (De Roo *et al.* 2007). The break-up of the genus has resulted in several new names and combinations (Söderström *et al.* 2010, Konstantinova & Vilnet 2010) but a few taxa remain to be transferred or synonymized.

The format of this note follows Söderström *et al.* (2012) except that we use the Melbourne International Code of Nomenclature for algae, fungi, and plants (ICN; McNeill *et al.* 2012) instead of the Vienna International Botanical Code of Nomenclature (ICBN; McNeill *et al.* 2006).

New combinations and new synonyms in *Lophoziopsis* Konstant. et Vilnet

Lophoziopsis Konstantinova & Vilnet (2010: 66) was established for the majority of the *Lophozia* s.lat. with red gemmae. However, a few taxa remain to be transferred.

Lophozia nepalensis was described by Bakalin (2003: 50) from Nepal based on a specimen collected by Josef Poelt in 1962. The characters separating it from *Lophoziopsis longidens* were 1) acute-lobed leaves with angulate sinus vs. more or less hornlike lobes and U-shaped sinus, 2) concentration of gemmae (purple, not

red-brown) in apical leaves, not on lobe tips, 3) funnel-like base of the leaves, which are loosely canaliculate-conduplicate vs. almost transversely inserted and decurved in *Lophozia longidens*, and 4) presence of attenuate shoot apices. One of us (JV) could examine rich material from Himalaya collected by David Long and found 2-3 specimens with more or less attenuate shoot apices. Of the characters given by Bakalin, character 1 (acute-lobed leaves) and 3 (funnel-like leaf bases) are of no value as both characters can be found also in some specimens of *Lophozia longidens*, and character 2 (concentration of gemmae) is not constant and mostly refers to attenuate shoot apices. We interpret *Lophozia nepalensis* as a modification of *Lophozia longidens* with attenuate apices induced by ecological conditions.

Lophozia excisa (Dicks.) Konstant. et Vilnet, *Arctoa* 18: 66, 2009 [2010] (Konstantinova & Vilnet 2010).

Basionym:—*Jungermannia excisa* Dicks., *Fasc. Pl. Crypt. Brit.* 3: 11, 1793 (Dickson 1793).

= *Lophozia excisa* var. *gemicumulata* Bakalin, *Monogr. Lophozia*: 99, 2005 (Bakalin 2005), **syn. nov.** Type:—GERMANY. Sachsen: Vogtland, zwischen Schneckenstein und Winselburg. 11 August 1917, M. Spindler. Schiffner, *Hepaticae europaeae* N. 1398 (holotype KPABG). ≡ *Lophozia cylindracea* var. *gemicumulata* Spindl. ex Schiffn., *Krit. Bemerk. Eur. Lebermoose* 28: 29, 1942 (Schiffner 1942), *nom. inval.* (ICN Art. 39.1; no Latin description).

Lophozia longidens (Lindb.) Konstant. et Vilnet, *Arctoa* 18: 66, 2009 [2010] (Konstantinova & Vilnet 2010).

Basionym:—*Jungermannia longidens* Lindb., *Helsingfors Dagblad* 1876 (323): 2 (Lindberg 1876).

= *Lophozia nepalensis* Bakalin, *Ann. Bot. Fenn.* 40: 50, 2003 (Bakalin 2003), **syn. nov.** Type:—NEPAL. East Nepal: Vorhimalaya, *Abies-Rhododendron* forest, on decaying wood, 1962 Poelt H214, (holotype JE!).

Lophozia longidens subsp. ***arctica*** (R.M.Schust.) Váňa et L.Söderstr., *comb. nov.*

Basionym:—*Lophozia longidens* subsp. *arctica* R.M.Schust., *Hepat. Anthocerotae N. Amer.* 2: 539, 1969 (Schuster 1969).

Type:—GREENLAND. Kânâk, Red Cliff Peninsula, NW. Greenland, in deep, vertical dry cleft formation bedrock by ice action, plateau between coastal hills and ice cap, 1500-1600 feet, 4 miles northwest of village, *Schuster RMS 45649* (holotype F-2142374).

≡ *Lophozia longidens* var. *arctica* (R.M.Schust.) Schljakov, *Petjen. Mchi Sev. SSSR* 3: 108, 1980 (Schljakov 1980).

≡ *Lophozia pellucida* f. *arctica* (R.M.Schust.) Bakalin, *Monogr. Lophozia*: 112 (Bakalin 2005).

≡ *Lophozia rubrigemma* f. *arctica* (R.M.Schust.) Bakalin, *Arctoa* 18: 38, 2009 [2010] (Konstantinova *et al.* 2010).

Lophozia pellucida var. ***minor*** (R.M.Schust.) L.Söderstr. et Váňa, *comb. nov.*

Basionym:—*Lophozia pellucida* var. *minor* R.M.Schust., *Canad. J. Bot.* 39: 984, 1961 (Schuster 1961c).

Type:—CANADA. Nunavut: Damp, weakly basic steep slope, south end of Hilgar Bay, 82°26'N, 63°25'W, northeast Ellesmere I, *Schuster RMS 35237* (holotype F).

The identity of *Lophozia patagonica*

Lophozia patagonica was described as belonging to sect. *Heterogemma* Jørgensen (1934: 146) but “may likely prove to be a synonym of *Lophozia capitata*” (= *Heterogemma capitata* (Hooker 1816: pl. 80) Konstantinova & Vilnet (2010: 67)) according to Schuster (2002). Although the type lacks gemmae, the placement in *Heterogemma* (Jørg.) Konstantinova & Vilnet (2010: 67) can be confirmed. The dorsal cortical cells are more than 4x longer than wide and leaf cells are large. In addition, Schäfer-Verwimp (1996) found gemmae similar to species in *Heterogemma* in a specimen identified as the current species. He was also able to study living plants from Brazil and discussed its relation to *Heterogemma capitata*. The main difference is the markedly acute leaf lobes in *Heterogemma patagonica* versus the mainly blunt leaf lobes in *Heterogemma capitata*. Interestingly, *Heterogemma patagonica* grows in similar habitats as *Heterogemma laxa* (Lindberg 1875: 539) Konstantinova & Vilnet (2010: 67) from the Northern Hemisphere. *Heterogemma patagonica* is retained as an independent species here pending further research on the relations in *Heterogemma*.

Heterogemma patagonica (Herzog et Grolle) L.Söderstr. et Váňa, *comb. nov.*

Basionym:—*Lophozia patagonica* Herzog et Grolle, *Rev. Bryol. Lichénol.* 28: 343, 1959 [1960] (Grolle 1960).

Type:—CHILE. Osorno: between San Juan de la Costa and Pucatrihue, 800 m, 1958, *Oberdorfer 246* (holotype JE-4001765!).

The identity of *Lophozia handelii*

Lophozia handelii was placed in the synonymy of *Lophozia guttulata* by Bakalin (2003), but not mentioned in his monograph (Bakalin 2005). One of us (JV) has seen rich material of *Lophozia handelii* from Himalaya and it appears to be a well-developed form of *Lophozia guttulata*. However, it is in most cases possible to separate it from the latter and we therefore retain the species pending further studies. *Lophozia pallida* from Yunnan is not much studied, but study of the type shows it to represent large, well developed plants of *Lophozia handelii* over which it has nomenclatural priority.

Lophozia pallida (Steph.) Grolle, *J. Jap. Bot.* 39: 174, 1964 (Grolle 1964).

Basionym:—*Anastrophyllum pallidum* Steph., *Bull. Herb. Boissier ser. 2*, 1: 1131 (*Sp. Hepat.* 2: 114), 1901 (Stephani 1901).

Type:—CHINA. Yunnan: Ma-eul-chan, *Delavay* (lectotype [Bonner 1962: 77] G-53383! [=G-10810!]¹)

= *Lophozia handelii* Herzog, *Symb. Sin.* 5: 14, 1930 (Herzog. 1930), *syn. nov.* Type:—CHINA. Yunnan: 21.VII.1915, *Handel-Mazzetti 1285* (holotype JE!).

Problematic names in *Lophozia*

The genus *Lophozia* s.str. (sensu Konstantinova *et al.* 2010) includes many problematic taxa and has a chaotic nomenclature as a result of different interpretations of types by different authors. Several molecular studies (De Roo *et al.* 2007, Vilnet *et al.* 2010) have also shown that *Lophozia ventricosa* (Dickson 1790: 14) Dumortier (1835: 14), *Lophozia wenzelii* (Nees 1836: 58) Stephani (1902a: 35), *Lophozia schusterana* Schljakov (1975: 320) and *Lophozia austro-sibirica* Bakalin (2003: 49) (and possibly other taxa) form a complex of closely related, if not conspecific, taxa. On this basis Bakalin (2011) questioned if *Lophozia wenzelii* can be separated from *Lophozia ventricosa* at the species level. The type species itself, *Lophozia ventricosa*, has also been interpreted in different ways, and its use has only recently become stabilized. Schljakov (1980) and others considered the type from Britain to be what is now *Lophozia silvicola* Buch (1929: 228), a species with biconcentric oil bodies. This is possibly a correct interpretation, since *Lophozia silvicola* is common in Britain and oil bodies were not studied at the time of description. Thus, Schljakov (1980) used the name *Lophozia ventricosa* for *Lophozia silvicola* and *Lophozia groenlandica* (Nees in Gottsche *et al.* 1844: 114) Macoun (1902: 19) for *Lophozia ventricosa*. Konstantinova *et al.* (1992) argued that *Lophozia groenlandica* should be rejected and used the next available name, *Lophozia confertifolia* Schiffner (1905: 47), for *Lophozia ventricosa*. Grolle & Long (2000) neotypified *Lophozia ventricosa* with a specimen where the oil bodies were known (non biconcentric). Thus, the usage of the names *Lophozia ventricosa* and *Lophozia silvicola* became fixed. Until recently, *Lophozia ventricosa* and *Lophozia silvicola* have often been considered conspecific, sometimes at varietal level. Recent molecular studies (de Roo *et al.* 2007), however, show that *Lophozia silvicola* should be treated as a separate species.

Lophozia groenlandica:—As mentioned above, *Lophozia groenlandica* is a problematic early name, interpreted in different ways. Schuster (1969) used the name for what is now generally known as *Lophozia schusterana*. Schljakov (1980) considered it a synonym of *Lophozia ventricosa* as currently defined and used

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.

the name for it as he considered *Lophozia ventricosa* (as currently defined after neotypification) to be a synonym of *Lophozia silvicola*. Damsholt (1994) selected a lectotype for *L. groenlandica* and considered it to belong to *Lophozia wenzelii*. Schljakov (1998), however, accepted it as a good species, and placed *Lophozia confertifolia* in synonymy of this species, with *Lophozia murmanica* Kaalaas in Bryhn (1906: 34) and *Lophozia heteromorpha* Schuster & Damsholt in Schuster (1969: 507) as possible synonyms (with question mark). This concept (except the synonymy of *Lophozia confertifolia*) was followed by Grolle & Long (2000) without question marks. Meinunger (2002), however, considered *L. groenlandica* a good species, not identical with *Lophozia wenzelii* or *Lophozia confertifolia* and Bakalin (2005, 2011) regarded it a variety of *Lophozia wenzelii*. Konstantinova *et al.* (2010) followed the latter concept and included *Lophozia murmanica* (with a question mark), but not *Lophozia heteromorpha*, keeping the latter as an independent species. Although it is one of the oldest names in the complex, we are not using the name here due to the ambiguity of its interpretation. An unambiguous epitype should be selected.

Lophozia murmanica:—*Lophozia murmanica* has also been interpreted in several ways, especially by Russian authors. Schljakov (1969) and Schljakov (1970) recognized the species but with two different circumscriptions. Later, Schljakov (1980) included his 1969 ‘species’ in *Lophozia savicziae* Schljakov (1973: 299) and his 1970 ‘species’ (including what he considered to be the type) in his *Lophozia groenlandica* (= *Lophozia ventricosa* in the current sense). Schuster (1969) and Grolle & Long (2000) also included it under *Lophozia groenlandica* (excl. *Lophozia ventricosa*) although the concept of Schuster was later referred to *Lophozia schusterana* by Schljakov (1975). Although briefly discussed by Bakalin (2004), *Lophozia murmanica* was not mentioned by Bakalin (2005). In both Schljakov (1980) and Grolle & Long (2000) *Lophozia heteromorpha* was included as a synonym of *Lophozia groenlandica* together with *Lophozia murmanica*.

Lophozia confertifolia:—Another problematic taxon difficult to place is *Lophozia confertifolia*. It has sometimes been regarded close to *Lophozia ventricosa* (e.g. Schljakov 1975) and sometimes close to *Lophozia wenzelii* (e.g. Müller 1954). Konstantinova *et al.* (1992) used the name for the current *Lophozia ventricosa* as it had been used in that way for some times (mainly in Russian literature) as they used *Lophozia ventricosa* for *Lophozia silvicola*. Grolle & Long (2000) presented the opinion of Váňa that this species is not conspecific with *Lophozia wenzelii*, but did not say where it should be placed. Meinunger (2002) considered it a good species separated from *Lophozia wenzelii* by oil-bodies and stem cross section; like Müller (1954) he later (in Meinunger & Schröder 2007) considered *Lophozia confertifolia* a form of *Lophozia wenzelii*. Bakalin (2005) placed it in synonymy of *Lophozia wenzelii* var. *groenlandica* (Nees) Bakalin (2001: 213). A lectotype for *L. confertifolia* that clearly can be referred to a specific taxon should be selected among the many syntypes in various herbaria.

Lophozia longiflora:—The name *Lophozia longiflora* (Nees 1836: 95) Schiffner (1903: 257) has been used for two different taxa during the last 50 years. Pearson (1890) was the first to associate it with *Lophozia ventricosa* (as *Jungermannia ventricosa* var. *longiflora* (Nees) Pearson (1890: 23)). Müller (1954) followed this concept and the taxon was generally considered a variety of *Lophozia ventricosa* until Schljakov (1981) concluded that all syntypes in Nees’ herbarium belong to *Lophozia guttulata* over which it has nomenclatural priority. The latter concept has generally been followed since then. Meinunger (in Meinunger & Schröder 2007), however, disagreed with Schljakov (1981) after examination of type material from UPS and STR and kept *Lophozia longiflora* and *Lophozia guttulata* as separate species on the basis of the difference in stem cross section. Recently, Bakalin (2005, 2011) again used the name in the sense of Müller (1954). A lectotype should be selected for *L. longiflora* and, if needed, an epitype. Until then we use the name *Lophozia guttulata* for *L. longiflora*. The following new synonym is proposed:

Lophozia guttulata (Lindb. et Arnell) A.Evans, Proc. Wash. Acad. Sci. 2: 302, 1900 (Evans 1900).

Basionym:—*Jungermannia guttulata* Lindb. et Arnell, Kongl. Svenska Vetensk.-Akad. Handl. n.f. 23 (5): 51, 1889 (Lindberg & Arnell 1889).

= *Lophozia porphyroleuca* var. *viridis* Schiffn., Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag 51: 273, 1903 (Schiffner 1903), **syn. nov.** Type:—CZECH REPUBLIC. Böhmen: auf faulen Stämmen und Stöcken in den Wäldern bei Salnau im südlichen Böhmerwalde. 900–1100 m, Sept. 1902 lgt V. Schiffner, Hep. eur. exs. no. 150 (lectotype [here designated] FH!).

Conspectus of *Lophozia*:—The following list includes the taxa accepted here in *Lophozia* (bold) together with their main recent synonyms. Taxa of uncertain synonymy are placed under all possible accepted taxa, as discussed above, preceded by a question mark.

Lophozia ascendens (Warnst.) R.M.Schust., *Bryologist* 55: 180, 1952 (Schuster 1952). Basionym: *Sphenolobus ascendens* Warnst., *Hedwigia* 57: 63, 1915 [1916] (Warnstorf 1916). ***Lophozia austro-sibirica*** Bakalin, *Ann. bot. Fenn.* 40: 49, 2003 (Bakalin 2003). ***Lophozia ciliata*** Damsh., L.Söderstr. et H.Weibull, *Lindbergia* 25:3, 2000 (Söderström et al. 2000). ***Lophozia guttulata*** (Lindb. et Arnell) A.Evans, Proc. Wash. Acad. Sci. 2: 302, 1900 (Evans 1900). Basionym: *Jungermannia guttulata* Lindb. et Arnell, Kongl. Svenska Vetensk.-Akad. Handl. n.f. 23 (5): 51, 1889 (Lindberg & Arnell 1889). ?= *Lophozia longiflora* (Nees) Schiffn. Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag 51: 257, 1903 (Schiffner 1903). ***Lophozia lacerata*** N.Kitag., *Hikobia* 3: 172, 1963 (Kitagawa 1963). ***Lophozia lantratoviae*** Bakalin, *Ann. Bot. Fenn.* 40: 47, 2003 (Bakalin 2003). ***Lophozia murmanica*** Kaal., *Rep. Second Norweg. Arctic Exped.* 11: 34, 1906 (Bryhn 1906). ?= *Lophozia groenlandica* (Nees) Macoun, *Cat. Canad. Pl., Lich. Hepat.*: 19, 1902 (Macoun 1902). = *Lophozia heteromorpha* R.M.Schust. et Damsh., *Hepat. Anthocerotae N. Amer.* 2: 507, 1969 (Schuster 1969). ***Lophozia pacifica*** Bakalin, *Bryologist* 114: 302, 2011 (Bakalin 2011). ***Lophozia pallida*** (Steph.) Grolle, *J. Jap. Bot.* 39: 14, 1964 (Grolle 1964). Basionym: *Anastrophyllum pallidum* Steph., *Bull. Herb. Boissier ser. 2, 1*: 1131 (*Spec. Hep.* 2: 114), 1901 (Stephani 1901). = *Lophozia handelii* Herzog, *Symb. Sin.* 5: 14, 1930 (Herzog 1930). ***Lophozia savicziae*** Schljakov, *Novosti Sist. Nizsh. Rast.* 10: 299, 1973 (Schljakov 1973). ***Lophozia schusterana*** Schljakov, *Novosti Sist. Nizsh. Rast.* 12: 320, 1975 (Schljakov 1975). ***Lophozia silvicola*** H.Buch, *Rep. 18. Scand. Naturalist Congr.*, 228. 1929 (Buch 1929). ***Lophozia silvicoloides*** N.Kitag., *J. Hattori Bot. Lab.* 28: 276, 1965 (Kitagawa 1965). ***Lophozia subapiculata*** R.M.Schust. et Damsh., *Meddel. Grønland* 199 (1): 104, 1974 (Schuster & Damsholt 1974). ***Lophozia ventricosa*** (Dicks.) Dumort., *Recueil Observ. Jungerm.*: 14, 1835 (Dumortier 1835). Basionym: *Jungermannia ventricosa* Dicks., *Pl. Crypt. Brit.* 2: 14, 1790 (Dickson 1790). ?= *Lophozia groenlandica* (Nees) Macoun, *Cat. Canad. Pl., Lich. Hepat.*: 19, 1902 (Macoun 1902). ?= *Lophozia longiflora* (Nees) Schiffn. Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag 51: 257, 1903 (Schiffner 1903). ?= *Lophozia confertifolia* Schiffn., *Österr. Bot. Z.* 55: 47, 1905 (Schiffner 1905). ***Lophozia wenzelii*** (Nees) Steph., *Bull. Herb. Boissier ser. 2, 2*: 35 (*Spec. Hep.* 2: 135), 1902 (Stephani 1902a). ?= *Lophozia groenlandica* (Nees) Macoun, *Cat. Canad. Pl., Lich. Hepat.*: 19, 1902 (Macoun 1902). ?= *Lophozia confertifolia* Schiffn., *Österr. Bot. Z.* 55: 47, 1905 (Schiffner 1905).

New synonym and combination in *Trilophozia*

Trilophozia quinquedentata (≡ *Tritomaria quinquedentata* (Huds.) Buch (1933: 290)) is a variable species and many varieties and subspecies have been proposed. De Roo et al. (2007) showed that *Tritomaria quinquedentata* subsp. *turgida* (Lindb. in Lindberg & Arnell 1889: 59) Damsholt (1982: 98) cannot molecularly be separated from typical plants although there are some morphological differences. The variety *Tritomaria quinquedentata* var. *grandigemma* from Yamal peninsula was described with larger gemmae than usual (22–29 x 16–20 µm) as the main differentiation character. As size of gemmae is a variable character, the variety does not merit recognition without other supporting evidence.

Trilophozia quinquedentata (Huds.) Bakalin, *Monogr. Lophozia*: 34 (Bakalin 2005).

Basionym:—*Jungermannia quinquedentata* Huds., *Fl. Angl. (Hudson)*: 433, 1762 (Hudson 1762).

= *Tritomaria quinquedentata* var. *grandigemma* Potemkin, *Arctoa* 2: 80, 1993 (Potemkin 1993), **syn. nov.** Type:—RUSSIA. Yamal-Nenets: Paeninsula Jamal, regio ripae sinistrae fl. Laptajaha adjacens (68° 20' lat. bor., 73° 15' long. orient.) 23.VII.1979, O.V. Rebritstaja (holotype LE).

Kitagawa (1963) studied East Asiatic specimens of *Tritomaria quinquedentata* and distinguished a highly

papillose variety, var. *asymmetrica*. Almost simultaneously, Schuster (1966) described the papillose taxon as subsp. *papillifera*. For now we recognize this taxon at variety level pending further research and the following transfer is done.

Tritophozia quinquedentata* var. *asymmetrica* (Horik.) L.Söderstr. et Váňa, *comb. nov.

Basionym:—*Lophozia asymmetrica* Horik., *J. Sci. Hiroshima Univ., Ser. B., Div. 2, Bot. 2*: 153, 1934 (Horikawa 1934).

Type:—TAIWAN. Tainan: Mt. Morrison (Tâtake-Mayeyama), Aug. 1932, *Y. Horikawa, no. 9140a* (holotype HIRO).

≡ *Tritomaria quinquedentata* var. *asymmetrica* (Horik.) N.Kitag., *Hikobia* 3: 171, 1963 (Kitagawa 1963).

= *Jungermannia trilobata* Steph., *Hedwigia* 34: 50, 1895 (Stephani 1895), *nom. illeg.* (ICN Art. 53.1; hom. illeg. [non L. 1753]). ≡ *Sphenolobus trilobatus* Steph., *Bull. Herb. Boissier ser. 2, 2*: 175 (*Sp. Hepat. [Stephani]* 2: 167), 1902 (Stephani 1902b). ≡ *Tritomaria quinquedentata* subsp. *papillifera* R.M.Schust., *Rev. Bryol. Lichénol.* 34: 275, 1966 (Schuster 1966).

New synonym to *Tritomaria exsecta*

Sphenolobus striolatus from Taiwan is known only from the type consisting of a small shoot fragment with 12 leaves, one of which is broken. Although gemmae are lacking, the leaf cells agree completely with those of *Tritomaria exsecta* in size, slightly thickened walls, small to missing trigones and papillose cuticle. The leaves are unequally bilobed, but similar leaves sometimes occur in *T. exsecta*. We therefore propose the following new synonym.

***Tritomaria exsecta* (Schmidel. ex Schrad.) Schiffn. ex Loeske, *Hedwigia* 49: 13, 1909 (Loeske 1909).**

Basionym:—*Jungermannia exsecta* Schmidel ex Schrad., *Syst. Samml. Crypt. Gew.* 2: 5, 1797 (Schradel 1797).

= *Sphenolobus striolatus* Horik., *J. Sci. Hiroshima Univ., Ser. B., Div. 2, Bot. 2*: 157, 1934 (Horikawa 1934), *syn. nov.*

Type:—TAIWAN. Formosa: Mt. Arisan (Niitakatozanguchi), prov. Tainan, Aug. 1932, leg. *Y. Horikawa, n. 9008/b* (holotype HIRO 9008!). ≡ *Anastrophyllum striolatum* (Horik.) N.Kitag., *Hikobia* 3: 171, 1963 (Kitagawa 1963).

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