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Early Land Plants Today: Taxonomy, systematics and nomenclature of Gymnomitriaceae

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Table of contents

Abstract

There remains a critical need to synthesize the vast amount of nomenclatural, taxonomical and global distributional data for liverworts. This is fundamental in taxonomists' efforts towards developing a working list of all known plant species under the auspices of the Convention on Biological Diversity (CBD) as well as having far reaching implications and applications, including providing a valuable tool for taxonomists and systematists. We here provide the first synthesis of the taxonomy, systematics, and nomenclature of the family Gymnomitriaceae. The family is here conservatively treated to include ten genera representing 73 accepted species. We propose 149 new synonyms, 102 of them for validly published names. Significantly, we briefly discuss recent developments based on molecular studies and we predict future investigations will dramatically redefine the family. Detailed taxonomy and nomenclature is treated for almost 800 names associated with the family. Noteworthy remarks on various aspects of the distribution, ecology, conservation, and biology of members of the family are also included.

Key words: synonymies, check-list, *Acrolophozia, Apomarsupella, Gymnomitrion, Herzogobryum, Marsupella, Nanomarsupella, Nothogymnomitrion, Paramomitrion, Poeltia, Prasanthus*

Introduction

Recently there has been a major international effort to synthesize the vast amount of nomenclatural, taxonomical and global distributional data for Marchantiophyta (Söderström *et al.* 2008, von Konrat *et al.* 2008, 2009). An introduction to the project, including overall project objectives, detailed description of standards used and applied, and discussion on the critical need for synthesizing data is outlined in Söderström *et al.* (2008) and von Konrat *et al.* (2010). We here provide the first synthesis of the taxonomy, systematics, and nomenclature of the family Gymnomitriaceae H.Klinggr. This has been a collaborative effort between Jiří Váňa, who is a leading authority with many publications on the family (e.g., Váňa 1976b, c, 1999, 2003, Váňa

& Piippo 1989), and coordinators of the Early Land Plants Today project. The family is here circumscribed to include ten genera. This includes: four monotypic genera of *Poeltia* Grolle, *Nothogymnomitrion* R.M.Schust., *Nanomarsupella* (R.M.Schust.) R.M.Schust., and *Paramomitrion* R.M.Schust.; *Prasanthus* Lindb. with 2 species (Fig. 1); *Acrolophozia* R.M.Schust. with 3 species; *Apomarsupella* R.M.Schust. and *Herzogobryum* Grolle each with 5 species; and the two larger and more widespread genera, *Gymnomitrion* Corda (Fig. 2) and *Marsupella* Dumort. (Fig. 3), each with 27 species.

FIGURE 1. *Prasanthus suecicus* (Gottsche) Lindb. Photo Michael Lüth.

FIGURE 2. *Gymnomitrion concinnatum* (Lightf.) Corda. Photo Michael Lüth.

FIGURE 3. *Marsupella aquatica* (Lindenb.) Schiffn. Photo Michael Lüth.

A brief synopsis of the historical and contemporary taxonomy and systematics of the family is provided. This is followed by brief, but noteworthy remarks on various aspects of the distribution, ecology, conservation, and biology of members of the family. The central part of the paper is in the detailed taxonomy and nomenclature of the close to 800 names associated with Gymnomitriaceae. It includes accepted names, synonyms, authorities, original citations, type data, references to relevant parts of the latest International Code for Botanical Nomenclature (McNeill *et al.* 2006), a 3-level coding system to indicate the level of knowledge about a taxon, as well as auxiliary data and annotations. There has been no prior publication that attempts to unify this vast amount of taxonomic and nomenclatural data in such detail for the family.

Taxonomic history

Historically Gymnomitriaceae included only two widespread genera, *Gymnomitrion* and *Marsupella*. However, for many decades in the 20th century the name Marsupellaceae had almost been equally applied to the same genera since Buch (1936) first proposed the family (Schuster 1974). The family was expanded to include *Prasanthus* with only one species at the time (Kitagawa 1963b) and later to include a second species, *P. jamalicus*[1], described more than 100 years later (Potemkin 1992c). It is evident that there is a very complex and contentious interrelationship between *Gymnomitrion* and *Marsupella*, which has been treated and discussed extensively in works by Müller (1942, 1956), Knapp (1930), Kitagawa (1963b), Schuster (1974, 1996b, 2002b), and Váňa (2003). Over the past several decades the family has been expanded to include several additional genera, i.e., *Herzogobryum* (Grolle 1966j), *Acrolophozia* (Schuster 1966c), *Poeltia* (Grolle 1966j), *Lophonardia* (Schuster 1978), *Apomarsupella* (Schuster 1996b), and *Nothogymnomitrion* (Schuster 1996b). *Eremonotus* Lindb. et Kaal. *ex* Pearson (Schuster 1969b as *Anomomarsupella*) and *Paramomitrion* have also been placed in Gymnomitriaceae (Schuster 1984, 1996b). Schuster (1984) assigned both *Eremonotus* and *Paramomitrion* to their own subfamily Eremonotoideae R.M.Schust., which was invalidly described at the time, but later validated in Schuster (1996b). Similarly, Schuster (1996a) placed the monotypic *Lophonardia* into its own subfamily, Lophonardiodeae. In that same paper Schuster also promoted the monotypic subgenus *Marsupella* subg. *Nanomarsupella* to genus level.

Stephaniella J.B.Jack (1894: 11) and *Stephaniellidium* S.Winkler *ex* Grolle (1983: 38) were also included, albeit tentatively, in Gymnomitriaceae (e.g., Schuster 1969a, 1974). The definite placement of both genera to Gymnomitriaceae was proposed by Schuster (1984). However, Schuster (2002b) later removed these two genera from Gymnomitriaceae and placed them in the Stephaniellaceae (Schuster 1984: 67) Schuster (2002: 584). It is apparent that the recognition of *Poeltia* in the family also is problematic. Schuster (1996b) reduced the genus to a subgenus of *Marsupella*, but Váňa (1999) demonstrated that it is quite distinct from *Marsupella* and may not even belong to the Gymnomitriaceae based on the study of additional specimens with mature sporophytes. Nevertheless until further evidence comes to hand *Poeltia* is retained here in Gymnomitriaceae. The only species in the genus *Lophonardia* has since been recognized as a synonym of *Lophozia laxifolia* (Montagne 1845: 346) Grolle (1964: 173; Gradstein *et al.* 2001, Engel & Gradstein 2003)—a concept we follow here. Yet, Crandall-Stotler *et al.* (2009) recently retained the genus in Gymnomitriaceae.

Váňa (2003) provided an excellent discourse outlining the inherent difficulty of circumscription and delimitation of the genera and subgenera in the complex *Gymnomitrion – Marsupella – Apomarsupella*. In that paper, Váňa provided a detailed analysis and critique of the historical morphological concepts used to distinguish *Gymnomitrion* and *Marsupella*. In brief, up until the end of the first half of the 20th century, the structure of the female inflorescense was used as a "crucial criterion separating *Gymnomitrion* and *Marsupella"* (Schuster 2002b: 565). However Müller (1956) separated both genera giving preference to "gymnomitrioid" or "marsupelloid" characters of the habit. Váňa (2003) also identified several problems that contributed to a lack of knowledge in this complex, including a) inadequate knowledge of the distribution of nearly all taxa, b) lack of fertile material in some taxa, c) omission of several important and taxonomically problematical taxa in previous studies, e.g., Schuster (1996b, 2002b), and d) lack of modern biosystematic and molecular studies.

The infrageneric classification of both *Gymnomitrion* and *Marsupella* remains to be fully clarified, yet the works of Kitagawa (1963b), Schuster (1974, 1996b) and Váňa (1999) provide the foundation of the current infrageneric classification for both genera. Arnell (1956) described *Gymnomitrion* subg. *Nardiocalyx*. Váňa (2003) highlighted this subgenus as one of several problems that complicate the morphological boundaries used to delimit both *Gymnomitrion* and *Marsupella*, and Schuster (2002b) also stated that this species "does not fit well into *Gymnomitrion*". Kitagawa (1963b) described the subgenera, subg. *Archiogymnomitrion* and

1. Authorities for taxa treated in this paper can be found in the taxonomic section.

subg. *Integrifolium* N.Kitag. for *Gymnomitrion*. The latter subgenus was monotypic with *G. integerrimum* from Japan and only known from male plants at the time, and later placed by Inoue (1983b) as a synonym of *Cryptocoleopsis imbricata* Amakawa. Schuster (1974, 1996b) segregated subg. *Gymnomitrion* into four sections, sect. *Corallioides*, sect. *Apiculatae*, sect. *Dianthelia*, and sect. *Gymnomitrion* as well as recognizing sect. *Crenarion*.

The infrageneric classification of *Marsupella* has had many modifications over the decades. This has in part been due to the establishment of purportedly allied genera, and the contractions and expansions of generic, subgeneric and even sectional concepts. The most recent and extensive treatise discussing generic and subgeneric boundaries of Gymnomitriaceae was by Schuster (2002b) who remained uncommitted and proposed two alternative and competing classification schemes. On the one hand *Apomarsupella*, *Nanomarsupella* and *Poeltia* were retained as three autonomous genera, but in a competing scheme they were recognized as three subgenera within *Marsupella*. Kitagawa (1963b) described two subgenera, subg. *Neomarsupella* and subg. *Stolonicaulon* and later Schuster (1996b, 2002b) described subg. *Nanocaulon*, *Micromarsupella*, and *Amphimarsupella*. Schuster (1974) also described *Marsupella subg. Marsupella* sect. *Boeckiae* and sect. *Funckiae*. Váňa (1999) recommended a significant rearrangement in the infrageneric classification of *Marsupella*, reducing *Stolonicaulon* to a section within subg. *Marsupella*, *Neomarsupella* and *Micromarsupella* to sections within subg. *Homocraspis*, and reduced subg. *Nanocaulon* to a synonym of *Marsupella* sect. *Boeckiae*.

Contemporary Taxonomy and Systematics

Overview:— The increased application of molecular data over recent years to create phylogenetic reconstructions has generated novel insights into the evolutionary history of liverworts and subsequent classification (Crandall-Stotler *et al.* 2009). Unfortunately, to date only a few such studies have incorporated exemplars of Gymnomitriaceae s.l. into their analyses. Yet molecular data may provide us with the very tools we need in order to unravel both inter-generic and infra-generic relationships within the group. Although Schuster (1996b, p.3) stated that a consensus "has begun to appear" as to the limits of Gymnomitriaceae, later, Schuster (2002b) declared that inclusion of the genera *Stephaniella*, *Eremonotus*, *Paramomitrion*, and *Lophonardia* made the perimeters of the family almost indefinable. Indeed, evidence from recent molecular studies is supporting that supposition. De Roo *et al.* (2007) provided evidence based on DNA sequences of the chloroplast *rps4* gene and the *trnG* intron showing that *Stephaniella* was nested within a strongly supported Arnelliaceae. Crandall-Stotler *et al.* (2009) in the latest classification of Marchantiophyta subsequently placed *Stephaniella* and *Stephaniellidium* in Arnelliaceae. Similarly, Hentschel *et al.* (2007) proposed to include the monospecific holarctic *Eremonotus* in the Jungermanniaceae based on the phylogenetic reconstructions of cpDNA variation. Hentschel *et al.* (2007) appropriately noted that the genus represented an excellent example of the problematic interpretations of morphological similarities in taxa with a minute size. Interestingly, although Crandall-Stotler *et al.* (2009) placed *Eremonotus* in the Jungermanniaceae, they did not include *Paramomitrion*, which is presumably closely allied (Schuster 2002b).

Other investigations that have included exemplars of Gymnomitriaceae include Davis (2004), Yatsentyuk *et al.* (2004), Forrest *et al.* (2006), and He-Nygrén (2007). Most of these studies resolve Gymnomitriaceae typically as a monophyletic group, but in most studies only *Marsupella* and *Gymnomitrion* have been sampled (Crandall-Stotler *at al.* 2009). Davis (2004) and Forrest *et al.* (2006) also analyzed *Herzogobryum teres* which they indicated was aligned with the Cephaloziellaceae–Scapaniaceae lineage. Unpublished molecular data (J. Shaw *et al.*, pers. comm.) indicates that *Herzogobryum* may be polyphyletic and not part of Gymnomitriaceae in the traditional sense. However, we follow the Crandall-Stotler *et al.* (2009) classification here and maintain *Herzogobryum* as an element of the Gymnomitriaceae until the type species *Herzogobryum vermiculare* has been included in future studies.

The study by Vilnet *et al.* (2007) remains the only investigation to date that includes significant exemplars of Gymnomitriaceae with eleven species of *Marsupella*, four species of *Gymnomitrion* as well as *Prasanthus*

suecicus. Their phylogenetic reconstruction inferred from ITS1-2 nrDNA and trnL-F cpDNA possibly has important implications. This underscores the critical need for a complete revision of Gymnomitriaceae with exemplars representing as many species as possible in order to unravel generic and infrageneric relationships. Vilnet *et al.* (2007) stated their study supported previous investigations indicating that Gymnomitriaceae is a monophyletic group. However only three of the ten genera traditionally assigned to the family were included in their investigation.

Significantly, the authors include the type species of all three genera in their analyses, which despite the plethora of molecular studies is not always done, yet critical before translating a phylogeny into a classification scheme. As the only detailed molecular study to date it warrants further discussion here. Based on their analyses of 17 taxa, Vilnet *et al.* (2007) indicate that *Gymnomitrion* and *Marsupella* are polyphyletic. Specifically they suggest that species of *Gymnomitrion* subg. *Nardiocalyx* (with *G. apiculatum*) belong to *Marsupella* while species of *Marsupella* subg. *Homocraspis* (*Marsupella alpina*, *M. brevissima* and *M. commutata* included in the study) are members of *Gymnomitrion*, which they state is also supported by morphological studies by Müller (1909c), and confirm that perianth and perigynium development or reduction is an important character for classification within Gymnomitriaceae. Finally, Vilnet *et al.* (2007) present evidence that *Marsupella aquatica*, supported by a high bootstrap value should indeed be considered a distinct species, which is adhered to in our current treatise of the family.

Critical need for re-evaluation of the family—. In the following treatment we retain a conservative circumscription of the family to include the ten genera *Poeltia*, *Nothogymnomitrion*, *Nanomarsupella*, *Paramomitrion*, *Prasanthus*, *Acrolophozia*, *Apomarsupella*, *Herzogobryum*, *Gymnomitrion* and *Marsupella*. However, all indications strongly suggest that the family will be dramatically redefined with future investigations. Indeed, after such studies, the family may only be represented by possibly four genera. For instance, published and unpublished molecular data (J. Shaw, *pers. comm*.) already provide strong evidence that *Nanomarsupella* and *Herzogobyrum* are untenable in Gymnomitriaceae. And the retaining of *Paramomitrion* in Gymnomitriaceae remains in doubt, considering it is apparently closely allied to *Eremonotus*, which has been discussed above to be placed in the Jungermanniaceae. Finer resolution and refinement of the family will only be achieved with multi gene analyses as well as a full reappraisal of the morphology. The inclusion of the type species of each genus as well as critical exemplars will also be fundamental in order to unravel the family boundaries.

Monographs and Revisions

The treatment of Gymnomitriaceae by Schuster (1974) for North America and the broader treatments by Schuster (1996b, 2002b) that included southern hemisphere and "critical" taxa worldwide remain the most influential studies in the detail of the descriptions, illustrations, morphological assessment and keys. Other significant regional studies on Gymnomitriaceae that have broad implications include: Kitagawa (1963b) for East Asia; Müller (1956) for Europe; Váňa (1976c) for New Guinea; Váňa (1976b) for several Andean species; Váňa and Piippo (1989) for the Huon Peninsula, Papua New Guinea; Váňa (1993) for Zaire and Rwanda; Váňa (2003) for Latin America; Váňa and Watling (2004) for Uganda; Blockeel *et al.* (2005) for Hunan Province, China; and Engel and Glenny (2008) for New Zealand. The treatment by Váňa (2003) for Latin America was particularly extensive and included keys to 14 species, three new combinations, two new records, and many additional data relating to distribution and synonymy as well as a nothworthy analysis of the generic boundaries of *Gymnomitrion* and *Marsupella*. Váňa (1999) summarized the present state of knowledge at that time for the Jungermanniineae stating that there remained no worldwide monograph for *Gymnomitrion* and *Marsupella*. Despite the extensive treatments by Schuster this remains true for the group today. Grolle's (1966j) and Schuster's (1996b) treatments of *Herzogobryum* remain the only studies of that scale to date for the genus.

Morphology

For descriptions of the family and at least selected genera see Schuster (1974, 1996b, 2002b), Váňa (1993), Váňa and Piippo (1989), Váňa and Watling (2004), Engel and Glenny (2008), and Crandall-Stotler *et al.* (2009). The following provides a very brief synthesis from the aforementioned papers of the morphology: Plants often form dense mats or cushions and are rarely intermixed between other bryophytes. Shoots typically small, e.g., reaching 5-80 mm high and only 0.1–3.5 mm wide, usually erect or ascending, and rarely prostrate. Leaves transverse to weakly succubous, interlocking dorsally, with insertions extending across the stem midline, 2-lobed (rarely undivided), with the apices and margins often hyaline; leaf surface either smooth or papillose. Oil-bodies mostly 2–3 per cell, spherical to ovoid, colorless, granular to papillose. Underleaves absent or vestigial and very small; rhizoids scattered; branches lateral, of the *Plagiochila*-type, rarely *Frullania*-type. Plants mostly dioicous or paroicous. Androecia and gynoecia on leading axes; androecia scarcely differentiated from vegetative regions. Sporophytes uncommon; enclosed by either a true or a shoot calyptra and a perianth or stem perigynium–perianth complex (or incipient hollow marsupium in *Prasanthus*). Perianths short, nonemergent, or lacking (replaced by large bracts in *Gymnomitrion*). Capsules spheroidal, with the wall 2-stratose, with the inner wall cells quadrate, with nodular thickenings; elaters 2–(rarely 3–4)-spiral. Asexual reproduction absent.

Chemistry and cytology

It is well established that the chemical constituents of liverworts show important biological activities, and that the major substances, particularly the sesqui- and diterpenes, are valuable chemical markers in chemosystematic studies (e.g., Asakawa 1990, 1995, 2007, Mues 2000). Interestingly, Gymnomitrone, a sesquiterpene ketone, was only known as a synthetic product but was found in nature for the first time in *Gymnomitrion obtusum* (Warmers & König 1999). Asakawa (2004) provided a brief synopsis of more than a dozen chemical studies of Gymnomitriaceae stating that many interesting chemical compounds have been isolated from members of the group and identified the application of chemical markers to chemosystematics, e.g., the identification least two chemotypes of *M. aquatica* in Europe. As early as 1972, Connolly *et al.* (1972) discovered Gymnomitrol, a novel tricyclic sesquiterpenoid isolated from *Gymnomitrion obtusum,* and recently Scher *et al.* (2004) showed that the compound has moderate antifungal activity. In particular, the chemical composition of the liverwort *M. emarginata* has been studied by several groups with a number of interesting compounds being reported (Adio & König 2007). Asakawa (2007) reported that the crude ether extract from *M. emarginata* showed cytotoxicity against P-388 in vitro [leukemia cells]. Recently, nine new amorphane sesquiterpenoids were identified for *Marsupella aquatica* from Austrian specimens (Adio *et al.* 2007) and a new sesquiterpenoid was isolated from *M. emarginata* (Adio & König 2007).

The following chromosome numbers have been reported for the family: *Gymnomitrion concinnatum* n = 8+m (Kuta *et al.* 1984), *Herzogobryum teres* n = 8+ m (Ochyra *et al.* 1982), *Marsupella emarginata* n = 9 (8+m?; Inoue H. 1989), *M. yakushimensis* n = 9 (8+m; Tatuno 1938, 1941a, 1941b).

Distribution

Fig. 4 provides an overview of the distribution of the family throughout the world. The diversity of Gymnomitriaceae, with the exception of some isolated elements, is concentrated in the Northern Hemisphere. Söderström *et al.* (2002, 2007) provided detailed distribution for the species of the family across Europe and Macaronesia.

Marsupella, with the most species of the family, is largely confined to the Northern Hemisphere with a wide distribution in the holarctic and isolated extensions into high elevated areas of the Neotropics as well as central Africa, South Africa, and austral regions (Váňa 1985, 2003, Schuster 1996b, Engel & Glenny 2008).

Interestingly, the genus has two bipolar species, *Marsupella sprucei* and *M. sparsifolia* (Engel & Glenny 2008). The other large genus, *Gymnomitrion*, is also predominately Northern Hemisphere in distribution. Elsewhere, there are only a few taxa that occur in southern South America, Australasia, Central and South Africa. Engel and Glenny (2008) state that the first credible report of the genus in the Southern Hemisphere was by Váňa in 1976 who reported *G. concinnatum* from southern South America. However, in fact, *G. laceratum* and *G. bolivianum* were actually earlier described from South Africa and the Andes respectively. *Prasanthus* with two species is restricted to the Northern Hemisphere. *Prasanthus suecicus* is distributed in Greenland, the European Alps, Scandanavia and the Arctic regions, and *P. jamalicus* Potemkin was described from the Yamal Peninsula, West Siberian Arctic (Potemkin 1992c).

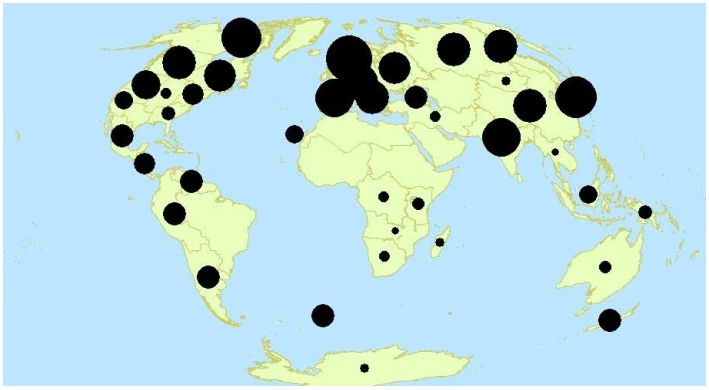

FIGURE 4. Number of Gymnomitriaceae species in broadly defined regions of the world. The number range from 0 to 24 species

Acrolophozia, with three species, is subantarctic in range with *A. fuegiana* known from South Georgia, the Falkland Islands, and Tierra del Fuego, *A. sulcata* being apparently endemic to South Georgia, and *A. pectinata* known from the New Zealand botanical region (Engel & Glenny 2008). Similarly, the five species of *Herzogobyrum* are all alpine and have a distribution of cool to cold south temperate-subantarctic in range, and some with a circum-subantarctic distribution (Schuster 2002b). New Zealand is considered a center of diversity with all species occurring except *Herzogobryum molle* (Engel & Glenny 2008). The monotypic *Nothogymnomitrion* has a mainly subantarctic distribution and is a common subalpine-alpine plant (Grolle 1966j, Schuster 1992, Engel & Glenny 2008). Its distribution includes Tasmania (type locality), New Zealand and southern South America, including Tierra del Fuego, Tristan da Cunha, and South Georgia.

Apomarsupella with five species includes three species that are known from China, Eastern Asia and the Indian the Subcontinent, *A. revoluta* has a disjunct holarctic distribution, extending to Borneo and New Guinea, and *A. africana* in Africa and Latin America. Váňa noted that previous reports of *A. revoluta* from Venezuela (e.g., Schuster 1974, Long & Grolle 1990, and Schuster 2002b) are erroneous. These were based on specimens collected by B. & F. Oberwinkler and J. Poelt, which are in fact *A. africana*. There are three monotypic genera all with apparently very restricted distribution. *Nanomarsupella* and *Paramomitrion* are only known from the northern Andes. Schuster (2002b) described *Nanomarsupella* as a ”strange plant” stating it could be placed as a subgenus within *Marsupella* or *Gymnomitrion*, and is only known from the type specimen. Similarly, *Paramomitrion* is only known from the type collection and Schuster (1996b) admittedly could not convincingly place it in any family although he was certain a distinct genus was at hand. The third monotypic genus, *Poeltia*, Schuster (1996b) mistakenly stated that it was only known from the type collection from the Himalayas. In fact, *Poeltia* has been reported mulitple times from Nepal, including by Noguchi *et al.* (1966), Mizutani (1979d), Mizutani *et al.* (1995), and Miehe (1990), as well as from Bhutan (coll. *G. & S. Miehe*, det.Váňa, unpublished data).

Even in the last decade, there remain many new and significant records being reported reflecting that many regions remain under-collected as well as being under-reported because of their often small size. For

example, within the last ten years Zhu *et al.* (1998) reported *Marsupella pseudofunckii*, *M. yakushimensis* as new to Zhejiang Province; Furuki (2000) reported *Marsupella emarginata* as a new record for Shikoku, Southern Japan; Furuki *et al.* (2001) reported *Marsupella pseudofunckii* as new to the Izu Islands; Lönnell *et al.* (2002) reported *Marsupella arctica* found in Padjelanta, northern Sweden, as new to the European mainland; Czernyadjeva et al (2005) reported *Marsupella condensata* as a new record for Kamchatka Peninsula, Russia, and Bakalin (2003) reported a further 7 species of *Marsupella* and *Gymnomitrion*; Váňa *et al.* (2005a) reported *Marsupella emarginata* (Ehrh.) Dumort. as a new record for Hunan and for mainland China; and Blockeel *et al.* (2005) reported *Gymnomitrion alpinum* as new for Yukon, Canada, which represented a major range extension for the taxon. Váňa (2003) reported significant new distributional records for Latin America. In all, Váňa (2003) disclosed ten new records for Latin America, including *Gymnomitrion asperulatum* for Costa Rica, which was prior to that time only known from the type specimen from Venezuela, *Gymnomitrion atrofilum* for Equador, which was likewise previously only known from the type specimen from Colombia, and *Gymnomitrion pacificum*, which was reported new for Mexico and the whole of Latin America.

Ecology

The majority of species are associated with growth in extremely exposed environments in subalpine or alpine environments from Taymyr Peninsula, the most northern part of mainland Asia, to 4200 m in the Andes. Schuster (2002b) postulated that the lack of asexual reproduction is an adaptation to such environments. Schuster (1996b) suggested that members of the Gymnomitriaceae possibly tolerate higher desiccation and higher levels of ultraviolet illumination than most other hepatics. Other taxa that grow below the tree line can grow in running water, around cascades or on rocks in streams, e.g., *Marsupella sphacelata* (Schuster 2002b). In a review paper of bryophyte physiological ecology Proctor (2008) noted that the glaucous-looking taxon *Gymnomitrion obtusum* bears conspicuous epicuticular wax as an adaptation to reconcile the potentially conflicting requirements of water conduction and storage, and free gas exchange for photosynthesis. Bates (2008), in a discussion paper on mineral nutrition and substratum ecology, identifies *Gymnomitrion* and *Marsupella* as containing many obligate epiliths, but bryophytes inhabiting rocks have received less attention than epiphytes. Interestingly, Odland & Munkefjord (2008) included *Marsupella* in their investigation of using plants as indicators of snow layer duration in southern Norwegian mountains. Likewise, *Marsupella* was used in an investigation of aquatic bryophytes as indicators of acidification and eutrophication (Stetzka & Baumann 2002). Whether bryophytes have mycorrhizas or not is still a debatable issue, but many liverworts and hornworts have fungal associations (Read *et al.* 2000). Wang & Qiu (2006) in a literature survey of over 600 papers of fungal associations with plants listed seven species of Gymnomitriaceae that had been examined for mycorrhizal occurrence, but only *Marsupella emarginata* had a fungal association.

Conservation

Söderström (2006) provided a recent overview of conservation biology of bryophytes, and specifically discussed threats to bryophytes, and provided an evaluation process to determine how threatened a species is, along with suggested actions to conserve bryophytes and bryophyte diversity. Bryophytes start to appear on Red Lists in various parts of the world. However, no Gymnomitriaceae species is currently on the World List of Threatened Bryophytes (IUCN SSC Bryophyte Specialist Group).

Although not on the global Red List, many species of Gymnomitriaceae are represented in national Red Lists. In New Zealand four taxa were reported as part of New Zealand's threatened species list. *Gymnomitrion strictum* var. *inaequalis* was reported as Data Deficient and *Herzogobryum vermiculare*, *H. atrocapillum*, and *H. filiforme* were all reported as Nationally Critical (Glenny & Fife 2005). Several The European Red List

(ECCB 1995) list 6 species using the 'old' IUCN criteria (IUCN 1978), *Marsupella adusta* (Regionally threatened), *M. andreaeoides* (Rare), *M. arctica* (Rare), *M. profunda* (Vulnerable), *M. spiniloba* (Taxonomic problem) and *M. stableri* (Taxonomic problem). Gymnomitriaceae species are also on several national Red Lists in Europe (Table 1).

TABLE 1. Gymnomitriaceae species on Red Lists in various countries of Europe. The two main criteria used are the 'old' IUCN categories (IUCN 1978) where Ex=Extinct, Ev= Vanished, E=Endangered, V=Vulnerable, R=Rare, I=Indeterminate, and the 'new' IUCN Criteria (IUCN 1994) where EX=Extinct, RE=Regionally Extinct, CR=Critically Endangered, EN=Endangered, VU=Vulnerable and DD=Data deficient

Country	Criteria	Taxa included	Reference
Svalbard	new	*Gymnomitrion apiculatum* (VU), *Marsupella arctica* (VU), *M. condensata* (VU)	Frisvoll & Blom 1997
Norway	new	*Marsupella spiniloba* (DD)	Kålås *et al.* 2006
Sweden	new	*Apometzgeria pubescens* (DD), *Marsupella andreaeoides* (DD)	Gärdenfors 2005
Finland	new	*Marsupella funckii* (RE), *M. sparsifolia* (VU), *M. sphacelata* (VU), *M. sprucei* (VU)	Laaka-Lindberg *et al.* 2009
Britain	new	*Gymnomitrion apiculatum* (VU), *Marsupella arctica* (VU), *M. profunda* (VU), *M. sparsifolia* (VU)	Church *et al.* 2001
Netherlands	new	*Marsupella emarginata* (CR), *M. funckii* (EX)	Siebel *et al.* 2000
Belgium	own citeria	*Marsupella sphacelata* (rare), *M. sprucei* (rare)	De Zuttere & Schumacker 1984
Luxembourg	new	*Marsupella funckii* (VU)	Werner 2003
Germany	own citeria	*Marsupella adusta* (probably vanished), *M. boeckii* (extremely rare), *M. aquatica* (vulnerable), *M. funckii* (vulnerable), *M. ramosa* (presumably threatened), *M. sparsifolia* (extremely rare), *M. sphacelata* (vulnerable), *M. sprucei* (endangered)	Ludwig *et al.* 1996
Poland	old	*Apometzgeria pubescens* (V), *Gymnomitrion obtusum* (R), *Marsupella emarginata* (V).	Szweykowski 1992
Switzerland	new	*Gymnomitrion apiculatum* (VU), *G. obtusum* (VU), *Marsupella adusta* (VU), *M. alpina* (VU), *M. boeckii* (VU), *M. commutata* (VU), *M. sparsifolia* (VU)	Schnyder *et al.* 2004
Austria	old	*Marsupella adusta* (I), *M. alpina* (I), *M. ramosa* (I), *Prasanthus suecicus* (I)	Saukel & Köckinger 1999
Czech Republic	new	*Gymnomitrion coralloides* (EN), *G. obtusum* (DD), *Marsupella adusta* (RE), *M. alpina* (EN), *M. brevissima* (RE), *M. sparsifolia* (EN), *M. sprucei* (CR)	Kučera & Váňa 2005
Slovakia	old	*Apometzgeria pubescens* (R), *Gymnomitrion apiculatum* (E), *G. concinnatum* (I), *G. coralloides* (R), *G. obtusum* (Ex), *Marsupella alpina* (R), *M. boeckii* (R), *M. brevissima* (I), *M. commutata* (I), *M. condensata* (R), *M. ramosa* (R), *M. sparsifolia* (R), *M. sphacelata* (I), *M. sprucei* (I)	Kubinská *et al.* 1996
Hungary	old	*Marsupella emarginata* (R)	Rajczy 1990
Portugal	new	*Marsupella adusta* (EN), *M. profunda* (R), *M. sprucei* (R)	Sérgio *et al.* 2007

.....continued

TABLE 1 (continued)

Country	Criteria	Taxa included	Reference
Spain	new	*Marsupella alpina* (EN), *M. brevissima* (VU), *M. sparsifolia* (DD).	Sérgio *et al.* 2007
Italy	old	*Apometzgeria pubescens* (E), *Marsupella adusta* (Ev), *M. alpina* (Ev), *M. boeckii* (V), *M. brevissima* (E), *M. commutata* (Ev), *M. condensata* (E), *M. sparsifolia* (Ev), *M. sphacelata* (R)	Aleffi & Schumacker 1995
Bulgaria	new	*Gymnomitrion apiculatum* (DD), *G.corallioides* (VU), *Marsupella adusta* (VU), *M. alpina* (VU), *M. brevissima* (VU), *M. funckii* (VU), *M. sparsifolia* (DD)	Natcheva *et al.* 2006
Serbia and Montenegro	new	*Marsupella funckii* (VU)	Sabovljević *et al.* 2004
Madeira	old	*Marsupella adusta* (Ex), *M. profunda* (E)	Sérgio *et al.* 1992

Marsupella profunda has a special status. It occurs only in Britain, Portugal, Madeira and the Azores (Fig. 5) and is listed as a priority species on EU's Habitat Directive (Porley *et al.*, in press). In Britain it is fully protected and grows as a pioneer species on China Clay waste. However, since the China Clay extraction has ceased very little new habitat spots are opened up and the habitat is disappearing. Therefore, an action plan to secure its long term survival is needed where artificial disturbance is a part of the conservation action.

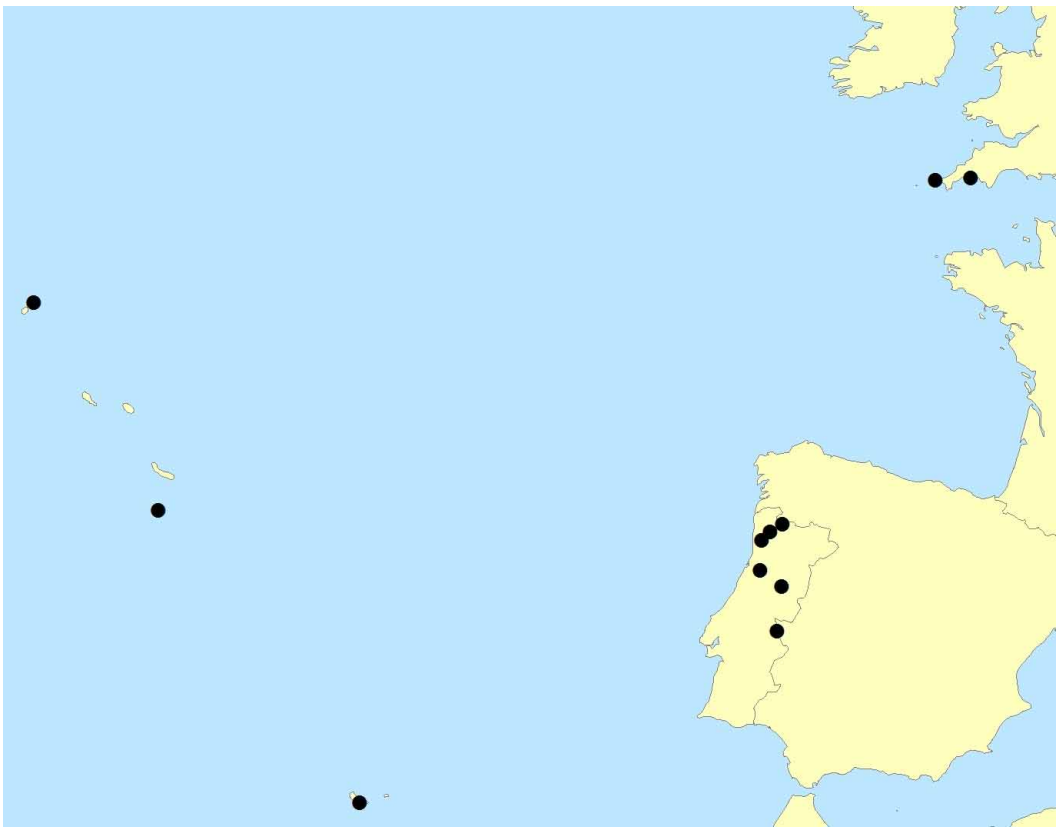

FIGURE 5. World distribution of *Marsupella profunda*.

Encouragingly, *Marsupella sprucei*, which was previously thought to be extinct in the National Park Harz (Saxony-Anhalt, Germany) was reported by Mueller (2008).

Methodology

The detailed methodology undertaken for the current paper including the international standards adopted, the data components, sources and quality control, higher classification adopted, and description of the projects internal standard operating practices is provided in von Konrat *et al*. (2009, 2010) as well as at http://www.early-land-plants-today.org. A large number of taxa, mostly infrataxa, are in need of typification. We have not made any attempts to do that for this compilation except when it potentially could have nomenclatural consequences (Váňa *et al.* 2010).

Each accepted taxon is qualified using a four level ranking system that indicates our level of confidence about a taxons value. The coding convention is outlined in detail by von Konrat *et al.* (2010). Briefly, (?) = problem with the taxon name (one case in the current list); (*) = serious doubts about the value of the taxon (none of the current taxa); (**) = probably a good taxon; (***) = accepted, a good taxon as currently understood. This qualifier follows immediately after the name. Synonyms preceeded by * are invalid or illegitimate and the Article in the ICBN (McNeill *et al.* 2006) as well as a short verbal reason follows. Invalid names do technically not have synonyms according to the ICBN but we still want to associate them with the accepted names. Thus we preceed the synonym statement with a * for those names to mark that this use do not conform to the ICBN.

Gymnomitriaceae H.Klinggr.

Gymnomitriaceae H.Klinggr., *Höh. Crypt. Preuss.*: 16, 1858 (see Klinggräff 1858). Type: *Gymnomitrion* Corda
Gymnomitrioideae R.M.Schust., *J. Hattori Bot. Lab*. 80: 140, 1996 (see Schuster 1996a). Type: *Gymnomitrion* Corda
Marsupelleae Jørg., *Bergens Mus. Skr. n.s.* 16: 60, 1934 (see Jørgensen 1934). Type: *Marsupella* Dumort.
Marsupellaceae H.Buch, *Suomen Maksasammalet*: 89, 1936 (see Buch 1936). Type: *Marsupella* Dumort.

Acrolophozia R.M.Schust.

***Acrolophozia* R.M.Schust.**, *Rev. Bryol. Lichénol*. 34: 259, 1966 (see Schuster 1966). Type: *Acrolophozia pectinata* R.M.Schust.

Acrolophozia fuegiana R.M.Schust. (***)

Distribution:—Southern South America, Subantarctic Islands.

***Acrolophozia fuegiana* R.M.Schust.**, *Nova Hedwigia* 15: 499, 1968 (see Schuster 1968). Type: ARGENTINA: Tierra del Fuego: Cerro Garibaldo, leg. *Schuster* (F, holotype).

Acrolophozia pectinata R.M.Schust. (***)

Distribution:—New Zealand.

***Acrolophozia pectinata* R.M.Schust.**, *Rev. Bryol. Lichénol*. 34: 261, 1966 (see Schuster 1966). Type: NEW ZEALAND: South Island: South Canterbury, 1961, leg. *Schuster* (F, holotype).

Acrolophozia sulcata Hässel (***)

Distribution:—Subantarctic Islands.

***Acrolophozia sulcata* Hässel**, *J. Bryol*. 11: 108, 1980 (see Hässel 1980). Type: SOUTH GEORGIA: Murphy Wall, leg. *Greene* (AAS, holotype).

Apomarsupella R.M.Schust.

****Marsupella* sect. 5. *Revolutae* Müll.Frib.**, *Hedwigia* 81: 113, 1942 (see Müller 1942), *nom. inval.* (Art. 32.1.d; no description). Cited taxon: *Marsupella revoluta* (Nees) Trevis. (≡*Apomarsupella revoluta* (Nees) R.M.Schust.)

****Marsupella* sect. *Revolutae* Müll.Frib.**, *Leberm. Eur.*: 758, 761, 1956 (see Müller 1956), *nom. inval.* (Art. 36.1; no Latin description). Cited taxon: *Marsupella revoluta* (Nees) Trevis. (≡*Apomarsupella revoluta* (Nees) R.M.Schust.)

Marsupella sect. *Revolutae* Müll.Frib. ex R.M.Schust, *Hepat. Anthocerotae N. Amer.* 3: 97, 1974 (see Schuster 1974).

***Apomarsupella* R.M.Schust.**, *J. Hattori Bot. Lab*. 80: 79, 1996 (see Schuster 1996a). Type: *Apomarsupella revoluta* (Nees) R.M.Schust.

Apomarsupella africana (Steph. ex Bonner) R.M.Schust. (***)

Distribution:—West-Central Tropical Africa, East Tropical Africa, Mexico, Central America, Northern South America, Southern South America. Erroneously reported from Eastern Asia.

***Acolea africana* Steph.**, *Spec. Hepat. (Stephani*) 6: 77, 1917 (see Stephani 1917). Type: TANZANIA: Kilimandscharo, 1901, leg. *Uhlig* (G-10873, lectotype by Váňa 1985). Syn. in Váňa 1985.

Gymnomitrion africanum (Steph.) Horik., *Acta Phytotax. Geobot*. 13: 212, 1943 (see Horikawa 1943), "*Gymnomitrium*".

***Marsupella africana* Steph. ex Bonner**, *Candollea* 14: 253, 1953 (see Bonner 1953b). Type: TANZANIA: Kilimandscharo, 1901, leg. *Uhlig* (G-10877, holotype).

Apomarsupella africana (Steph. ex Bonner) R.M.Schust., *J. Hattori Bot. Lab*. 80: 91, 1996 (see Schuster 1996a).

***Marsupella chilensis* Steph. ex Bonner**, *Candollea* 14: 254, 1953 (see Bonner 1953b). Type: CHILE: s. loc., leg. *Gay* (G-10880, holotype). Syn. in Váňa 1985.

***Marsupella hedbergii* S.W.Arnell**, *Ark. Bot*. 3 (16): 544, 1956 (see Arnell 1956b). Type: TANZANIA: Mehru, Olkakola, leg. *Hedberg 2369b* (UPS, holotype). Syn. in Váňa 1985.

****Marsupella subquadrata* Steph.**, *Folia Geobot. Phytotax*. 20: 151, 1985 (see Váňa 1985), *nom. inval.* (Art. 32.1.d, 36.1; no description). Cited material: TANZANIA: Kilimandscharo, Garangabach, 1901, leg. *Uhlig* (G-15048). *Syn. in Váňa 1985.

Apomarsupella crystallocaulon (Grolle) Váňa (***)

Distribution:—Indian Subcontinent.

***Marsupella crystallocaulon* Grolle**, *Khumbu Himal*: 481, 1966 (see Grolle 1966d). Type: NEPAL: Ringmo-Tanga-Rauje, 1962, leg. *Poelt* (M, holotype).

Apomarsupella crystallocaulon (Grolle) Váňa, *Bryobrothera* 5: 227, 1999 (see Váňa 1999).

Apomarsupella revoluta (Nees) R.M.Schust. (***)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Siberia, China, Mongolia, Eastern Asia, Indian Subcontinent, Malesia, Papuasia, Subarctic America, Western Canada, Eastern Canada. Erroneously reported from Russian Far East, Northern South America.

***Sarcocyphos revolutus* Nees**, *Naturgesch. Eur. Leberm*. 2: 419, 1836 (see Nees 1836), "*Sarcoscyphus*". Type: AUSTRIA: Tirol: "Tiroler Alpen", leg. *Funck* (STR, holotype).

Marsupella revoluta (Nees) Trevis., *Rendiconti Ist. Lomb. Sci. Lett.* 7: 783, 1874 (see Trevisan 1874).

Nardia revoluta (Nees) Lindb., *Acta Soc. Sci. Fenn*. 10: 113, 1875 (see Lindberg 1871).

Cesius revolutus (Nees) Lindb., *Kungl. Svenska Vetenskapsakad. Handl*. 23 (5): 65, 1889 (see Lindberg & Arnell 1889), "*Cesia*".

Gymnomitrion revolutum (Nees) H.Philib., *Rev. Bryol*. 17: 34, 1890 (see Philibert 1890), "*Gymnomitrium*".

Acolea revoluta (Nees) Steph., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 150 (11), 1901 (see Stephani 1901).

Apomarsupella revoluta (Nees) R.M.Schust., *J. Hattori Bot. Lab*. 80: 82, 1996 (see Schuster 1996a).

****Jungermannia atrata* Mitt.**, *J. Proc. Linn. Soc., Bot*. 5: 90, 1860 (see Mitten 1860), *nom. illeg.* (Art. 53.1; non Sw. 1788). Type: INDIA: Sikkim: Jongri, leg. *Hooker* (NY, lectotype by Kitagawa 1973a). Syn. in Carrington 1874.

Acolea atrata Mitt., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep.* 2): 145 (6), 1901 (see Stephani 1901).

**Gymnomitrion atratum* (Mitt.) Parihar, *Census Indian hepatics*: 11, 1962 (see Parihar 1962), *nom. inval.* (Art. 33.4; basionym not cited), "*atrata*".

****Sarcocyphos delavayi* Steph.**, *Rev. Bryol*. 20: 108, 1893 (see Bescherelle 1893), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus*". Cited material: CHINA: Tsang Chen, 1889, leg. *Delavay.* *Syn. (*nov.*) in Kitagawa 1973a.

***Marsupella delavayi* Steph.**, *Mem. Soc. Sci. Nat. Cherbourg* 29: 221, 1894 (see Stephani 1894). Type: CHINA: Yunnan: Tsang-Chan, leg. *Delavay* (G-10815, holotype). Syn. (*nov.*) in Kitagawa 1973a.

***Anastrophyllum merrillanum* Steph.**, *Spec. Hepat. (Stephani*) 6: 107, 1917 (see Stephani 1917). Type: PHILIPPINES: Luzon: Mt. Pulog, 1909, leg. *Merrill* (G-13495, holotype). Syn. (*nov.*) in Kitagawa 1973a.

***Gymnomitrion reflexifolium* Horik.**, *J. Sci. Hiroshima Univ. Ser. B, Div. 2, Bot*. 2: 140, 1934 (see Horikawa 1934). Type: TAIWAN: Mt. Morrison, 1932, leg. *Horikawa* (HIRO, holotype). Syn. in Müller 1956.

***Cesius revolutus* var. *gracilis* Bryhn ex Kaal.**, *Bergens Mus. Skr. n.s*. 16: 73, 1934 (see Jørgensen 1934), "*Cesia revoluta*". Type: NORWAY: Rogaland: Suldal; Sør-Trøndelag: Dovre (typification needed). *Syn. nov.*

***Anastrophyllum revolvens* Herzog**, *Ann. Bryol*. 12: 74, 1939 (see Herzog 1939). Type: INDIA: Sikkim: Tsomgo Lake, 1937 leg. *Troll* (JE, holotype). Syn. in Grolle 1969.

Apomarsupella revoluta subsp. *novoguineanensis* R.M.Schust. (**)

Distribution:—Malesia, Papuasia.

***Apomarsupella revoluta* subsp. *novoguineanensis* R.M.Schust.**, *J. Hattori Bot. Lab*. 80: 90, 1996 (see Schuster 1996a). Type: PAPUA NEW GUINEA: Mt. Wilhelm, 1967 leg. *Schuster* (F, holotype).

Apomarsupella revoluta subsp. *revoluta* (**)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Siberia, China, Mongolia, Eastern Asia, Indian Subcontinent, Malesia, Subarctic America, Western Canada, Eastern Canada.

Cesius revolutus var. *revolutus*, *Bergens Mus. Skr. n.s*. 16: 73, 1934 (see Jørgensen 1934), "*Cesia revoluta*".
Apomarsupella revoluta subsp. *revoluta*, *J. Hattori Bot. Lab*. 80: 90, 1996 (see Schuster 1996a).

Apomarsupella rubida (Mitt.) R.M.Schust. (***)

Distribution:—Eastern Asia, Indian Subcontinent. Erroneously reported from China.

***Jungermannia rubida* Mitt.**, *J. Proc. Linn. Soc., Bot*. 5: 90, 1860 (see Mitten 1860). Type: INDIA: Uttarakhand: Kumaon, leg. *Strachey & Winterbottom* (NY, lectotype by Kitagawa 1973a).

Marsupella rubida (Mitt.) Grolle, *Khumbu Himal*: 282, 1966 (see Grolle 1966d).

Apomarsupella rubida (Mitt.) R.M.Schust., *J. Hattori Bot. Lab*. 80: 85, 1996 (see Schuster 1996a).

***Marsupella nitida* N.Kitag.**, *Fl. E. Himalaya*: 523, 1966 (see Hattori 1966a). Type: INDIA: Sikkim: Migothang, 1960, leg. *Hara* (NICH-201199, holotype). Syn. (*nov.*) in Kitagawa 1973a.

Apomarsupella verrucosa (W.E.Nicholson) Váňa (***)

Distribution:—China, Indian Subcontinent.

***Gymnomitrion verrucosum* W.E.Nicholson**, *Symb. Sin*. 5: 10, 1930 (see Handel-Mazzetti 1930). Type: CHINA: Yunnan: Tschiangschel, 1916, leg. *Handel- Mazzetti* (WU, lectotype Váňa *et al.* 2010b).

Marsupella verrucosa (W.E.Nicholson) Grolle, *Trans. Brit. Bryol. Soc*. 5: 86, 1966 (see Grolle 1966b).

Apomarsupella verrucosa (W.E.Nicholson) Váňa, *Bryobrothera* 5: 227, 1999 (see Váňa 1999).

***Gymnomitrion papillosum* N.Kitag. et S.Hatt.**, *Bull. Univ. Mus. Univ. Tokyo* 8: 231, 1975 (see Hattori 1975). Type: NEPAL: Gosa-Banduke Pokhari, 1972, leg. *Iwatsuki* (NICH-311992, holotype). Syn. in Wu & Gao 2007.

Gymnomitrion Corda

***Cesius* Gray**, *Nat. Arr. Brit. Pl*. 1: 705, 1821 (see Gray 1821), *nom. rej*. Type: *Cesius concinnatus* (Lightf.) Gray (≡*Gymnomitrion concinnatum* (Lightf.) Corda). Note: Kuntze (1891) intended to change the spelling of the genus *Cesius* to *Cesiusa* to make it feminine. Grolle (1983) treated the latter as a validly (but illegitimate) genus, and not a spelling variant. We can not see that this is justified as Kuntze himself say that he is changing the spelling and thus treat it as an orthographic variant here.

****Cesius* subgen. *Eucesius* Lindb.**, *Finland 1885 (290) 13 Dec*.: 2, 1885 (see Lindberg 1885), *nom. inval.* (Art. 32.1.d; no description), "*Cesia* subgen. *Eucesia*". Cited taxon: *Cesius concinnatus* (Lightf.) Gray (≡*Gymnomitrion concinnatum* (Lightf.) Corda)

***Gymnomitrion* Corda**, *Naturalientausch* 12: 651, 1829 (see Corda 1829), *nom. conserv.* Type: *Gymnomitrion concinnatum* (Lightf.) Corda

Gymnomitrion subgen. *Gymnomitrion*, *J. Hattori Bot. Lab*. 26: 105, 1963 (see Kitagawa 1963).

Gymnomitrion sect. *Gymnomitrion*, *Trans. Brit. Bryol. Soc*. 5: 87, 1966 (see Grolle 1966b).

****Acolea* Dumort.**, *Syll. Jungerm. Europ*.: 76, 1831 (see Dumortier 1831), *nom. illeg.* (Art. 52.1, type of *Gymnomitrion* included). Type: *Acolea concinnata* (Lightf.) Dumort. (≡*Gymnomitrion concinnatum* (Lightf.) Corda) [lectotype according to Art. 7.5]

***Gymnomitrion* sect. I *Julacea* Gottsche, Lindenb. et Nees**, *Syn. Hepat*. 1: 2, 1844 (see Gottsche et al. 1844). Type: *Gymnomitrion* [lectotype to be selected from *G. concinnatum*, *G. corallioides*, *G. scariosum* and *G. adustum*]

***Gymnomitrion* sect. *Homocraspis* Lindb. ex Schiffn.**, *Hepat. (Engl.-Prantl*): 77, 1893 (see Schiffner 1893). Type: *Gymnomitrion varians* (Lindb.) Müll.Frib. (=*Gymnomitrion brevissimum* (Dumort.) Warnst.) [lectotype by Grolle 1976b].

**Cesius* subgen. *Homocraspis* Lindb., *Finland 1885 (290) 13 Dec*.: 2, 1885 (see Lindberg 1885), *nom. inval.* (Art. 32.1.d; no description), "*Cesia*".

Marsupella subgen. *Homocraspis* (Lindb. ex Schiffn.) Grolle, *Feddes Repert*. 87: 259, 1976 (see Grolle 1976b).

Marsupella sect. *Homocraspis* (Lindb. ex Schiffn.) Grolle, *J. Bryol*. 22: 119, 2000 (see Grolle & Long 2000).

****Gymnomitrion* sect. I *Typicae* Schiffn.**, *Hepat. (Engl.-Prantl*): 77, 1893 (see Schiffner 1893), *nom. inval.* (Art. 32.1.d; no description and type of *Gymnomitrion* included). Cited taxon: *Gymnomitrion concinnatum* (Lightf.) Corda

****Gymnomitrion* subgen. A *Eu-Gymnomitrion* Müll.Frib.**, *Rabenh. Krypt.-Fl., ed*. 2, 6 (7): 416, 1909 (see Müller 1909a), *nom. inval.* (Art. 32.1.d; no description and type of *Gymnomitrion* included). Cited taxon: *Gymnomitrion concinnatum* (Lightf.) Corda

****Marsupella* sect. *Adustae* Müll.Frib.**, *Hedwigia* 81: 113, 1942 (see Müller 1942), *nom. inval.* (Art. 32.1.d; no description). Cited taxon: *Marsupella adusta* (Nees) Spruce (≡*Gymnomitrion adustum* Nees)

***Dianthelia* R.M.Schust.**, *Bryologist* 52: 103, 1949 (see Schuster 1949). Type: *Dianthelia steerei* R.M.Schust. (=*Gymnomitrion laceratum* (Steph.) Horik.)

Gymnomitrion sect. *Dianthelia* (R.M.Schust.) R.M.Schust., *Hepat. Anthocerotae N. Amer*. 3: 122, 1974 (see Schuster 1974).

****Marsupella* sect. *Adustae* Müll.Frib.**, *Leberm. Eur*.: 758, 766, 1956 (see Müller 1956), *nom. inval.* (Art. 36.1; no Latin description). Cited taxon: *Marsupella adusta* (Nees) Spruce (≡*Gymnomitrion adustum* Nees)

***Gymnomitrion* subgen. *Archiogymnomitrion* N.Kitag.**, *J. Hattori Bot. Lab*. 26: 105, 1963 (see Kitagawa 1963). Type: *Gymnomitrion laceratum* (Steph.) Horik.

***Gymnomitrion* sect. *Crenarion* Grolle**, *Trans. Brit. Bryol. Soc*. 5: 87, 1966 (see Grolle 1966b). Type: *Gymnomitrion crenulatum* Gottsche ex Carrington

***Marsupella* subgen. *Neomarsupella* N.Kitag.**, *J. Hattori Bot. Lab*. 30: 201, 1967 (see Kitagawa 1967). Type: *Marsupella subintegra* S.W.Arnell (≡*Gymnomitrion subintegrum* (S.W.Arnell) Váňa)

Marsupella sect. *Neomarsupella* (N.Kitag.) Váňa, *Bryobrothera* 5: 226, 1999 (see Váňa 1999).

***Gymnomitrion* sect. *Corallioides* R.M.Schust.**, *Hepat. Anthocerotae N. Amer*. 3: 121, 1974 (see Schuster 1974). Type: *Gymnomitrion corallioides* Nees

***Marsupella* sect. *Alpinae* Grolle**, *Feddes Repert*. 87: 260, 1976 (see Grolle 1976b). Type: *Marsupella alpina* (Gottsche ex Husn.) Bernet (≡*Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.)

***Marsupella* subgen. *Micromarsupella* R.M.Schust.**, *J. Hattori Bot. Lab*. 80: 77, 1996 (see Schuster 1996a). Type: *Marsupella minutula* Hässel (≡*Gymnomitrion minutulum* (Hässel) Váňa)

***Marsupella* subgen. *Amphimarsupella* R.M.Schust.**, *Nova Hedwigia Beih*. 119: 551, 2002 (see Schuster 2002). Type: *Marsupella subhyalina* R.M.Schust. (=*Gymnomitrion bolivianum* (Steph.) Váňa)

Gymnomitrion adustum Nees (***)

Distribution:—Northern Europe, Central Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, Macaronesia, ?Siberia (reports from southern Siberia not verified), Russian Far East, Eastern Asia. Erroneously reported from Western Canada, Eastern Canada.

***Gymnomitrion adustum* Nees**, *Naturgesch. Eur. Leberm*. 1: 120, 1833 (see Nees 1833), "*Gymnomitrium*". Type: AUSTRIA: Salzburg: Untersberg, leg. *Funck* (STR, lectotype by Limpricht 1881a).

Sarcocyphos adustus (Nees) Spruce, *Ann. Mag. Nat. Hist. Ser.* 2, 3: 500, 1849 (see Spruce 1849), "*Sarcoscyphus*".

Cesius adustus (Nees) Carruth., *J. Bot*. 3: 300, 1865 (see Carruthers 1865).

**Nardia sparsifolia* β *adusta* (Nees) Lindb. ex Carrington, *Brit. Hep*. 1: 20, 1874 (see Carrington 1874), *nom. inval.* (Art. 34.1.c; sub *Nardia adusta* (Nees) Lindb.).

Nardia adusta (Nees) Carrington, *Brit. Hep*. 1: 20, 1874 (see Carrington 1874), *nom. superfluous*.

Acolea adusta (Nees) Trevis., *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 395, 1877 (see Trevisan 1877).

Marsupella adusta (Nees) Spruce, *Rev. Bryol*. 8: 98, 1881 (see Spruce 1881b).

Gymnomitrion adustum var. *adustum*, *Ann. Scott. Nat. Hist*. 13: 47, 1904 (see Macvicar 1904).

Cesius adustus var. *adustus*, *Bergens Mus. Skr. n.s*. 16: 68, 1934 (see Jørgensen 1934).

***Jungermannia concinnata* var. *minor* Nees**, *Naturgesch. Eur. Leberm*. 1: 120, 1833 (see Nees 1833), *nom. inval.* (Art. 34.1.c; sub *Gymnomitrium adustum* Nees). Cited material: EUROPE. *Syn. in Nees 1833.

***Jungermannia brunnea* Spreng. ex Nees**, *Naturgesch. Eur. Leberm*. 1: 120, 1833 (see Nees 1833), *nom. inval.* (Art. 34.1.c; sub *Gymnomitrium adustum* Nees). Cited material: "in Herb. Flotow". *Syn. in Nees 1833.

***Marsupella olivacea* Spruce**, *Rev. Bryol*. 8: 97, 1881 (see Spruce 1881b). Type: UK: England: Bow Fell, 1875 et 1878, leg. *Stabler*; CZECH REPUBLIC: Riesengebirge, leg. *Limpricht* (typification needed). Syn. in Schiffner 1903.

Gymnomitrion adustum var. *olivaceum* (Spruce) Macvicar, *Ann. Scott. Nat. Hist*. 13: 47, 1904 (see Macvicar 1904), "*olivacea*".

Gymnomitrion alpinum (Gottsche ex Husn.) Schiffn. (***)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Siberia, Russian Far East, China, Eastern Asia, Indian Subcontinent, Subarctic America, Western Canada, Northwestern USA.

***Sarcocyphos schismoides* Hampe ex Gottsche et Rabenh.**, *Hepat. Eur., Leberm*. 53-55: 535, 1872 (see Gottsche & Rabenhorst 1872), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus*". Cited material: SWITZERLAND: Vereina; AUSTRIA: Tirol: Neunerspitze. *Syn. in Müller 1909a.

***Sarcocyphos alpinus* Gottsche**, *Hepat. Eur., Leberm*. 53-55: 535, 1872 (see Gottsche & Rabenhorst 1872), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus*". Cited material: SWITZERLAND: Grimsel, 1862, leg. *Geheeb*. *Syn. in Grolle 1976b.

**Marsupella alpina* Gottsche ex Trevis., *Rendiconti Ist. Lomb. Sci. Lett*. 7: 784, 1874 (see Trevisan 1874), *nom. inval.* (Art. 32.1.d; no description).

**Nardia alpina* Gottsche ex Carrington, *Brit. Hep*. 1: 27, 1874 (see Carrington 1874), *nom. inval.* (Art. 32.1.d; no description).

***Sarcocyphos alpinus* Lindb.**, *Helsingfors Dagblad 1873 (353) 28 Dec*: 2, 1873 (see Lindberg 1873), *nom. inval.* (Art. 34.1.a; genus not accepted), "*Sarcoscyphus*". Cited material: NORWAY: Thrysildfjell (missing in H-SOL, cf. Grolle 1976b). *Syn. in Grolle 1976b.

***Sarcocyphos alpinus* Gottsche ex Husn.**, *Hepaticol. Gall*. 1: 13, 1875 (see Husnot 1875), "*Sarcoscyphus*". Type: SWITZERLAND: Grimsel, 1862, leg. *Geheeb* (lectotype by Grolle 1976b, cf. *Sarcocyphos alpinus* Gottsche).

Sarcocyphos alpinus f. *alpinus*, *Hepat. Eur., Leberm*. 62-64: 618, 1877 (see Gottsche & Rabenhorst 1877), "*Sarcoscyphus*".

Nardia alpina (Gottsche ex Husn.) Trevis., *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 401, 1877 (see Trevisan 1877).

Nardia alpina var. *alpina*, *Hepat. Brit. Exsicc. Fasc*. 2: 80, 1879 (see Carrington & Pearson 1879).

Sarcocyphos alpinus var. *alpinus*, *Rev. Bryol*. 12: 47, 1885 (see Bernet 1885), "*Sarcoscyphus*".

Cesius alpinus (Gottsche ex Husn.) Lindb., *Finland 1886 (80) 7 Apr.*: 2, 1886 (see Lindberg 1886), "*Cesia alpina*".

Marsupella alpina (Gottsche ex Husn.) Bernet, *Cat. Hép. Suisse*: 29, 1888 (see Bernet 1888).

Marsupella alpina var. *alpina*, *Moss Exch. Club Cat. Brit. Hepat*.: 6, 1897 (see Waddell 1897).

Gymnomitrion alpinum (Gottsche ex Husn.) Schiffn., *Österr. Bot. Z*. 53: 280, 1903 (see Schiffner 1903), "*Gymnomitrium*".

Gymnomitrion alpinum f. *alpinum*, *Rabenh. Krypt.-Fl., ed*. 2, 6 (7): 434, 1909 (see Müller 1909a).

Acolea alpina (Gottsche ex Husn.) C.Massal., *Atti Reale Ist. Veneto Sci. Lett. Arti*. 69: 121, 1909 (see Massalongo 1909).

Cesius alpinus var. *alpinus*, *Bergens Mus. Skr. n.s*. 16: 72, 1934 (see Jørgensen 1934).

Gymnomitrion alpinum var. *alpinum*, *Nuovo Giorn. Bot. Ital. n.s. (suppl*.) 41: 122, 1934 (see Zodda 1934).

Cesius alpinus f. *alpinus*, *Bergens Mus. Skr. n.s*. 16: 72, 1934 (see Jørgensen 1934).

***Sarcocyphos alpinus* f. *laxior* Gottsche et Rabenh.**, *Hepat. Eur., Leberm*. 62-64: n. 618, 1877 (see Gottsche & Rabenhorst 1877). Type: AUSTRIA: Tirol: Pinzthal, 1875, leg. *Arnold* (typification needed). *Syn. nov.*

Gymnomitrion alpinum f. *laxior* (Gottsche et Rabenh.) Schiffn., *Lotos* 58: 179, 1910 (see Schiffner 1910a), "*Gymnomitrium*".

Cesius alpinus f. *laxior* (Gottsche et Rabenh.) Kaal. ex Jørg., *Bergens Mus. Skr. n.s*. 16: 72, 1934 (see Jørgensen 1934).

***Nardia alpina* var. *laxior* Carrington et Pearson**, *Hepat. Brit. Exsicc. Fasc*. 2: n. 80, 1879 (see Carrington & Pearson 1879). Type: UK: Scotland: Loch-na-gar, 1876, leg. *J. & T. Sim* (typification needed). *Syn. nov.*

Marsupella alpina var. b *laxior* (Carrington et Pearson) Waddell, *Moss Exch. Club Cat. Brit. Hepat*.: 6, 1897 (see Waddell 1897).

***Sarcocyphos alpinus* var. *heterophyllus* Bernet**, *Rev. Bryol*. 12: 47, 1885 (see Bernet 1885), "*Sarcoscyphus*". Type: FRANCE: Haute-Savoie: au Brévent et aux Aiguilles-Rouges, leg. *Bernet* (typification needed). *Syn. nov.*

Marsupella alpina β* *heterophylla* (Bernet) Bernet, *Cat. Hép. Suisse*: 30, 1888 (see Bernet 1888).

Marsupella alpina var. *heterophylla* (Bernet) Boulay, *Musc. France* 2: 146, 1904 (see Boulay 1904).

Gymnomitrion alpinum f. *heterophyllum* (Bernet) Müll.Frib., *Rabenh. Krypt.-Fl., ed*. 2, 6 (8): 434, 1909 (see Müller 1909b), "*Gymnomitrium alpinum* f. *heterophylla*".

Cesius alpinus var. *heterophyllus* (Bernet) Jørg., *Bergens Mus. Skr. n.s*. 16: 72, 1934 (see Jørgensen 1934), "*Cesia alpina* var. *heterophylla*".

***Marsupella alpina* α *fusca* Bernet**, *Cat. Hép. Suisse*: 29, 1888 (see Bernet 1888). Type: FRANCE: Haute-Savoie: Aiguilles-Rouges, leg. *Payot* (typification needed). Syn. in Müller 1916.

***Marsupella alpina* γ *payotii* Bernet**, *Cat. Hép. Suisse*: 30, 1888 (see Bernet 1888), "*payoti*". Type: FRANCE: Haute-Savoie: Aiguilles-Rouges, leg. *Payot*; SWITZERLAND: Bel-Oiseau, leg. *Bernet* (typification needed). Syn. in Müller 1916.

Gymnomitrion alpinum var. *payotii* (Bernet) Zodda, *Nuovo Giorn. Bot. Ital. n.s. (suppl*.) 41: 122, 1934 (see Zodda 1934), "*Gymnomitrium alpinum* f. *payoti*".

***Marsupella alpina* β *procumbens* Bernet**, *Cat. Hép. Suisse*: 30, 1888 (see Bernet 1888). Type: FRANCE: Haute-Savoie: Aiguilles-Rouges, leg. *Payot & Bernet* (typification needed). Syn. in Müller 1916.

****Sarcocyphos pectinatus* Limpr. ex Payot**, *Rev. Bryol*. 15: 18, 1888 (see Payot 1888), *nom. inval.* (Art. 34.1.c; sub *Sarcoscyphos sphacelatus*), "*Sarcoscyphus*". Cited material: s. loc. cit. (cf. *Marsupella alpina* var. *payotii* Bernet). * *Syn. nov.*

***Cesius alpinus* f. *pygmaeus* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s*. 16: 72, 1934 (see Jørgensen 1934), "*Cesia alpina* f. *pygmaea*". Type: s. loc. cit. (typification needed). *Syn. nov.*

***Cesius alpinus* f. *gracilis* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s*. 16: 72, 1934 (see Jørgensen 1934), "*Cesia alpina*". Type: s. loc. cit. (typification needed). *Syn. nov.*

Gymnomitrion asperulatum R.M.Schust. ex Váňa (***)

Distribution:—Central America, Northern South America.

****Gymnomitrion asperulatum* R.M.Schust.**, *J. Hattori Bot. Lab*. 80: 106, 1996 (see Schuster 1996a), *nom. inval.* (Art. 37.7; herbarium not specified). Cited material: VENEZUELA: Mérida: Teleferico, leg. *Schuster 76-1429*.

***Gymnomitrion asperulatum* R.M.Schust. ex Váňa**, *Egri Tanárképzö Föisk. Tud. Közlem* 24: 114, 2003 (see Váňa 2003). Type: VENEZUELA: Mérida: Teleferico, leg. *Schuster 76-1449* (hb. Schuster, holotype). Note: cited "type" specimen (RMS 76-1449) does not have the same collecting number as published by Schuster 1996a (RMS 76-1429). We interpret this as a typographical error and regard the species validated by Váňa 2003.

Gymnomitrion atrofilum Váňa (***)

Distribution:—Western South America.

***Gymnomitrion atrofilum* Váňa**, *J. Hattori Bot. Lab*. 41: 411, 1976 (see Váňa 1976c). Type: COLOMBIA: Meta: Cerro Nevada de Sumpaz, 1973, leg. *Cleef* (PRC, holotype).

Gymnomitrion bolivianum (Steph.) Váňa (***)

Distribution:—Southern Africa, Mexico, Central America, Northern South America, Western South America.

***Sphenolobus laceratus* Steph.**, *Bull. Herb. Boiss. ser. 2, 2 (Spec. Hep*. 2): 173 (165), 1902 (see Stephani 1902). Type: COLOMBIA: Bogotá, leg. *Lindig* (G-11034, lectotype by Váňa 2003). Syn. in Váňa 2003.

**Gymnomitrion andinum* R.M.Schust., *J. Hattori Bot. Lab*. 80: 100, 1996 (see Schuster 1996a), *nom. illeg.* (Art. 53.1; non Herzog 1934).

Marsupella lacerata (Steph.) Váňa, *Egri Tanárképzö Föisk. Tud. Közlem* 24: 119, 2003 (see Váňa 2003).

***Marsupella cuspidata* Steph.**, *Biblioth. Bot*. 87: 181, 1916 (see Stephani 1916). Type: BOLIVIA: La Paz: Viloco, 1911, leg. *Herzog* (G-14539, lectotype by Váňa 1999). Note: syntype (Bolivia, Hochregion von Altamachi, 4000 m, VII.1911 *Herzog 3867*, G-14540, W) belong to *Triandrophyllum subtrifidum*. Syn. with *Gymnomitrion andinum* (Herzog) Herzog in Váňa 1999.

***Anastrophyllum bolivianum* Steph.**, *Biblioth. Bot*. 87: 186, 1916 (see Stephani 1916). Type: BOLIVIA: Yanakaka, 1913, leg. *Herzog* (G-17213, holotype).

Gymnomitrion bolivianum (Steph.) Váňa, *J. Hattori Bot. Lab*. 80: 225, 2010 (see Váňa et al. 2010).

***Acolea andina* Herzog**, *Biblioth. Bot*. 88: 27, 1921 (see Herzog 1921). Type: BOLIVIA: Cerro Incachacca, 1911, leg. *Herzog* (JE, holotype). Syn. (*nov.*) with *Sphenolobus laceratus* in Váňa 2003.

Gymnomitrion andinum (Herzog) Herzog, *Hedwigia* 74: 81, 1935 (see Herzog 1935).

***Marsupella trollii* Herzog**, *Hedwigia* 74: 82, 1935 (see Herzog 1935). Type: BOLIVIA: Maipiri, 1926, leg. *Troll* (JE, holotype). Syn. (*nov.*) with *Gymnomitrion andinum* (Herzog) Herzog in Váňa 1999.

***Marsupella capensis* S.W.Arnell**, *Bot. Not*. 110: 403, 1957 (see Arnell 1957b). Type: SOUTH AFRICA: Western Cape: Hex River Mts., leg. *Esterhuysen* (BOL, holotype). Syn. with *Gymnomitrion andinum* (Herzog) Herzog in Váňa 1999.

***Marsupella subhyalina* R.M.Schust.**, *J. Hattori Bot. Lab*. 80: 142, 1996 (see Schuster 1996a). Type: ECUADOR: N of Pifo-Papallacta Rd., leg. *Schuster* (F, holotype). Syn. (*nov.*) with *Gymnomitrion andinum* (Herzog) Herzog in Váňa 1999.

Gymnomitrion brevissimum (Dumort.) Warnst. (***)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, Siberia, Russian Far East, Caucasus, China, Indian Subcontinent, Subarctic America, Western Canada, Eastern Canada, Northwestern USA.

Jungermannia concinnata* **b *minor* Schleich., *Cat. Pl. Helv., ed*. 4: 44, 1821 (see Schleicher 1821), *nom. inval.* (Art. 32.1.d; no description). Cited material: SWITZERLAND: "Helvetia" [Grand St-Bernrad "*J. concinnata* très petite Hook. "in herb. Schleicher", LAU; cf. Grolle 1965b]. *Syn. in Grolle 1965b.

**Jungermannia concinnata* var. β *minor* Schleich. ex Dumort., *Syll. Jungerm. Europ*.: 76, 1831 (see Dumortier 1831), *nom. inval.* (Art. 32.1.c, 34.1.c; no description, sub *Acolea brevissima*).

Nardia sparsifolia var. β *minor* Schleich. ex Lindb., *Not. Sällsk. Fauna Fl. Fenn. Förh*. 13: 371, 1874 (see Lindberg 1874).

Sarcocyphos sparsifolius f. β *minor* (Schleich. ex Lindb.) Gottsche et Rabenh., *Hepat. Eur., Leberm*. 65-66: n. 648, 1879 (see Gottsche & Rabenhorst 1879).

Cesius minor (Schleich. ex Lindb.) Schleich. ex Kuntze, *Revis. Gen. Pl*. 2: 834, 1891 (see Kuntze 1891), "*Cesiusa*".

***Acolea brevissima* Dumort.**, *Syll. Jungerm. Europ*.: 76, 1831 (see Dumortier 1831). Type: SWITZERLAND: "Helvetia" [Grand St-Bernrad "*J. concinnata* très petite Hook. in herb. *Schleicher*" (LAU, lectotype by Váňa et al. 2010).

Nardia brevissima (Dumort.) Lindb., *Musci Scand*.: 9, 1879 (see Lindberg 1879).

Cesius brevissimus (Dumort.) Pearson, *Hepat. Brit. Isl*. 1: 399, 1901 (see Pearson 1901), "*Cesia brevissima*".

Gymnomitrion brevissimum (Dumort.) Warnst., *Hedwigia* 53: 196, 1913 (see Warnstorf 1913).

Marsupella brevissima (Dumort.) Grolle, *J. Jap. Bot*. 40: 213, 1965 (see Grolle 1965b).

***Gymnomitrion crassifolium* Carrington**, *Trans. & Proc. Bot. Soc. Edinburgh* 13: 461, 1879 (see Carrington 1879), "*Gymnomitrium*". Type: UK: Scotland: Carig Coynach, 1848, leg Black; Meal na Ptargachan, 1878, leg. *Wild* (typification needed). Syn. in Grolle 1965b.

Marsupella crassifolia (Carrington) Spruce, *Rev. Bryol*. 8: 98, 1881 (see Spruce 1881b).

Acolea crassifolia (Carrington) C.Massal. et Carestia, *Nuovo Giorn. Bot. Ital*. 14: 217, 1882 (see Massalongo & Carestia 1882).

Cesius crassifolius (Carrington) Lindb., *Meddel. Soc. Fauna Fl. Fenn*. 14 "1888": 68, 1887 (see Lindberg 1887a), "*Cesia crassifolia*".

Acolea crassifolia (Carrington) Steph., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 150 (11), 1901 (see Stephani 1901).

Cesius varians var. *crassifolius* (Carrington) Jørg., *Bergens Mus. Skr. n.s*. 16: 70, 1934 (see Jørgensen 1934), "*Cesia varians* var. *crassifolia*".

Marsupella varians var. *crassifolia* (Carrington) Jørg. ex S.W.Arnell, *Ill. Moss Fl. Fennosc. Hep*.: 234, 1956 (see Arnell 1956a).

***Nardia cochlearis* Lindb.**, *Musci Scand*.: 9, 1879 (see Lindberg 1879). Type: NORWAY: s. loc. (typification needed). Syn. with *Marsupella varians* (Lindb.) Müll.Frib. in Müller 1956.

Marsupella cochlearis (Lindb.) Spruce, *Rev. Bryol*. 8: 98, 1881 (see Spruce 1881b).

**Cesius cochlearis* (Lindb.) Lindb., *Finland 1885 (290) 13 Dec*.: 2, 1885 (see Lindberg 1885), *nom. inval.* (Art. 32.1.d; no description), "*Cesia*".

Cesius cochlearis (Lindb.) Lindb. ex Kaal., *Nyt Mag. Naturvidensk*. 33: 431, 1893 (see Kaalaas 1893), "*Cesia*".

Acolea cochlearis (Lindb.) Steph., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 144 (5), 1901 (see Stephani 1901).

Gymnomitrion cochleare (Lindb.) Müll.Frib., *Rabenh. Krypt.-Fl., ed*. 2, 6 (7): 431, 1909 (see Müller 1909a).

Cesius varians var. *cochlearis* (Lindb.) Jørg., *Bergens Mus. Skr. n.s*. 16: 71, 1934 (see Jørgensen 1934), "*Cesia*".

***Nardia varians* Lindb.**, *Musci Scand*.: 9, 1879 (see Lindberg 1879). Type: NORWAY: s. loc. (typification needed). Syn. in Grolle 1965b.

**Cesius varians* (Lindb.) Lindb., *Finland 1885 (290) 13 Dec*.: 2, 1885 (see Lindberg 1885), *nom. inval.* (Art. 32.1.d; no description), "*Cesia*".

Gymnomitrion varians (Lindb.) Schiffn., *Hepat. (Engl.-Prantl*): 77, 1893 (see Schiffner 1893), "*Gymnomitrium*".

Cesius varians (Lindb.) Lindb. ex Kaal., *Nyt Mag. Naturvidensk*. 33: 429, 1893 (see Kaalaas 1893), "*Cesia*".

Acolea varians (Lindb.) Steph., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 149 (10), 1901 (see Stephani 1901).

Gymnomitrion varians var. *varians*, *Lotos* 58: 214, 1910 (see Schiffner 1910b).

Cesius varians var. *varians*, *Bergens Mus. Skr. n.s*. 16: 70, 1934 (see Jørgensen 1934).

Marsupella varians (Lindb.) Müll.Frib., *Hedwigia* 81: 113, 1942 (see Müller 1942).

Marsupella varians var. *varians*, *Ill. Moss Fl. Fennosc. Hep*.: 234, 1956 (see Arnell 1956a).

***Sarcocyphos confertus* Limpr.**, *Jahresber. Schles. Ges. Vaterl. Cult*. 57 "1879": 312, 1880 (see Limpricht 1880), "*Sarcoscyphus*". Type: AUSTRIA: Steiermark: Stadl, 1878, leg. *Breidler*; Pinzgau, 1879, leg. *Breidler*; Schröder, 1875, leg. *Breidler*; Lungau, 1878, leg. *Breidler*; Schladming, 1878, leg. *Breidler* (typification needed). Syn. with *Marsupella varians* (Lindb.) Müll.Frib. in Müller 1954; syn. in Grolle 1965b.

Marsupella conferta (Limpr.) Spruce, *Rev. Bryol*. 8: 95, 1881 (see Spruce 1881b).

Gymnomitrion confertum (Limpr.) Limpr., *Flora* 64: 73, 1881 (see Limpricht 1881a).

Acolea conferta (Limpr.) C.Massal. et Carestia, *Nuovo Giorn. Bot. Ital*. 14: 216, 1882 (see Massalongo & Carestia 1882).

Cesius confertus (Limpr.) Pearson, *Hepat. Brit. Isl*. 1: 397, 1901 (see Pearson 1901), "*Cesia conferta*".

***Gymnomitrion ambiguum* Limpr. ex C.Massal. et Carestia**, *Nuovo Giorn. Bot. Ital*. 14: 218, 1882 (see Massalongo & Carestia 1882), "*Gymnomitrium*". Type: s. loc. cit. (typification needed). Syn. with *Gymnomitrion varians* (Lindb.) Schiffn. in Müller 1909; syn. in Grolle 1965b.

****Gymnomitrion ochraceum* Limpr. ex Müll.Frib.**, *Rabenh. Krypt.-Fl., ed*. 2, 6 (8): 428, 1909 (see Müller 1909b), *nom. inval.* (Art. 32.1.d, Art. 34.1.c; no description, sub *Gymnomitrion varians*), "*Gymnomitrium*". Cited material: s. loc. cit. *Syn. with *Gymnomitrion varians* (Lindb.) Schiffn. in Müller 1909a.

***Gymnomitrion varians* var. *majus* Schiffn.**, *Lotos* 58: 214, 1910 (see Schiffner 1910b). Type: AUSTRIA: Kärnten: Hochalmspitz, 1905, leg. *Loitlesberger* (typification needed). *Syn. nov.*

Gymnomitrion commutatum (Limpr.) Schiffn. (***)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Siberia, Russian Far East, China, Eastern Asia, Indian Subcontinent, Malesia, Subarctic America, Western Canada, Northwestern USA.

***Sarcocyphos commutatus* Limpr.**, *Jahresber. Schles. Ges. Vaterl. Cult*. 57 "1879": 314, 1880 (see Limpricht 1880), "*Sarcoscyphus*". Type: AUSTRIA: Tirol: Montefuner Tal, 1868, leg. *Jack* (BP, lectotype by Grolle 1976a).

Nardia commutata (Limpr.) C.Massal. et Carestia, *Nuovo Giorn. Bot. Ital*. 14: 219, 1882 (see Massalongo & Carestia 1882).

Marsupella commutata (Limpr.) Bernet, *Cat. Hép. Suisse*: 29, 1888 (see Bernet 1888).

Gymnomitrion commutatum (Limpr.) Schiffn., *Magyar Bot. Lapok* 13 "1914": 304, 1915 (see Schiffner 1915), "*Gymnomitrium*".

***Marsupella parvitexta* Steph.**, *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 165 (26), 1901 (see Stephani 1901). Type: JAPAN: Shikoku: Kochi, leg. *Inoue* (G-9470, holotype). Syn. in Hattori 1958.

***Gymnomitrion uncrenulatum* C.Gao et G.C.Zhang**, *Fl. Hepat. Chin. Boreali-Orient*.: 207, 1981 (see Gao & Zhang 1981). Type: CHINA: Jilin: Mt. Chanbaishan, 1963 leg. *Gao* (IFSBH, holotype). Syn. in Wu & Gao 2004.

****Marsupella commutata* var. *microfolia* G.C.Zhang**, *Fl. Hepat. Chin. Boreali-Orient*.: 207, 1981 (see Gao & Zhang 1981), *nom. inval*. (Art. 37.3; based on more than one gathering). Cited material: CHINA: Jilin: Chanbaishan, 1963, leg. *Gao* (IFSBH). *Syn. in Wu & Gao 2004.

Gymnomitrion concinnatum (Lightf.) Corda (***) Fig. 2.

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, Siberia, Russian Far East, Caucasus, Western Asia, China, Eastern Asia, Subarctic America, Western Canada, Eastern Canada, Northwestern USA, Northeastern USA, Southwestern USA, Southern South America. Erroneously reported from Indian Subcontinent, Australia, New Zealand.

***Jungermannia concinnata* Lightf.**, *Fl. Scot*. "1777": 786, 1778 (see Lightfoot 1778). Type: UK: Scotland: Ben Lawers, 2003, leg. *Long* (E, neotype).

Cesius concinnatus (Lightf.) Gray, *Nat. Arr. Brit. Pl*. 1: 705, 1821 (see Gray 1821).

**Schisma concinnatum* Dumort., *Commentat. Bot. (Dumortier*): 114, 1822 (see Dumortier 1822), *nom. inval*. (Art. 32.1.d; no description), "*concinnata*".

Gymnomitrion concinnatum (Lightf.) Corda, *Naturalientausch* 12: 651, 1829 (see Corda 1829).

Acolea concinnata (Lightf.) Dumort., *Syll. Jungerm. Europ*.: 76, 1831 (see Dumortier 1831).

Gymnomitrion concinnatum f. *concinnatum*, *Krypt.-Fl. Schlesien* "1876": 246, 1877 (see Limpricht 1877).

Gymnomitrion concinnatum var. *concinnatum*, *Jahresber. Schles. Ges. Vaterl. Cult*. 58 "1880": 186, 1881 (see Limpricht 1881c).

Marsupella concinnata (Lightf.) Spruce, *Rev. Bryol*. 8: 94, 1881 (see Spruce 1881b).

Acolea concinnata f. *concinnata*, *Cat. Hép. Suisse*: 24, 1888 (see Bernet 1888).

Acolea concinnata var. *concinnata*, *Cat. Hép. Suisse*: 24, 1888 (see Bernet 1888).

Cesius concinnatus var. *concinnatus*, *Bergens Mus. Skr. n.s.* 16: 63, 1934 (see Jørgensen 1934).

***Gymnomitrion concinnatum* β *procumbens* Nees**, *Naturgesch. Eur. Leberm*. 1: 115, 1833 (see Nees 1833), "*Gymnomitrium*". Type: POLAND: Dolnośląskie: Melzergrund, leg. *Nees* (typification needed). *Syn. nov.*

Gymnomitrion concinnatum f. *procumbens* (Nees) Limpr., *Krypt.-Fl. Schlesien* "1876": 246, 1877 (see Limpricht 1877).

Acolea concinnata β *procumbens* (Nees) C.Massal., *Annuario Reale Ist. Bot. Roma* 2 "1885": 92, 1886 (see Massalongo 1886).

Acolea concinnata f. *procumbens* (Nees) Bernet, *Cat. Hép. Suisse*: 24, 1888 (see Bernet 1888).

***Jungermannia gymnomitrioides* Nees**, *Naturgesch. Eur. Leberm*. 2: 52, 1836 (see Nees 1836). Type: AUSTRIA: Tirol: Tempeloche, leg. *Funck* (typification needed). Syn. in Carrington 1874.

***Gymnomitrion concinnatum* f. *viride* Limpr.**, *Krypt.-Fl. Schlesien* "1876": 246, 1877 (see Limpricht 1877), "*Gymnomitrium concinnatum* f. *viridis*". Type: POLAND/CZECH REPUBLIC, Giant Mts., loc. uncertain (typification needed). *Syn. nov.*

Acolea concinnata f. *viridis* (Limpr.) Bernet, *Cat. Hép. Suisse*: 24, 1888 (see Bernet 1888).

***Gymnomitrion concinnatum* f. *rufum* Limpr.**, *Krypt.-Fl. Schlesien* "1876": 246, 1877 (see Limpricht 1877), "*Gymnomitrium concinnatum* f. *rufa*". Type: POLAND/CZECH REPUBLIC, Giant Mts., loc. uncertain (typification needed). *Syn. nov.*

Acolea concinnata f. *rufa* (Limpr.) Bernet, *Cat. Hép. Suisse*: 24, 1888 (see Bernet 1888).

Cesius concinnatus var. *rufus* (Limpr.) Jørg., *Bergens Mus. Skr. n.s.* 16: 63, 1934 (see Jørgensen 1934), "*Cesia concinnata* var. *rufa*".

***Gymnomitrion concinnatum* var. *intermedium* Limpr.**, *Jahresber. Schles. Ges. Vaterl. Cult*. 58 "1880": 186, 1881 (see Limpricht 1881c), "*Gymnomitrium*". Type: EUROPE (typification needed). *Syn. nov.*

Acolea concinnata var. *intermedia* (Limpr.) Bernet, *Cat. Hép. Suisse*: 24, 1888 (see Bernet 1888).

Cesius concinnatus var. *intermedius* (Limpr.) Jørg., *Bergens Mus. Skr. n.s.* 16: 63, 1934 (see Jørgensen 1934), "*Cesia concinnata* var. *intermedia*".

***Gymnomitrion concinnatum* var. *reflexum* Müll.Frib.**, *Rabenh. Krypt.-Fl., ed*. 2, 6 (8): 421, 1909 (see Müller 1909b), "*Gymnomitrium concinnatum* var. *reflexa*". Type: AUSTRIA: Tirol: Leipziger Hütte, 1895, leg. *Kern* (typification needed). *Syn. nov.*

***Gymnomitrion concinnatum* f. *elongatum* Schiffn.**, *Lotos* 58: 182, 1910 (see Schiffner 1910a), "*Gymnomitrium concinnatum* f. *elongata*". Type: SWEDEN: Torne Lappmark: Nuolja, 1907, leg. *Nicholson* (typification needed). *Syn. nov.*

***Acolea breviloba* Steph.**, *Spec. Hepat. (Stephani)* 6: 77, 1917 (see Stephani 1917). Type: JAPAN: leg. *Faurie* (typification needed). Syn. in Kitagawa 1963.

Gymnomitrion brevilobum (Steph.) Horik., *Acta Phytotax. Geobot*. 13: 212, 1943 (see Horikawa 1943), "*Gymnomitrium*".

***Gymnomitrion concinnatum* f. *laxum* Meyl.**, *Beitr. Kryptogamenfl. Schweiz* 6(4): 125, 1924 (see Meylan 1924), "*laxa*". Type: SWITZERLAND (typification needed). *Syn. nov.*

***Cesius concinnatus* var. *argenteus* Jørg.**, *Bergens Mus. Skr. n.s*. 16: 64, 1934 (see Jørgensen 1934), "*Cesia concinnata* var. *argentea*". Type: NORWAY; Nordland: Øifjell, 1894 (typification needed). *Syn. nov.*

**Gymnomitrion concinnatum* var. *argenteum* (Jørg.) Müll.Frib., *Leberm. Eur.*: 798, 1956 (see Müller 1956), *nom. inval.* (Art. 33.4; no basionym cited).

***Cesius concinnatus* var. *bryhnii* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s*. 16: 63, 1934 (see Jørgensen 1934). Type: NORWAY: Aust-Agder: Raustheifjell (typification needed). *Syn. nov.*

**Gymnomitrion concinnatum* var. *bryhnii* (Kaal. ex Jørg.) Müll.Frib., *Leberm. Eur.*: 798, 1956 (see Müller 1956), *nom. inval.* (Art. 33.4; no basionym cited).

***Cesius concinnatus* var. *rufescens* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s*. 16: 63, 1934 (see Jørgensen 1934), "*Cesia concinnata* var. *rufescens*". Type: NORWAY: Nordland: Ørtfjell (typification needed). *Syn. nov.*

**Gymnomitrion concinnatum* var. *rufescens* (Kaal. ex Jørg.) Müll.Frib., *Leberm. Eur.*: 798, 1956 (see Müller 1956), *nom. inval.* (Art. 33.4; no basionym cited).

***Cesius concinnatus* var. *ambiguus* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s*. 16: 63, 1934 (see Jørgensen 1934), "*Cesia concinnata* var. *ambigua*". Type: NORWAY: Sogn og Fjordane: Førde; Troms: Fløifjell (typification needed). *Syn. nov.*

Gymnomitrion concinnatum var. *ambiguum* (Kaal. ex Jørg.) S.W.Arnell, *Ill. Moss Fl. Fennosc. Hep*.: 228, 1956 (see Arnell 1956a).

Gymnomitrion corallioides Nees (***)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, Siberia, Russian Far East, Caucasus, Mongolia, Eastern Asia, Subarctic America, Western Canada, Eastern Canada, Northwestern USA, Northeastern USA. Erroneously reported from China, Antarctic Continent.

***Gymnomitrion corallioides* Nees**, *Naturgesch. Eur. Leberm*. 1: 118, 1833 (see Nees 1833), "*Gymnomitrium*". Type: POLAND/CZECH REPUBLIC: Riesengebirge: Mädelsteine, leg. *Nees* (type location is a rock on the border between Poland and Czech Republic) (STR, lectotype by Grolle 1976b).

Acolea corallioides (Nees) Dumort., *Recueil Observ. Jungerm*.: 23, 1835 (see Dumortier 1835), "*coralloides*".

Cesius corallioides (Nees) Carruth., *J. Bot*. 3: 300, 1865 (see Carruthers 1865), "*Cesia coralloides*".

Acolea corallioides var. *corallioides*, *Herb. Mus. Fenn., ed. 2, Musci*: 1, 1894 (see Bomansson & Brotherus 1894).

Gymnomitrion corallioides var. *corallioides*, *J. Hattori Bot. Lab*. 4: 62, 1950 (see Hattori 1950).

Jungermannia concinnata* β *clavuligera* Nees, *Naturgesch. Eur. Leberm*. 1: 118, 1833 (see Nees 1833), *nom. inval.* (Art. 34.1.c; sub *Gymnomitrion coralloides*). Cited material: POLAND/CZECH REPUBLIC: Riesengebirge, Mädelsteinen, Mittagssteine. *Syn. (*nov.*) in Nees 1833.

Jungermannia concinnata* var. β *clavuligera* Nees ex Huebener, *Ann. Pharmacie (Heidelberg)* 7: 75, 1833 (see Hübener 1833), *nom. inval.* (Art. 32.1.d; no description). Cited material: s.loc.cit. Note: apparently based on the same specimen(s) as in Nees 1833. * *Syn. nov.*

Cesius corallioides* var. β *intermedius* Lindb., *Helsingfors Dagblad 1877 (43) 14 Feb*.: 2, 1877 (see Lindberg 1877a), *nom. inval.* (Art. 32.1.d; no description), "*Cesia corallioides* var. β *intermedia*". Cited material: FINLAND: Savonia borealis: Kuopio, leg. *Lackström* (H-SOL). * *Syn. nov.*

**Acolea corallioides* var. *intermedia* Bom. et Broth., *Herb. Mus. Fenn., ed. 2, Musci*: 3, 1894 (see Bomansson & Brotherus 1894), *nom. inval*. (Art. 32.1.c; no description (presumed basionym also without description)).

***Acolea corallioides* α *brevis* Bernet**, *Cat. Hép. Suisse*: 24, 1888 (see Bernet 1888), "*coralloides*". Type: SWITZERLAND: Cime du Bel-Oiseau, 1886, leg. *Bernet*; Grand St. Bernet, herb. *Schleicher* (typification needed). *Syn. nov.*

***Acolea corallioides* β *elongata* Bernet**, *Cat. Hép. Suisse*: 24, 1888 (see Bernet 1888), "*coralloides*". Type: SWITZERLAND: Grand St. Bernard, herb. *Schleicher* (typification needed). *Syn. nov.*

***Acolea fauriana* Steph.**, *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep.* 2): 147 (8), 1901 (see Stephani 1901). Type: JAPAN: Honshu: Tidesan, 1898, leg. *Faurie* (G-15025, holotype). Syn. in Kitagawa 1963.

Gymnomitrion faurianum (Steph.) Horik., *Acta Phytotax. Geobot*. 13: 212, 1943 (see Horikawa 1943), "*Gymnomitrium*".

Gymnomitrion corallioides var. *faurianum* (Steph.) S.Hatt., *J. Hattori Bot. Lab*. 4: 62, 1950 (see Hattori 1950).

***Lophozia ubayensis* Steph.**, *Spec. Hepat. (Stephani*) 6: 114, 1917 (see Stephani 1917). Type: JAPAN: Honshu: Ubaya, leg. *Faurie* (G-15397, holotype). Syn. in Kitagawa 1963.

****Gymnomitrion corallioides* var. *asperulum* S.Hatt.**, *J. Hattori Bot. Lab*. 4: 62, 1950 (see Hattori 1950), *nom. inval.* (Art. 34.1.c; sub *Gymnomitrion corallioides* var. *faurianum*). Cited material: JAPAN. *Syn. in Hattori 1950.

Gymnomitrion crenatilobum Grolle (***)

Distribution:—Indian Subcontinent.

***Gymnomitrion crenatilobum* Grolle**, *Khumbu Himal*: 278, 1966 (see Grolle 1966d). Type: NEPAL: Lobuche, 1962, leg. *Poelt* (M, holotype).

Gymnomitrion crenulatum Gottsche ex Carrington (***)

Distribution:—Northern Europe, Southwestern Europe. Erroneously reported from Eastern Europe, Siberia, China, Eastern Asia, Subarctic America, Western Canada, Subantarctic Islands.

***Gymnomitrion crenulatum* Gottsche ex Carrington**, *Trans. Bot. Soc. Edinburgh* 7: 444, 1863 (see Carrington 1863), "*Gymnomitrium*". Type: IRELAND: Killarney, leg. *Taylor* (MANCH [Hb. Carring. 6938/a], lectotype by Grolle 1966b).

Cesius crenulatus (Gottsche ex Carrington) Carruth., *J. Bot*. 3: 300, 1865 (see Carruthers 1865).

Acolea crenulata (Gottsche ex Carrington) Dumort., *Bull. Soc. Roy. Bot. Belgique* 13: 123, 1874 (see Dumortier 1874).

Gymnomitrion concinnatum b *crenulatum* (Gottsche ex Carrington) Limpr., *Krypt.-Fl. Schlesien* "1876": 246, 1877 (see Limpricht 1877), "*Gymnomitrium*". Note: non *sensu* Limpricht 1877.

Marsupella crenulata (Gottsche ex Carrington) Spruce, *Rev. Bryol*. 8: 101, 1881 (see Spruce 1881b).

Cesius crenulatus f. *crenulatus*, *Nyt. Mag. Naturvitensk.* 45: 114, 1907 (see Bryhn 1907), "*Cesia crenulata*".

Gymnomitrion crenulatum f. *crenulatum*, *Rabenh. Krypt.-Fl., ed*. 2, 6 (7): 425, 1909 (see Müller 1909a).

***Cesius crenulatus* f. *rufescens* Bryhn**, *Nyt. Mag. Naturvitensk*. 45: 114, 1907 (see Bryhn 1907), "*Cesia crenulata*". Type: NORWAY: Rogaland: Ekersund, leg. *Bryhn* (typification needed). *Syn. nov.*

Gymnomitrion crenulatum f. *rufescens* (Bryhn) Müll.Frib., *Rabenh. Krypt.-Fl., ed*. 2, 6 (7): 425, 1909 (see Müller 1909a).

Gymnomitrion incompletum (Gottsche) R.M.Schust. ex Váňa (**)

Distribution:—Malesia, Papuasia, Australia, New Zealand.

***Jungermannia incompleta* Gottsche**, *Linnaea* 28 "1856": 551, 1857 (see Gottsche 1857). Type: AUSTRALIA: New South Wales: Southern Alps, leg. *F. Müller* (G-14597, lectotype by Schuster 1966).

Sphenolobus incompletus (Gottsche) Steph., *Bull. Herb. Boiss. ser. 2, 2 (Spec. Hep.* 2): 173 (165), 1902 (see Stephani 1902).

**Gymnomitrion incompletum* (Gottsche) R.M.Schust., *Rev. Bryol. Lichénol*. 34: 279, 1966 (see Schuster 1966), *nom. inval.* (Art. 33.2; basionym not cited).

Gymnomitrion incompletum (Gottsche) R.M.Schust. ex Váňa, *J. Hattori Bot. Lab*. 40: 186, 1976 (see Váňa 1976b).

***Cesius cuspidatus* Berggr.**, *New Zealand Hepat.*: 1, 1898 (see Berggren 1898), "*Cesia cuspidata*". Type: NEW ZEALAND: South Island: Porter's Pass, 1874, leg. *Berggren* (LD, lectotype by Váňa 1976b). Note: accepted as *Gymnomitrion cuspidatum* by Schuster 2002 and Engel & Glenny 2008. Syn. (*nov.*) in Váňa 1976b.

Acolea cuspidata (Berggr.) Steph., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 146 (7), 1901 (see Stephani 1901).

Gymnomitrion cuspidatum (Berggr.) R.M.Schust., *J. Hattori Bot. Lab*. 26: 280, 1963 (see Schuster 1963).

****Gymnomitrion altissimum* R.M.Schust.**, *Taxon* 18: 69, 1969 (see Schuster 1969a), *nom. inval.* (Art. 32.1.d; no description). Cited material: PAPUA NEW GUINEA. *Syn. (*nov.*) in Váňa 1976b.

***Gymnomitrion laceratum* var. *borneense* N.Kitag.**, *Misc. Bryol. Lichenol*. 6: 74, 1973 (see Kitagawa 1973b). Type: MALAYSIA: Borneo, Sabah: Kinabalu, leg. *Kokawa & Hota* (OSA, holotype). Syn. in Váňa 1976a.

Gymnomitrion laceratum (Steph.) Horik. (***)

Distribution:—West-Central Tropical Africa, East Tropical Africa, Southern Africa, Western Indian Ocean, Siberia, China, Eastern Asia, Indian Subcontinent, Southeastern USA, Mexico, Northern South America, Western South America. Erroneously reported from Malesia.

***Acolea lacerata* Steph.**, *Spec. Hepat. (Stephani)* 6: 78, 1917 (see Stephani 1917). Type: JAPAN: Honshu: Kofu, 1903, leg. *Faurie* (G-1527, holotype).

Gymnomitrion laceratum (Steph.) Horik., *Acta Phytotax. Geobot*. 13: 212, 1943 (see Horikawa 1943), "Gymnomitrium".

Gymnomitrion laceratum var. *laceratum*, *Misc. Bryol. Lichenol*. 6: 74, 1973 (see Kitagawa 1973b).

***Dianthelia steerei* R.M.Schust.**, *Bryologist* 52: 105, 1949 (see Schuster 1949). Type: USA: Tennessee: Great Smoky Mountains, leg. *Steere* (herb. Schuster, holotype). Syn. in Arnell 1963.

**Gymnomitrion steerei* (R.M.Schust.) R.M.Schust., *Bryologist* 61: 44, 1958 (see Schuster 1958), *nom. inval.* (Art. 33.4; basionym not cited), "*Gymnomitrium*".

***Gymnomitrion elgonense* S.W.Arnell**, *Ark. Bot*. 3 (16): 532, 1956 (see Arnell 1956b). Type: KENYA: Elgon, leg. *Hedberg* (UPS, holotype). Syn. in Kitagawa 1963.

Gymnomitrion elgonense var. *elgonense*, *Ark. Bot*. 3 (16): 533, 1956 (see Arnell 1956b).

***Gymnomitrion elgonense* var. *squarrosum* S.W.Arnell**, *Ark. Bot*. 3 (16): 533, 1956 (see Arnell 1956b). Type: UGANDA: Ruwenzori, leg. *Hedberg* (UPS, holotype). Syn. in Kitagawa 1963.

****Gymnomitrion laceratum* var. *squarrosum* S.W.Arnell**, *Hepat. South Africa*: 309, 1963 (see Arnell 1963), *nom. inval.* (Art. 36.1, 37.1; no Latin description, no type indicated). Cited material: s. loc. cit. Note: probably identical with *G. elgonense* var. *squarrosum*. ** Syn. nov.*

Gymnomitrion minutulum (Hässel) Váňa (***)

Distribution:—Subantarctic Islands.

***Marsupella minutula* Hässel**, *J. Bryol*. 11: 123, 1980 (see Hässel 1980). Type: SOUTH GEORGIA: Bird Island, leg. *Greene* (AAS, holotype).

Gymnomitrion minutulum (Hässel) Váňa, *J. Hattori Bot. Lab*. 80: 225, 2010 (see Váňa et al. 2010).

Gymnomitrion moralesae Váňa (**)

Distribution:—Mexico, Central America.

***Gymnomitrion moralesae* Váňa**, *J. Hattori Bot. Lab*. 48: 230, 1980 (see Váňa 1980). Type: COSTA RICA: Alajeula, 1977, leg. *Griffin III & Araya* (FLAS, holotype).

Marsupella moralesae (Váňa) Váňa, *Egri Tanárképzö Föisk. Tud. Közlem* 24: 124, 2003 (see Váňa 2003).

Gymnomitrion mucronulatum (N.Kitag.) N.Kitag. (***)

Distribution:—Eastern Asia, Indian Subcontinent.

***Gymnomitrion concinnatum* var. *mucronulatum* N.Kitag.**, *Acta Phytotax. Geobot*. 18: 38, 1959 (see Kitagawa 1959). Type: JAPAN: Honshu: Mt. Kiso Komatagate, leg. *Shimizu* (NICH-56660, holotype).

Gymnomitrion mucronulatum (N.Kitag.) N.Kitag., *Acta Phytotax. Geobot*. 19: 53, 1962 (see).

Gymnomitrion mucrophorum R.M.Schust. (**)

Distribution:—Subarctic America.

***Gymnomitrion mucrophorum* R.M.Schust.**, *Bryologist* 98: 243, 1995 (see Schuster 1995). Type: USA: Alaska: Talkeetna Mts. leg. *Schuster* (F, holotype).

Gymnomitrion nigrum (Grolle et Váňa) Váňa (***)

Distribution:—Papuasia.

****Gymnomitrion nigrum* Wade et McVean**, *Res. School Pac. Stud. Dep. Biogeogr. Geomorph. Publ. BG*/1: 214, 1969 (see Wade & McVean 1969), *nom. inval.* (Art. 32.1.d, 36.1; no description). Cited material: PAPUA NEW GUINEA. *Syn. in Grolle & Piippo 1984.

***Marsupella nigra* Grolle et Váňa**, *J. Hattori Bot. Lab*. 40: 186, 1976 (see Váňa 1976b). Type: PAPUA NEW GUINEA: Simbu: Mt. Wilhelm, 1968, leg. *Van Zanten* (JE, holotype).

Gymnomitrion nigrum (Grolle et Váňa) Váňa, *J. Hattori Bot. Lab*. 80: 225, 2010 (see Váňa et al. 2010).

Gymnomitrion noguchianum S.Hatt. (***)

Distribution:—Eastern Asia.

***Gymnomitrion noguchianum* S.Hatt.**, *J. Jap. Bot*. 27: 55, 1952 (see Hattori 1952), "*Gymnomitrium*". Type: JAPAN: Kyushu: Mt. Daisen, 1947, leg. *Noguchi* (NICH-13067, holotype).

***Marsupella integrifolia* Steph. ex Bonner**, *Candollea* 14: 254, 1953 (see Bonner 1953b). Type: JAPAN: Honshu: Yamagata, 1904, leg. *Faurie* (G-15037, holotype). Syn. in Kitagawa 1963.

Gymnomitrion obtusilobum N.Kitag. (***)

Distribution:—Indian Subcontinent.

***Gymnomitrion obtusilobum* N.Kitag.**, *Bull. Univ. Mus. Univ. Tokyo* 8: 229, 1975 (see Hattori 1975). Type: NEPAL: Phujeng, 1972, leg. *Iwatsuki* (NICH-312677, holotype).

Gymnomitrion obtusum Lindb. (***)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, Caucasus, Indian Subcontinent, Subarctic America, Western Canada, Northwestern USA, Southwestern USA. Erroneously reported from Siberia, Australia, Southern South America.

***Gymnomitrion obtusum* Lindb.**, *Morgonbladet (Helsinki) 1877 (30) 6 Feb.*: 337, 1877 (see Lindberg 1877b), "*Gymnomitrium*". Type: SWEDEN: Ångermanland: Speckstaberget, 1873, leg. *Arnell* (H-SOL, lectotype by Grolle 1976b).

Cesius obtusus (Lindb.) Lindb., *Helsingfors Dagblad 1877 (43) 14 Feb.*: 2, 1877 (see Lindberg 1877a), "*Cesia obtusa*".

Gymnomitrion concinnatum var. *obtusum* (Lindb.) Limpr., *Jahresber. Schles. Ges. Vaterl. Cult*. 58 "1880": 186, 1881 (see Limpricht 1881c).

Acolea obtusa (Lindb.) C.Massal. et Carestia, *Nuovo Giorn. Bot. Ital*. 14: 218, 1882 (see Massalongo & Carestia 1882).

Cesius obtusus f. *obtusus*, *Bergens Mus. Skr. n.s*. 16: 64, 1934 (see Jørgensen 1934).

****Cesius obtusus* f. *argenteus* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s*. 16: 64, 1934 (see Jørgensen 1934), *nom. inval.* (Art. 26.1; type of species included ("artens type")), "*Cesia obtusa* f. *argentea*". Cited material: NORWAY: Nordland: Øifjell, 1894, leg. Kaalaas. * *Syn. nov.*

***Cesius obtusus* f. *alboviridis* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s*. 16: 64, 1934 (see Jørgensen 1934), "*Cesia obtusa*". Type: NORWAY: many localities cited (typification needed). *Syn. nov.*

****Cesius obtusus* var. *intermedius* Jørg.**, *Bergens Mus. Skr. n.s*. 16: 65, 1934 (see Jørgensen 1934), *nom. inval.* (Art. 32.1.d; no description), "*Cesia obtusa* var. *intermedia*". Cited material: NORWAY: Telemark: Tinn, 1879, leg. *Kaurin*. * *Syn. nov.*

Gymnomitrion pacificum Grolle (***)

Distribution:—Russian Far East, Eastern Asia, Subarctic America, Western Canada, Mexico.

***Gymnomitrion pacificum* Grolle**, *Trans. Brit. Bryol. Soc*. 5: 92, 1966 (see Grolle 1966b). Type: USA: Alaska: Evans I., 1948, leg. *Eyerdam* (S, holotype).

Gymnomitrion setaceum Grolle et Váňa (***)

Distribution:—Central America, Northern South America, Western South America.

***Gymnomitrion setaceum* Grolle et Váňa**, *J. Hattori Bot. Lab*. 41: 411, 1976 (see Váňa 1976c). Type: VENEZUELA: Mérida: Páramo de Mucuchies, 1969, leg. *Oberwinkler & Poelt* (JE, holotype).

Gymnomitrion sinense Müll.Frib. (***)

Distribution:—China, Indian Subcontinent.

***Gymnomitrion sinense* Müll.Frib.**, *Rev. Bryol. Lichénol*. 20: 176, 1951 (see Müller 1951b), "*Gymnomitrium*". Type: CHINA: Yunnan: Dokerla, 1915, leg. *Handel-Mazzetti* (S, lectotype by Váňa et al. 2010).

Gymnomitrion strictum (Berggr.) R.M.Schust. (**)

Distribution:—New Zealand.

***Cesius strictus* Berggr.**, *New Zealand Hepat*.: 2, 1898 (see Berggren 1898), "*Cesia stricta*". Type: NEW ZEALAND: North Island: Mt. Ruapehu, 1875, leg. *Berggren* (LD, holotype).

Acolea stricta (Berggr.) Steph., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 146 (7), 1901 (see Stephani 1901).

Gymnomitrion strictum (Berggr.) R.M.Schust., *J. Hattori Bot. Lab*. 26: 280, 1963 (see Schuster 1963).

Gymnomitrion strictum var. *inaequale* R.M.Schust. (**)

Distribution:—New Zealand.

***Gymnomitrion strictum* var. *inaequale* R.M.Schust.**, *J. Hattori Bot. Lab*. 80: 118, 1996 (see Schuster 1996a). Type: NEW ZEALAND: South I: Fiordland Natl. Park, leg. *Schuster* (F, holotype).

Gymnomitrion strictum var. *strictum* (**)

Distribution:—New Zealand.

Gymnomitrion strictum var. *strictum*, *J. Hattori Bot. Lab*. 80: 118, 1996 (see Schuster 1996a).

Gymnomitrion subintegrum (S.W.Arnell) Váňa (***)

Distribution:—West-Central Tropical Africa, East Tropical Africa, South Tropical Africa, Western Indian Ocean, Indian Subcontinent, Malesia, Papuasia.

***Marsupella subintegra* S.W.Arnell**, *Ark. Bot*. 3 (16): 545, 1956 (see Arnell 1956b). Type: UGANDA: Ruwenzori, Mijusi Valley, leg. *Hedberg 597* (UPS, holotype).

Gymnomitrion subintegrum (S.W.Arnell) Váňa, *J. Hattori Bot. Lab*. 80: 225, 2010 (see Váňa et al. 2010).

***Marsupella integra* N.Kitag.**, *J. Hattori Bot. Lab*. 30: 199, 1967 (see Kitagawa 1967). Type: MALAYSIA: Borneo, Sabah: Kinabalu, leg. *Mizutani* (NICH-252819, holotype). Syn. in Váňa 1985.

Gymnomitrion truncato-apiculatum Herzog (***)

Distribution:—Mexico, Central America, Northern South America, Western South America.

***Gymnomitrion truncato-apiculatum* Herzog**, *Hedwigia* 74: 81, 1935 (see Herzog 1935). Type: COLOMBIA: Bogota, 1929, leg. *Troll* (JE, holotype).

Marsupella truncato-apiculata (Herzog) Váňa, *Egri Tanárképzö Föisk. Tud. Közlem* 24: 124, 2003 (see Váňa 2003).

***Marsupella involuta* Váňa**, *J. Hattori Bot. Lab*. 41: 414, 1976 (see Váňa 1976c). Type: COLOMBIA: Arauca: Sierra Nevada de Cocuy, 1973, leg. *Cleef* (PRC, holotype). Syn. in Váňa 2003.

Herzogobryum Grolle

****Chondrophyllum* Herzog**, *Rev. Bryol. Lichénol*. 21: 46, 1952 (see Herzog 1952), *nom. illeg.* (Art. 53.1; non Kylin 1924, Rhodophyta). Type: *Chondrophyllum cucullatum* Herzog (=*Herzogobryum vermiculare* (Schiffn.) Grolle)

Herzogobryum Grolle, *Rev. Bryol. Lichénol*. 32 "1963": 160, 1964 (see Grolle 1964a).

Herzogobryum atrocapillum (Hook.f. et Taylor) Grolle (***)

Distribution:—Australia?, New Zealand, Subantarctic Islands, Antarctic Continent.

***Gymnomitrion atrocapillum* Hook.f. et Taylor**, *London J. Bot*. 5: 258, 1846 (see Taylor 1846). Type: KERGUELEN: Foul Haven, 1840, leg. *Hooker* (FH-TAYLOR, lectotype by Grolle 1966c).

Jungermannia atrocapilla (Hook.f. et Taylor) Hook.f. et Taylor, *Hooker, Bot. Antarct. Voy. I (Fl. Antarct*. 2): 423, 1847 (see Hooker 1847).

Cesius atrocapillus (Hook.f. et Taylor) Mitt., *Philos. Trans*. 168: 43, 1879 (see Mitten 1879), "*Cesia atricapilla*".

Acolea atrocapilla (Hook.f. et Taylor) Steph., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 143 (4), 1901 (see Stephani 1901).

Herzogobryum atrocapillum (Hook.f. et Taylor) Grolle, *Österr. Bot. Z*. 113: 228, 1966 (see Grolle 1966c).

***Gymnomitrion marionense* S.W.Arnell**, *Svensk Bot. Tidskr*. 47: 415, 1953 (see Arnell 1953a). Type: MARION ISLANDS: 1951, leg. *Rand 3288* (BOL, holotype). Syn. in Grolle 1966c.

***Marsupella austrogeorgica* Hässel**, *J. Bryol*. 11: 120, 1980 (see Hässel 1980). Type: SOUTH GEORGIA: Murphy Wall, 1961, leg. *Greene* (AAS, holotype). Syn. in Váňa 1999.

Herzogobryum filiforme R.M.Schust. (***)

Distribution:—New Zealand.

***Herzogobryum filiforme* R.M.Schust.**, *Phytologia* 45: 422, 1980 (see Schuster 1980). Type: NEW ZEALAND: South I: Mt. Cook Natl. Park, 1967, leg. *Schuster* (F, holotype).

Herzogobryum molle Grolle (***)

Distribution:—Southern South America, Subantarctic Islands.

***Herzogobryum molle* Grolle**, *Österr. Bot. Z*. 113: 226, 1966 (see Grolle 1966c). Type: ARGENTINA: Rio Negro: Parque Nac. Nahuelhuapi, 1936, leg. *Donat* (JE, holotype).

Herzogobryum teres (Carrington et Pearson) Grolle (***)

Distribution:—Australia, New Zealand, Southern South America, Subantarctic Islands, Antarctic Continent.

***Jungermannia teres* Carrington et Pearson**, *Pap. & Proc. Roy. Soc. Tasmania* 1887: 9, 1888 (see Carrington & Pearson 1888). Type: AUSTRALIA: Tasmania: Mt. Wellington, 1855, leg. *Bastow* (MANCH, holotype).

Jamesoniella teres (Carrington et Pearson) Steph., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 137 (100), 1901 (see Stephani 1901).

Herzogobryum teres (Carrington et Pearson) Grolle, *Österr. Bot. Z.* 113: 223, 1966 (see Grolle 1966c).

***Acolea magellanica* C.Massal. et Steph.**, *Atti Reale Ist. Veneto Sci. Lett. Arti*. 87: 237, 1928 (see Massalongo 1928). Type: ARGENTINA: Tierra del Fuego: Staten Island (typification needed). Syn. in Grolle 1966c.

***Jamesoniella inflexo-limbata* Herzog**, *Trans. & Proc. Roy. Soc. New Zealand* 68: 41, 1938 (see Herzog 1938). Type: NEW ZEALAND: North I: Tongariro, 1933, leg. *Moore 130* (JE, holotype). Syn. in Grolle 1971.

Herzogobryum vermiculare (Schiffn.) Grolle (***)

Distribution:—New Zealand, Southern South America, Subantarctic Islands.

***Gymnomitrion vermiculare* Schiffn.**, *Leberm., Forschungsr. Gazelle* 4 "1889": 2, 1890 (see Schiffner 1890). Type: KERGUELEN: Successful Harbour, 1874, leg. *Naumann* (FH, holotype).

Herzogobryum vermiculare (Schiffn.) Grolle, *J. Hattori Bot. Lab.* 28: 103, 1965 (see Grolle 1965a).

***Chondrophyllum cucullatum* Herzog**, *Rev. Bryol. Lichénol*. 21: 46, 1952 (see Herzog 1952). Type: CHILE: Valparaíso: Cerro-Tesoro Massiv, 1940, leg. *Schwabe* (JE, holotype). Syn. (*nov.*) in Grolle 1965a.

Herzogobryum cucullatum (Herzog) Grolle, *Rev. Bryol. Lichénol*. 32 "1963": 160, 1964 (see Grolle 1964b).

Marsupella Dumort.

***Marsupella* Dumort.**, *Commentat. Bot. (Dumortier)*: 114, 1822 (see Dumortier 1822). Type: *Marsupella emarginata* (Ehrh.) Dumort. [lectotype of residue in Dumortier 1831 fide Grolle 1983c]

Marsupella subgen. *Marsupella*, *Finland 1885 (290) 13 Dec.*: 2, 1885 (see Lindberg 1885).

Marsupella sect. *Marsupella*, *Hepat. Anthocerotae N. Amer.* 3: 102, 1974 (see Schuster 1974).

***Sarcocyphos* Corda**, *Naturalientausch* 12: 652, 1829 (see Corda 1829). Type: *Sarcocyphos ehrhardtii* Corda *nom. illeg.* (=*Marsupella emarginata* subsp. *emarginata* (Ehrh.))

****Marsupia* Dumort.**, *Syll. Jungerm. Europ.*: 77, 1831 (see Dumortier 1831), *nom. illeg.* (Art. 52.1; *Marsupella* included). Type: *Marsupia emarginata* (Ehrh.) Dumort. (≡*Marsupella emarginata* (Ehrh.) Dumort.)

***Nardia* subgen. *Hyalacme* Lindb.**, *Helsingfors Dagblad 1878 (38) 9 Feb.*: 2, 1878 (see Lindberg 1878c), "*Hyalocme*". Type: *Nardia condensata* (Ångstr. ex C.Hartm.) Lindb. (≡*Marsupella condensata* (Ångstr. ex C.Hartm.) Lindb. ex Kaal.)

Marsupella subgen. *Hyalacme* (Lindb.) Lindb., *Finland 1885 (290) 13 Dec.*: 2, 1885 (see Lindberg 1885).

Gymnomitrion sect. *Hyalacme* (Lindb.) Schljakov, *Novosti Sist. Nizsh. Rast.* 18: 100, 1981 (see).

***Nardiocalyx* Lindb. ex Jørg.**, *Bergens Mus. Skr. n.s.* 16: 74, 1934 (see Jørgensen 1934). Type: *Nardiocalyx apiculata* (Schiffn.) Jørg. (≡*Marsupella apiculata* Schiffn.)

**Cesius* A *Nardiocalyx* Lindb., *Musci Scand.*: 9, 1879 (see Lindberg 1879), *nom. inval.* (32.1.d; no description), "*Cesia*".

Gymnomitrion subgen. *Nardiocalyx* (Lindb. ex Jørg.) S.W.Arnell, *Ill. Moss Fl. Fennosc. Hep.*: 225, 1956 (see Arnell 1956a).

****Marsupella* sect. *Funckiorum* Müll.Frib.**, *Hedwigia* 81: 113, 1942 (see Müller 1942), *nom. inval.* (Art. 32.1.d; no description/"*Funckiae*). Cited taxon: *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

****Marsupella* sect. *Ustulatae* Müll.Frib.**, *Hedwigia* 81: 113, 1942 (see Müller 1942), *nom. inval.* (Art. 32.1.d; no description). Cited taxon: *Marsupella ustulata* Spruce (=*Marsupella sprucei* (Limpr.) Bernet)

****Marsupella* sect. *Emarginatae* Müll.Frib.**, *Hedwigia* 81: 113, 1942 (see Müller 1942), *nom. inval.* (Art. 32.1.d; no description). Cited taxon: *Marsupella emarginata* (Ehrh.) Dumort.

****Marsupella* sect. *Boeckiorum* Müll.Frib.**, *Hedwigia* 81: 113, 1942 (see Müller 1942), *nom. inval.* (Art. 32.1.d; no description), "*Boeckiae*". Cited taxon: *Marsupella boeckii* (Austin) Lindb. ex Kaal.

****Marsupella* sect. *Hyalacme* Müll.Frib.**, *Leberm. Eur.*: 759, 1956 (see Müller 1956), *nom. inval.* (Art. 32.1.d; no description, non subgen. *Hyalacme* Lindb.). Cited taxon: *Marsupella condensata* (Ångstr. ex C.Hartm.) Lindb. ex Kaal.

Marsupella subgen. *Pseudohyalacme* Schljakov, *Petjen. Mchi Sev. SSSR* 4: 96, 1981 (see Schljakov 1981).

***Marsupella* subgen. *Stolonicaulon* N.Kitag.**, *J. Hattori Bot. Lab.* 30: 203, 1967 (see Kitagawa 1967). Type: *Marsupella stoloniformis* N.Kitag.

Marsupella sect. *Stolonicaulon* (N.Kitag.) Váňa, *Bryobrothera* 5: 226, 1999 (see Váňa 1999).

***Marsupella* subgen. *Ustulatae* R.M.Schust.**, *Hepat. Anthocerotae N. Amer.* 3: 23, 1974 (see Schuster 1974). Type: *Marsupella ustulata* Spruce (=*Marsupella sprucei* (Limpr.) Bernet)

***Marsupella* sect. *Boeckiorum* R.M.Schust.**, *Hepat. Anthocerotae N. Amer.* 3: 102, 1974 (see Schuster 1974), "*Boeckiae*". Type: *Marsupella boeckii* (Austin) Lindb. ex Kaal.

***Marsupella* sect. *Funckiorum* R.M.Schust.**, *Hepat. Anthocerotae N. Amer.* 3: 45, 1974 (see Schuster 1974), "*Funckiae*". Type: *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

***Gymnomitrion* sect. *Apiculatae* R.M.Schust.**, *Hepat. Anthocerotae N. Amer.* 3: 122. 129, 1974 (see Schuster 1974). Type: *Gymnomitrion apiculatum* (Schiffn.) Müll.Frib. (≡*Marsupella apiculata* Schiffn.)

***Marsupella* subgen. *Nanocaulon* R.M.Schust.**, *J. Hattori Bot. Lab*. 80: 75, 1996 (see Schuster 1996a). Type: *Marsupella microphylla* R.M.Schust.

Marsupella alata S.Hatt. et N.Kitag. ex N.Kitag. (***)

Distribution:—Russian Far East, Eastern Asia.

***Marsupella alata* S.Hatt. et N.Kitag. ex N.Kitag.**, *Mem. Coll. Sci. Kyoto Imp. Univ., Ser. B, Biol*. 27: 79, 1960 (see Kitagawa 1960). Type: JAPAN: Honshu: Nagano, leg. *Inoue* (NICH-62717, holotype).

Marsupella andreaeoides (Lindb.) Müll.Frib. (***)

Distribution:—Northern Europe.

***Cesius andreaeoides* Lindb.**, *Meddel. Soc. Fauna Fl. Fenn*. 14 "1888": 68, 1887 (see Lindberg 1887a), "*Cesia*". Type: NORWAY: Hordaland: Eikenes, 1876, leg. *Wulfsberg* (H-SOL, holotype).

Acolea andreaeoides (Lindb.) Steph., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 147 (8), 1901 (see Stephani 1901).

Gymnomitrion andreaeoides (Lindb.) Müll.Frib., *Rabenh. Krypt.-Fl., ed*. 2, 6 (8): 427, 1909 (see Müller 1909b), "*Gymnomitrium*".

Cesius adustus var. *andreaeoides* (Lindb.) Jørg., *Bergens Mus. Skr. n.s*. 16: 69, 1934 (see Jørgensen 1934), "*Cesia adusta*".

Marsupella andreaeoides (Lindb.) Müll.Frib., *Feddes Repert. Spec. Nov. Regni Veget*. 54: 214, 1951 (see Müller 1951a).

Marsupella apiculata Schiffn. (***)

Distribution:—Northern Europe, Middle Europe, Southeastern Europe, Eastern Europe, Siberia, Russian Far East, Caucasus, China, Eastern Asia, Subarctic America, Western Canada, Eastern Canada.

***Marsupella apiculata* Schiffn.**, *Österr. Bot. Z.* 53: 249, 1903 (see Schiffner 1903). Type: EUROPE: 11 syntypes (typification needed).

Cesius apiculatus (Schiffn.) Bryhn, *Nyt. Mag. Naturvitensk*. 45: 114, 1907 (see Bryhn 1907), "*Cesia apiculata*".

Marsupella apiculata var. *apiculata*, *Lotos* 58: 217, 1910 (see Schiffner 1910b).

Nardiocalyx apiculata (Schiffn.) Jørg., *Bergens Mus. Skr. n.s*. 16: 74, 1934 (see Jørgensen 1934).

Gymnomitrion apiculatum (Schiffn.) Müll.Frib., *Hedwigia* 81: 113, 1942 (see Müller 1942), "*Gymnomitrium*".

***Marsupella apiculata* var. *gracilescens* Schiffn.**, *Lotos* 58: 217, 1910 (see Schiffner 1910b). Type: AUSTRIA: Tirol: Almindalpe, 1905, leg. *Handel-Mazzetti* (typification needed). *Syn. nov.*

****Gymnomitrion apiculatum* var. *laxior* S.W.Arnell**, *Ill. Moss Fl. Fennosc. Hep*.: 226, 1956 (see Arnell 1956a), *nom. inval.* (Art. 36.1; no Latin description). Cited material: SWEDEN: Härjedalen: Helagsfjället; Torne Lappmark: several localities. * *Syn. nov.*

Marsupella aquatica (Lindenb.) Schiffn. (***) Fig. 3.

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, Macaronesia, Siberia, Russian Far East, Caucasus, Subarctic America, Western Canada, Eastern Canada, Northwestern USA, Northeastern USA.

****Jungermannia rivularis* Sw. ex F.Weber et D.Mohr**, *Bot. Taschenb. (Weber*): 422, 1807 (see Weber & Mohr 1807), *nom. inval.* (Art. 34.1.a; not accepted by author). Cited material: SWEDEN: leg. *Swartz*. *Syn. (*nov.*)* in Nees 1833.

****Jungermannia emarginata* var. β *aquatica* Sw. ex Hook.**, *Brit. Jungerm*.: 27, 1812 (see Hooker 1812), *nom. inval.* (Art. 34.1.a; not accepted by author). Cited material: s. loc. cit. * *Syn. nov.*

***Jungermannia emarginata var. γ *rivularis* Sw. ex Steud.**, *Nomencl. Bot. (Steudel*) 2: 226, 1824 (see Steudel 1824), *nom. inval.* (Art. 32.1.d; no description). Cited material: s.loc.cit. * *Syn. nov.*

***Jungermannia emarginata* var. α *patens* Nees**, *Syll. Pl. Nov.* 1: 128, 1824 (see Hornschuch 1824). Type: s. loc. cit. *Syn. nov.*

***Jungermannia emarginata* β *aquatica* Lindenb.**, *Nova Acta Acad. Caes. Leop.-Carol. German. Nat. Cur. 14, suppl.*: 75, 1829 (see Lindenberg 1829). Type: EUROPE "*Jungerm. emarginata* Ehrh. var. *aquatica* comm. Schrader" (W-Lindenb. Hep. 160B, lectotype by Frahm 1993).

Marsupia emarginata var. β *aquatica* (Lindenb.) Dumort., *Syll. Jungerm. Europ*.: 78, 1831 (see Dumortier 1831).

Sarcocyphos ehrhardtii β *aquaticus* (Lindenb.) Nees, *Naturgesch. Eur. Leberm.* 1: 125, 1833 (see Nees 1833), "*Sarcoscyphus ehrharti* β *aquatica*".

Sarcocyphos emarginatus var. *aquaticus* (Lindenb.) Austin, *Hepat. Bor.-Amer. Exsicc*.: 3, 1873 (see Austin 1873), "*Sarcoscyphus*".

Nardia emarginata β *aquatica* (Lindenb.) Carrington, *Brit. Hep*. 1: 14, 1874 (see Carrington 1874).

Marsupella emarginata var. β *aquatica* (Lindenb.) Dumort., *Bull. Soc. Roy. Bot. Belgique* 13: 126, 1874 (see Dumortier 1874).

Marsupella emarginata α *aquatica* (Lindenb.) Bernet, *Cat. Hép. Suisse*: 27, 1888 (see Bernet 1888).

Sarcocyphos aquaticus (Lindenb.) Breidl., *Mitt. Naturwiss. Vereins Steiermark* 30: 286, 1894 (see Breidler 1894), "*Sarcoscyphus*".

Marsupella aquatica (Lindenb.) Schiffn., *Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag* 44: 218, 1896 (see Schiffner 1896).

Marsupella aquatica var. *aquatica*, *Meddel. Grønland* 30: 310, 1906 (see Jensen 1906b).

Marsupella emarginata subsp. *aquatica* (Lindenb.) Meyl., *Beitr. Kryptogamenfl. Schweiz* 6(4): 136, 1924 (see Meylan 1924).

Marsupella aquatica f. *aquatica*, *Petjen. Mchi Sev. SSSR* 4: 85, 1981 (see Schljakov 1981).

***Jungermannia rivularis* Sw. ex Nees**, *Naturgesch. Eur. Leberm*. 1: 125, 1833 (see Nees 1833), *nom. inval.* (Art. 34.1.c; sub *Sarcoscyphus ehrharti* β *aquatica* (Lindenb.) Nees). Cited material: s. loc. cit. *Syn. in Nees 1833.

***Jungermannia emarginata* var. γ *rivularis* Sw. ex Huebener**, *Hepaticol. Germ*.: 124, 1834 (see Hübener 1834), *nom. illeg.* (Art. 52.1; the earlier *Jungermannia emarginata* β *aquatica* Lindenb. 1829 included). Type: GERMANY: Harz; Bayern: Fichtelgebirge; FRANCE: Vogesen; POLAND/CZECH REPUBLIC: Sudeten (typification needed). Syn. (*nov.*) in Hübener 1834.

***Sarcocyphos ehrhardtii* var. β *rivularis* Sw. ex De Not.**, *Mem. Reale Accad. Sci. Torino, ser.* 2, 18 "1859": 461, 1858 (see De Notaris 1858), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus ehrharti*". Cited material: s.loc.spec. * *Syn. nov.*

***Jungermannia aquatica* "Schrad." ex Carringt.**, *Brit. Hep*. 1: 14, 1874 (see Carrington 1874), *nom. inval.* (Art. 34.1.c; sub. *Nardia emarginata* β *aquatica* (Lindenb.) Carrington 1874). Cited material: GERMANY. *Syn. in Carrington 1874.

***Nardia emarginata* α *major* Carrington**, *Brit. Hep*. 1: 14, 1874 (see Carrington 1874). Type: s.loc.spec. (typification needed). Note: The earlier *Jungermannia emarginata* β *grandis* Nees ex Huebener 1834 is included in the original publication but as they are treated as synonyms to different species here, Art. 52.3 is applicable and this taxon name thus legitimate. Syn. in Schuster 1974.

Sarcocyphos emarginatus var. *major* (Carrington) Husn., *Hepaticol. Gall*. 1: 12, 1875 (see Husnot 1875), "*Sarcoscyphus*".

***Sarcocyphos ehrhardtii* f. *purpureo-brunneus* Nees ex Limpr.**, *Krypt.-Fl. Schlesien* "1876": 248, 1877 (see Limpricht 1877), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus Ehrharti*". Cited material: s. loc. cit. "in Hrb. v. Fw (von Flotow)". * *Syn. nov.*

***Sarcocyphos ehrhardtii* f. α *fusco-purpureus* Nees ex Limpr.**, *Krypt.-Fl. Schlesien* "1876": 248, 1877 (see Limpricht 1877), *nom. inval*. (Art. 32.1.d; no description), "*Sarcoscyphus Ehrharti*". Cited material: s. loc. cit., "in herb. v. Fw". * *Syn. nov.*

***Sarcocyphos ehrhardtii* var. *procerus* Gottsche ex Limpr.**, *Krypt.-Fl. Schlesien* "1876": 248, 1877 (see Limpricht 1877), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus Ehrharti*". Cited material: s. loc. cit. * *Syn. nov*.

***Nardia emarginata* β *elongata* C.Massal. et Carestia**, *Nuovo Giorn. Bot. Ital*. 12: 312, 1880 (see Massalongo & Carestia 1880). Type: ITALY: Trentino-Alto Adige: Valpoiana (typification needed). Syn. in Schiffner 1901.

***Sarcocyphos emarginatus* var. *gracilis* Payot**, *Rev. Bryol*. 15: 18, 1888 (see Payot 1888), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus*". Cited material: FRANCE: Haute-Savoie: Chamonix. * *Syn. nov.*

***Marsupella aquatica* var. *gracilis* C.E.O.Jensen**, *Meddel. Grønland* 30: 310, 1906 (see Jensen 1906b). Type: GREENLAND: Tasiusak, leg. *Kruuse* (typification needed). *Syn. nov.*

****Marsupella aquatica* f. *viridis* Arnell et C.E.O.Jensen**, *Naturwiss. Untersuch. Sarekgeb. Schwed.-Lappl. 3, Bot.*: 118, 1907 (see Arnell & Jensen 1907), *nom. inval.* (Art. 32.1.d; no description). Cited material: SWEDEN: Västergötland: Öglunda, leg. *Arvén*; Småland: Hesslåsdam & Skutugatu, leg. *Tolf*; Långaryd, leg. *Arvén*; Ångermanland: Gådeåberget, leg. *Arnell*. * *Syn. nov.*

****Marsupella aquatica* f. *nigra* Arnell et C.E.O.Jensen**, *Naturwiss. Untersuch. Sarekgeb. Schwed.-Lappl. 3, Bot.*: 118, 1907 (see Arnell & Jensen 1907), *nom. inval.* (Art. 32.1.d; no description). Cited material: SWEDEN: Småland: Burseryd, leg. *Seth*; Gästrikland: Hamrånge, Lössnarn, leg. *Arnell*; Ångermanland: Säbrå, leg. *Arnell*; Torne Lappmark: Nagerolka, leg. *Ekstrand*. * *Syn. nov.*

****Marsupella aquatica* f. *obscura* Arnell et C.E.O.Jensen**, *Naturwiss. Untersuch. Sarekgeb. Schwed.-Lappl. 3, Bot.*: 118, 1907 (see Arnell & Jensen 1907), *nom. inval.* (Art. 32.1.d; no description). Cited material: SWEDEN: Östergötland: Krokek, leg. *Mosén*; Ångermanland: Hernön, leg. *Arnell*. * *Syn. nov.*

****Marsupella aquatica* f. *rubescens* Arnell et C.E.O.Jensen**, *Naturwiss. Untersuch. Sarekgeb. Schwed.-Lappl. 3, Bot.*: 118, 1907 (see Arnell & Jensen 1907), *nom. inval.* (Art. 32.1.d; no description). Cited material: SWEDEN: Ångermanland: Gådeåberget, leg. *Arnell*. * *Syn. nov.*

***Marsupella pearsonii* var. *revoluta* Schiffn.**, *Lotos* 58: 253, 1910 (see Schiffner 1910d). Type: FRANCE: Haute-Garonne: Bagnères-de-Luchon, 1903, leg. *Müller* (typification needed). *Syn. nov.*

***Marsupella emarginata* f. *mutabilis* Jørg.**, *Bergens Mus. Skr. n.s.* 16: 77, 1934 (see Jørgensen 1934). Type: NORWAY: Hordaland: Granvin (typification needed). Syn. (*nov.*) in Jørgensen 1934.

****Marsupella aquatica* var. *submersa* Arnell ex Schiffn.**, *Krit. Bemerk. Eur. Lebermoose* 27: 7, 1941 (see Schiffner 1941), *nom. inval.* (Art. 36.1; no Latin description). Cited material: SWEDEN: Torne Lappmark: Kättefjäll, 1910, leg. *Jäderholm*. * *Syn. nov.*

Marsupella arctica (Berggr.) Bryhn et Kaal. (***)

Distribution:—Northern Europe, Siberia, Russian Far East, China, Subarctic America, Eastern Canada.

***Sarcocyphos emarginatus* var. *arcticus* Berggr.**, *Kungl. Svenska Vetenskapsakad. Handl*. 13 (7): 96, 1875 (see Berggren 1875), "*Sarcoscyphus*". Type: NORWAY: Spitzbergen, Smeerensberg, 1868, leg. *Berggren* (C, LD, S, syntypes fide Grolle 1976b); Kobbe Bay, leg. Berggren (typification needed).

Marsupella arctica (Berggr.) Bryhn et Kaal., *Rep. Second Norweg. Arctic Exped.* 11: 26, 1906 (see Bryhn 1906).

Marsupella emarginata var. *arctica* (Berggr.) Frye et L.Clark, *Univ. Wash. Publ. Biol*. 6 "1943": 232, 1944 (see Frye & Clark 1944).

***Marsupella groenlandica* C.E.O.Jensen**, *Meddel. Grønland* 30: 291, 1906 (see Jensen 1906a). Type: GREENLAND: Disco, 1898, leg. *Porsild*; Hurry Inlet, 1900, leg. *Kruuse* (typification needed). Syn. in Müller 1956.

Marsupella boeckii (Austin) Lindb. ex Kaal. (***)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, Siberia, Russian Far East, Eastern Asia, Indian Subcontinent, Subarctic America, Western Canada, Eastern Canada, Northeastern USA. Erroneously reported from East Tropical Africa, Antarctic Continent.

***Sarcocyphos boeckii* Austin**, *Bull. Torrey Bot. Club* 3: 9, 1872 (see Austin 1872), "*Sarcoscyphus*". Type: NORWAY: "Norwegian Alps", 1869, leg. *Boeck* (MANCH, holotype).

Nardia boeckii (Austin) Lindb., *Musci Scand.*: 9, 1879 (see Lindberg 1879).

Marsupella boeckii (Austin) Lindb. ex Kaal., *Nyt Mag. Naturvidensk.* 33: 409, 1893 (see Kaalaas 1893).

Marsupella boeckii var. *boeckii*, *Naturwiss. Untersuch. Sarekgeb. Schwed.-Lappl. 3, Bot.*: 121, 1907 (see Arnell & Jensen 1907).

***Jungermannia divaricata* var. *latifolia* Lindb. ex Norrl.**, *Bot. Not.* 1873: 145, 1873 (see Norrlin 1873). Type: FINLAND: Lapponia enontekiensis: "Kilpisjärvitrakten", 1867, leg. *Norrlin* (H-SOL-2527003, lectotype by Váňa et al. 2010). Syn. in Müller 1909a.

Marsupella boeckii var. *latifolia* (Lindb. ex Norrl.) Kaal., *Bergens Mus. Skr. n.s.* 16: 87, 1934 (see Jørgensen 1934).

**Cephalozia divaricata* var. *latifolia* (Lindb. ex Norrl.) Lindb., *Leberm. Eur.*: 789, 1956 (see Müller 1956), *nom. inval.* (Art. 34.1.c; sub *Marsupella boeckii*).

***Nardia filiformis* Lindb.**, *Helsingfors Dagblad 1878 (315) 18 Nov.*: 2, 1878 (see Lindberg 1878a). Type: FINLAND: Lapponia enontekiensis: Kilpisjärvi, leg. *Norrlin*; Kuusamo, leg. *Sillén*; RUSSIA: Kola peninsula, leg. *Nylander* (typification needed). Syn. in Müller 1909a.

**Marsupella filiformis* (Lindb.) Lindb., *Finland 1885 (290) 13 Dec.*: 2, 1885 (see Lindberg 1885), *nom. inval.* (Art. 32.1.d; no description).

Marsupella filiformis (Lindb.) Lindb. ex Kaal., *Nyt Mag. Naturvidensk*. 33: 411, 1893 (see Kaalaas 1893).

Sarcocyphos filiformis (Lindb.) Warnst., *Hedwigia* 53: 197, 1913 (see Warnstorf 1913), "*Sarcoscyphus*".

***Nardia intricata* Lindb.**, *Helsingfors Dagblad 1878 (84) 28 Mar.*: 2, 1878 (see Lindberg 1878b). Type: FINLAND: Lapponia kittilensis: Pallastunturi, leg. *Hjelt & Hunt* (H-SOL, holotype). Syn. (*nov.*) in Müller 1909b.

Marsupella intricata (Lindb.) Steph., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 159 (20), 1901 (see Stephani 1901).

Marsupella boeckii var. *intricata* (Lindb.) Arnell et C.E.O.Jensen, *Naturwiss. Untersuch. Sarekgeb. Schwed.-Lappl. 3, Bot*.: 122, 1907 (see Arnell & Jensen 1907).

Sarcocyphos intricatus (Lindb.) Warnst., *Hedwigia* 53: 197, 1913 (see Warnstorf 1913), "*Sarcoscyphus*".

***Jungermannia nevicensis* Carrington**, *Trans. & Proc. Bot. Soc. Edinburgh* 13: 464, 1879 (see Carrington 1879). Type: UK: Scotland: Ben Nevis, 1875, leg. *Whitehead* (typification needed). Syn. in Müller 1909b.

Nardia nevicensis (Carrington) C.Massal. et Carestia, *Nuovo Giorn. Bot. Ital*. 14: 221, 1882 (see Massalongo & Carestia 1882).

Hygrobiella nevicensis (Carrington) Spruce, *Cephalozia*: 77, 1882 (see Spruce 1882).

Marsupella nevicensis (Carrington) Pearson, *Rev. Bryol*. 20: 64, 1893 (see Pearson 1893).

Cephalozia nevicensis (Carrington) C.Massal., *Malpighia* 21: 336 (48), 1907 (see Massalongo 1907).

Marsupella nevicensis f. *nevicensis*, *Rabenh. Krypt.-Fl., ed*. 2, 6 (8): 463, 1909 (see Müller 1909b).

Marsupella boeckii var. *nevicensis* (Carrington) Kaal. ex Jørg., *Bergens Mus. Skr. n.s*. 16: 87, 1934 (see Jørgensen 1934).

***Sarcocyphos capillaris* Limpr.**, *Jahresber. Schles. Ges. Vaterl. Cult*. 58 "1880": 182, 1881 (see Limpricht 1881b), "*Sarcoscyphus*". Type: AUSTRIA: Kärnten: Malta, 1880, leg. *Breidler*; "Bertelmann", 1880 leg. *Breidler* (typification needed). Syn. in Müller 1909b.

Sarcocyphos capillaris var. *capillaris*, *Jahresber. Schles. Ges. Vaterl. Cult*. 58 "1880": 182, 1881 (see Limpricht 1881b), "*Sarcoscyphus*".

Nardia capillaris (Limpr.) C.Massal. et Carestia, *Nuovo Giorn. Bot. Ital*. 14: 220, 1882 (see Massalongo & Carestia 1882).

Marsupella capillaris (Limpr.) Bernet, *Cat. Hép. Suisse*: 33, 1888 (see Bernet 1888).

***Sarcocyphos capillaris* var. β *irriguus* Limpr.**, *Jahresber. Schles. Ges. Vaterl. Cult*. 58 "1880": 182, 1881 (see Limpricht 1881b), "*Sarcoscyphus*". Type: AUSTRIA: Kärnten: Maltathale, 1880, leg. *Breidler* (BP, holotype). *Syn. nov.*

Marsupella nevicensis f. *irrigua* (Limpr.) Müll.Frib., *Rabenh. Krypt.-Fl., ed*. 2, 6 (8): 463, 1909 (see Müller 1909b).

****Nardia latifolia* Lindb.**, *Morgonbladet (Helsinki) 1882 (288) 11 Dec.*: 3, 1882 (see Lindberg 1882), *nom. inval.* (Art. 32.1.d; no description). Cited material: NORWAY: Sør-Trøndelag: Knudshø, 1882, leg. *Lindberg* (H-SOL-2530003). *Syn. in Müller 1909b.

****Marsupella latifolia* Lindb.**, *Finland 1885 (290) 13 Dec.*: 2, 1885 (see Lindberg 1885), *nom. inval.* (Art. 32.1.d; no description). Cited material: s. loc. cit. * *Syn. nov.*

****Marsupella boeckii* Lindb.**, *Finland 1885 (290) 13 Dec.*: 2, 1885 (see Lindberg 1885), *nom. inval.* (Art. 32.1.d; no description). Cited material: s. loc. cit. * *Syn. nov.*

***Marsupella lapponica* Limpr. ex Loitl.**, *Ann. Naturhist. Mus. Wien* 13: 192, 1898 (see Loitlesberger 1898). Type: ROMANIA: Negoikamme, 1897, leg. *Loitlesberger* (BP, holotype). Syn. in Müller 1909b.

****Sarcocyphos lapponicus* Limpr. ex Loitl.**, *Ann. Naturhist. Mus. Wien* 13: 192, 1898 (see Loitlesberger 1898), *nom. inval.* (Art. 34.1.c; sub *Marsupella lapponica*), "*Sarcoscyphus*". Cited material: FENNOSCANDIA: Lapland, leg. *Kaurin*. *Syn. (*nov.*) in Müller 1909b.

***Marsupella boeckii* var. *incrassata* Arnell et C.E.O.Jensen**, *Naturwiss. Untersuch. Sarekgeb. Schwed.-Lappl. 3, Bot*.: 121, 1907 (see Arnell & Jensen 1907). Type: SWEDEN: Lule Lappmark: Sarvatjåkko (typification needed). *Syn. nov.*

Marsupella bolanderi (Austin) Underw. (***)

Distribution:—Northwestern USA, Southwestern USA.

***Sarcocyphos bolanderi* Austin**, *Bull. Torrey Bot. Club* 3: 9, 1872 (see Austin 1872), "*Sarcoscyphus*". Type: USA: California: "in the mountains", 1865, leg. *Bolander* (typification needed).

Nardia bolanderi (Austin) Underw., *Bull. Illinois State Lab. Nat. Hist*. 2: 113, 1884 (see Underwood 1884).

Marsupella bolanderi (Austin) Underw., *Zoe* 1 "1890": 365, 1891 (see Underwood 1891).

Marsupella condensata (Ångstr. ex C.Hartm.) Lindb. ex Kaal. (***)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, Siberia, Russian Far East, Caucasus, China, Subarctic America, Western Canada, Eastern Canada, Northwestern USA.

***Gymnomitrion condensatum* Ångstr. ex C.Hartm.**, *Handb. Skand. Fl., ed*. 10: 128, 1871 (see Hartman 1871), "*Gymnomitrium*". Type: SWEDEN: Lycksele Lappmark: Laxfjället, leg. *Ångström* (S, holotype).

Cesius condensatus (Ångstr. ex C.Hartm.) Lindb., *Musci Scand*.: 9, 1879 (see Lindberg 1879), "*Cesia condensata*".

Nardia condensata (Ångstr. ex C.Hartm.) Lindb., *Meddel. Soc. Fauna Fl. Fenn*. 6: 192, 1881 (see Lindberg 1881).

Marsupella condensata (Ångstr. ex C.Hartm.) Lindb. ex Kaal., *Nyt Mag. Naturvidensk*. 33: 420, 1893 (see Kaalaas 1893).

Marsupella condensata f. *condensata*, *Bergens Mus. Skr. n.s*. 16: 89, 1934 (see Jørgensen 1934).

***Sarcocyphos aemulus* Limpr.**, *Jahresber. Schles. Ges. Vaterl. Cult*. 58 "1880": 183, 1881 (see Limpricht 1881b), "*Sarcoscyphus*". Type: AUSTRIA: Steiermark: Schladming, 1880, leg. *Breidler*; Kärnten, Maltathale, 1880, leg. *Breidler* (BP, syntypes; lectotypification needed). Syn. in Müller 1909b.

Nardia aemula (Limpr.) C.Massal. et Carestia, *Nuovo Giorn. Bot. Ital*. 14: 220, 1882 (see Massalongo & Carestia 1882).

Marsupella aemula (Limpr.) Lindb. ex Kaal., *Nyt Mag. Naturvidensk*. 33: 407, 1893 (see Kaalaas 1893).

****Marsupella aemula* Lindb.**, *Finland 1885 (290) 13 Dec*.: 2, 1885 (see Lindberg 1885), *nom. inval.* (Art. 32.1.d; no description). Cited material: s. loc. cit. *Syn. in Müller 1909b.

***Marsupella condensata* f. *pygmaea* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s*. 16: 89, 1934 (see Jørgensen 1934). Type: NORWAY: Opland: Lom, 1889, leg. *Hagen*; Troms: Nordreisa, 1893, leg. *Jørgensen* (typification needed). *Syn. nov.*

Marsupella disticha Steph. (***)

Distribution:—Eastern Asia.

***Marsupella disticha* Steph.**, *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 164 (25), 1901 (see Stephani 1901). Type: JAPAN: Honshu: Yamagata, Kattasan, leg. *Faurie* (G-15035, lectotype by Váňa et al. 2010).

Marsupella disticha var. *disticha*, *J. Hattori Bot. Lab*. 20: 42, 1958 (see Hattori 1958).

Marsupella emarginata (Ehrh.) Dumort. (***)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, North Africa, Macaronesia, West-Central Tropical Africa, East Tropical Africa, Siberia, Russian Far East, Caucasus, Western Asia, China, Eastern Asia, Indian Subcontinent, Malesia, Subarctic America, Western Canada, Eastern Canada, Northwestern USA, North-Central USA, Northeastern USA, Southwestern USA, Southeastern USA, Mexico, Central America, Western South America.

***Jungermannia emarginata* Ehrh.**, *Hannover. Mag*. 22: 141, 1784 (see Ehrhardt 1784). Type: GERMANY: Harz, leg. *Ehrhardt* (GOET, holotype).

Nardia emarginata (Ehrh.) Gray, *Nat. Arr. Brit. Pl*. 1: 694, 1821 (see Gray 1821), "*Nardius emarginatus*".

Marsupia emarginata (Ehrh.) Dumort., *Syll. Jungerm. Europ*.: 78, 1831 (see Dumortier 1831).

Marsupella emarginata (Ehrh.) Dumort., *Recueil Observ. Jungerm*.: 24, 1835 (see Dumortier 1835).

Sarcocyphos emarginatus (Ehrh.) Spruce, *Ann. Mag. Nat. Hist. Ser*. 2, 3: 501, 1849 (see Spruce 1849), "*Sarcoscyphus*".

Marsupella emarginata subsp. *emarginata* (**)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, North Africa, Macaronesia, West-Central Tropical Africa, East Tropical Africa, Siberia, Russian Far East, Caucasus, Western Asia, Indian Subcontinent, Malesia, Subarctic America, Western Canada, Eastern Canada, Northwestern USA, North-Central USA, Northeastern USA, Southwestern USA, Southeastern USA, Mexico, Central America, Western South America. Erroneously reported from Eastern Asia.

Jungermannia emarginata var. *emarginata*, *Syll. Pl. Nov.* 1: 128, 1824 (see Hornschuch 1824).

Marsupia emarginata var. *emarginata*, *Syll. Jungerm. Europ*.: 78, 1831 (see Dumortier 1831).

Sarcocyphos emarginatus var. *emarginatus*, *Hepat. Bor.-Amer. Exsicc*.: 3, 1873 (see Austin 1873), "*Sarcoscyphus*".
Marsupella emarginata var. *emarginata*, *Bull. Soc. Roy. Bot. Belgique* 13: 126, 1874 (see Dumortier 1874).
Nardia emarginata f. *emarginata*, *Brit. Hep*. 1: 14, 1874 (see Carrington 1874).
Sarcocyphos emarginatus f. *emarginatus*, *Rev. Bryol*. 2: 84, 1875 (see Lamy 1875), "*Sarcoscyphus*".
Marsupella emarginata f. *emarginata*, *Fl. Tirol* 5 "1904": 24, 1902 (see Dalla Torre & Sarnthein 1902).
Marsupella emarginata subsp. *emarginata*, *Beitr. Kryptogamenfl. Schweiz* 6(4): 136, 1924 (see Meylan 1924).
***Jungermannia macrorhiza* Dicks.**, *Pl. Crypt. Brit*. 2: 16, 1790 (see Dickson 1790). Type: UK: Scotland: "in alpibus Scoticis" (typification needed). Syn. in Hübener 1834.
****Jungermannia emarginata* var. α *fusca* Moug. et Nestl.**, *Stirp. Cryptog. Vogeso-Rhen*. 3: 243, 1812 (see Mougeot et al. 1812), *nom. inval.* (Art. 32.1.d; no description). Cited material: FRANCE/GERMANY. * *Syn. nov.*
****Jungermannia emarginata* var. β *viridis* Moug. et Nestl.**, *Stirp. Cryptog. Vogeso-Rhen*. 3: 243, 1812 (see Mougeot et al. 1812), *nom. inval.* (Art. 32.1.d; no description). Cited material: FRANCE/GERMANY. * *Syn. nov.*
***Jungermannia pulvinata* Raddi**, *Jungermanniogr. Etrusca*: 17, 1818 (see Raddi 1818). Type: ITALY: Toscana: del Dieranio (typification needed). Syn. in Hübener 1834.
Sarcocyphos pulvinatus (Raddi) Trevis., *Herb. Crypt. Trev.* 2: 28, 1853 (see Trevisan 1853), "*Sarcoscyphus*".
Sarcocyphos muelleri var. *pulvinatus* (Raddi) De Not., *Comment. Soc. Crittog. Ital*. 1: 86, 1861 (see De Notaris 1861), "*Sarcoscyphus mülleri*".
Marsupella pulvinata (Raddi) Trevis., *Rendiconti Ist. Lomb. Sci. Lett*. 7: 784, 1874 (see Trevisan 1874).
Nardia pulvinata (Raddi) Trevis., *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 401, 1877 (see Trevisan 1877).
****Jungermannia emarginata* d *minima* Schleich.**, *Cat. Pl. Helv., ed*. 4: 44, 1821 (see Schleicher 1821), *nom. inval.* (Art. 32.1.d; no description). Cited material: SWITZERLAND. * *Syn. nov.*
****Jungermannia emarginata* c *nigra* Schleich.**, *Cat. Pl. Helv., ed*. 4: 44, 1821 (see Schleicher 1821), *nom. inval.* (Art. 32.1.d; no description). Cited material: SWITZERLAND. * *Syn. nov.*
***Jungermannia emarginata* β *julacea* Nees**, *Syll. Pl. Nov.* 1: 128, 1824 (see Hornschuch 1824). Type: s.loc.cit. (typification needed). Syn. (*nov.*) in Hübener 1834.
Jungermannia emarginata var. γ *julacea* (Nees) Lindenb., *Nova Acta Acad. Caes. Leop.-Carol. German. Nat. Cur. 14, suppl*.: 75, 1829 (see Lindenberg 1829), "*I. emarginata* γ *iulacea*".
Marsupia emarginata var. γ *julacea* (Nees) Dumort., *Syll. Jungerm. Europ*.: 78, 1831 (see Dumortier 1831).
Sarcocyphos ehrhardtii γ *julaceus* (Nees) Nees, *Naturgesch. Eur. Leberm*. 1: 125, 1833 (see Nees 1833), "*Sarcoscyphus ehrharti* γ *julacea*".
**Sarcocyphos ehrhardtii* * *julaceus* (Nees) Ångstr., *Disp. Musc. Scand*.: 24, 1842 (see Ångström 1842), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus Ehrharti* * *julacea*".
Marsupella emarginata var. γ *julacea* (Nees) Dumort., *Bull. Soc. Roy. Bot. Belgique* 13: 126, 1874 (see Dumortier 1874).
****Sarcocyphos ehrhardtii* Corda**, *Naturalientausch* 12: 652, 1829 (see Corda 1829), *nom. illeg.* (Art. 52.1; the earlier *Jungermannia emarginata* Ehrh. 1784 included). Type: s. loc. cit. (typification needed). Syn. in Hübener 1834.
Sarcocyphos ehrhardtii f. *ehrhardtii*, *Naturgesch. Eur. Leberm*. 2: 417, 1836 (see Nees 1836), "*Sarcoscyphus ehrharti*".
****Jungermannia emarginata* c *nigra* Schleich. ex Lindenb.**, *Nova Acta Acad. Caes. Leop.-Carol. German. Nat. Cur. 14, suppl*.: 80, 1829 (see Lindenberg 1829), *nom. inval.* (Art. 32.1.d, 34.1.c; no description, sub *Iungermannia inflata* β *maior*). Cited material: SWITZERLAND. * *Syn. nov.*
***Sarcocyphos densifolius* Nees**, *Naturgesch. Eur. Leberm*. 1: 131, 1833 (see Nees 1833), "*Sarcoscyphus*". Type: AUSTRIA: Gösnizalpe, leg. *Funck* (typification needed). Syn. in Müller 1909b.
Marsupella densifolia (Nees) Dumort., *Recueil Observ. Jungerm*.: 24, 1835 (see Dumortier 1835).
Marsupella densifolia (Nees) Trevis., *Rendiconti Ist. Lomb. Sci. Lett*. 7: 784, 1874 (see Trevisan 1874).
Nardia densifolia (Nees) Trevis., *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 400, 1877 (see Trevisan 1877).
Sarcocyphos emarginatus var. *densifolius* (Nees) Breidl., *Mitt. Naturwiss. Vereins Steiermark* 30: 286, 1894 (see Breidler 1894).
Marsupella emarginata var. *densifolia* (Nees) Müll.Frib., *Rabenh. Krypt.-Fl., ed*. 2, 6 (8): 475, 1909 (see Müller 1909b).
Marsupella emarginata f. *densifolia* (Nees) Jørg., *Bergens Mus. Skr. n.s*. 16: 77, 1934 (see Jørgensen 1934).
Sarcocyphos muelleri var. *muelleri*, *Comment. Soc. Crittog. Ital*. 1: 86, 1861 (see De Notaris 1861), "*Sarcoscyphus mülleri*".
****Jungermannia fusca* Nees ex Huebener**, *Hepaticol. Germ*.: 121, 1834 (see Hübener 1834), *nom. illeg.* (Art. 53.1; non Lehm. 1829). Type: AUSTRIA: Salzburg: Salzburger Alpen, leg. *Funck*; POLAND/CZECH REPUBLIC: Sudeten, leg. *Nees*; GERMANY: Niedersachsen: Achtermannshöhe, leg. *Hübener*; Baden-Württemberg: Feldberg, leg. *Braun* (typification needed). Syn. in Müller 1956.
***Jungermannia ustulata* Huebener**, *Hepaticol. Germ*.: 132, 1834 (see Hübener 1834). Type: GERMANY: Rheinland-Pfalz: leg. *Hübener*; FRANCE: Alsace: Trippstadt, leg. *Lammers* (typification needed). Note: in syn of. *Marsupella sprucei* in many places due to mechanic application of name. Syn. of *Sarcoscyphus ehrharti* f. *humilis* in Nees 1836.
**Marsupella ustulata* (Huebener) Spruce ex Pearson, *Hepat. Brit. Isl*. 1: 382, 1901 (see Pearson 1901), *nom. illeg.* (Art. 53.1; non Spruce 1881).

**Marsupella ustulata* var. *ustulata*, *Rabenh. Krypt.-Fl., ed*. 2, 6 (8): 457, 1909 (see Müller 1909b), *nom. illeg.* (Art. 53.1; non Spruce 1881).

***Jungermannia emarginata* var. ε *angusta* Nees ex Huebener**, *Hepaticol. Germ*.: 124, 1834 (see Hübener 1834). Type: POLAND/CZECH REPUBLIC: Sudeten, leg. *Nees*; GERMANY, Bayern: "baierischen Alpen", leg. *Braun* (typification needed). *Syn. nov.*

***Jungermannia emarginata* var. β *grandis* Nees ex Huebener**, *Hepaticol. Germ*.: 124, 1834 (see Hübener 1834). Type: POLAND/CZECH REPUBLIC: "aus den Sudeten", leg. *Nees v. Esenbeck*; SWITZERLAND: leg. *Seringe* (typification needed). *Syn. nov.*

***Jungermannia emarginata* var. δ *turgida* Huebener**, *Hepaticol. Germ*.: 124, 1834 (see Hübener 1834). Type: GERMANY: Baden-Württemberg: Schwarzwald, leg. *Kurr* (typification needed). *Syn. nov.*

****Jungermannia varia* F.Weber et D.Mohr ex Huebener**, *Hepaticol. Germ*.: 124, 1834 (see Hübener 1834), *nom. inval.* (Art. 32.1.d, 34.1.c; no description, sub *Jungermannia emarginata*, non L. 1753). Cited material: s. loc. cit. *Syn. in Hübener 1834.

***Sarcocyphos densifolius* β *dichotomus* Nees**, *Naturgesch. Eur. Leberm*. 2: 420, 1836 (see Nees 1836), "*Sarcoscyphus*". Type: AUSTRIA: Salzburger Alpen, leg. *Funck* (typification needed). *Syn. nov.*

***Sarcocyphos densifolius* γ *fascicularis* Nees**, *Naturgesch. Eur. Leberm*. 2: 420, 1836 (see Nees 1836), "*Sarcoscyphus*". Type: AUSTRIA: Salzburg: Nassfelder Tauern, leg. *Funck* (typification needed). *Syn. nov.*

***Sarcocyphos ehrhardtii* f. *humilis* Nees**, *Naturgesch. Eur. Leberm*. 2: 417, 1836 (see Nees 1836), "*Sarcoscyphus ehrharti*". Type: s. loc. cit. (typification needed). *Syn. nov.*

***Sarcocyphos ehrhardtii* ε *ericetorum* Gottsche, Lindenb. et Nees**, *Syn. Hepat*. 1: 7, 1844 (see Gottsche et al. 1844), "*Sarcoscyphus ehrharti* ε *ericetorum*". Type: s. loc. cit. (typification needed). *Syn. nov.*

Nardia emarginata ε *ericetorum* (Gottsche, Lindenb. et Nees) C.Massal., *Annuario Reale Ist. Bot. Roma* 2 "1885": 93, 1886 (see Massalongo 1886).

Marsupella emarginata var. *ericetorum* (Gottsche, Lindenb. et Nees) Zodda, *Nuovo Giorn. Bot. Ital. n.s. (suppl*.) 41: 130, 1934 (see Zodda 1934).

***Sarcocyphos mexicanus* Lindenb. et Gottsche**, *Syn. Hepat*. 4: 618, 1846 (see Gottsche et al. 1846), "*Sarcoscyphus*". Type: MEXICO: Veracruz: Sempoaltepec, 1842 leg. *Liebmann* (C, lectotype by Váňa 2003). Syn. in Gradstein & Váňa 1987.

Nardia mexicana (Lindenb. et Gottsche) Trevis., *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 401, 1877 (see Trevisan 1877).

Marsupella mexicana (Lindenb. et Gottsche) Steph., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 164 (25), 1901 (see Stephani 1901).

***Sarcocyphos muelleri* var. β *liguricus* Gottsche**, *Hedwigia* 2: 47, 1860 (see Gottsche 1860), "*Sarcoscyphus mülleri* var. β *ligurica*". Type: ITALY: Liguria: Voltri, 1860, leg. *De Notaris & Baglietto* (typification needed). Syn. in Massalongo & Carestia 1882.

Nardia emarginata x *ligurica* (Gottsche) C.Massal. et Carestia, *Nuovo Giorn. Bot. Ital*. 14: 219, 1882 (see Massalongo & Carestia 1882).

Marsupella emarginata var. *ligurica* (Gottsche) Schiffn., *Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag* 49: 120, 1901 (see Schiffner 1901).

Marsupella emarginata f. *ligurica* (Gottsche) Jørg., *Bergens Mus. Skr. n.s*. 16: 77, 1934 (see Jørgensen 1934).

***Sarcocyphos ehrhardtii* var. *robustus* De Not.**, *Comment. Soc. Crittog. Ital*. 1: 80, 1861 (see De Notaris 1861), "*Sarcoscyphus ehrharti*". Type: ITALY: Piedmont, Varallo, 1856, leg. *De Notaris* (typification needed). Note: syn. with *Marsupella aquatica* in Bernet 1888 but type specimen annotated by R.N. Schljakov to belong to *M. emarginata* s.str. *Syn. nov.*

**Nardia robusta* (De Not.) Lindb. ex Carrington, *Brit. Hep*. 1: 14, 1874 (see Carrington 1874), *nom. inval.* (Art. 34.1.c; sub *Nardia emarginata* α *major* Carrington).

Sarcocyphos robustus (De Not.) Limpr., *Krypt.-Fl. Schlesien* "1876": 431, 1877 (see Limpricht 1877), "*Sarcoscyphus*".

Nardia robusta (De Not.) Trevis., *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 400, 1877 (see Trevisan 1877).

Marsupella emarginata var. *robusta* (De Not.) Bom. et Broth., *Herb. Mus. Fenn., ed. 2, Musci*: 1, 1894 (see Bomansson & Brotherus 1894).

Marsupella robusta (De Not.) A.Evans, *Rhodora* 10: 186, 1908 (see Evans 1908).

Marsupella robusta f. *robusta*, *Novosti Sist. Nizsh. Rast*. 8: 326, 1971 (see Schljakov 1971).

***Sarcocyphos ehrhardtii* var. *micranthus* De Not.**, *Comment. Soc. Crittog. Ital*. 1: 82, 1861 (see De Notaris 1861), "*Sarcoscyphus ehrharti*". Type: ITALY: Piemonte: Val Intrasca, leg. *De Notaris* (typification needed). *Syn. nov.*

***Sarcocyphos ehrhardtii* f. *tenuior* Rabenh.**, *Krypt.-Fl. Sachsen* 1: 343, 1863 (see Rabenhorst 1863), "*Sarcoscyphus Ehrharti*". Type: GERMANY: Mecklenburg-Vorpommern, Rostock (typification needed). *Syn. nov.*

***Jungermannia emarginata* var. b *crispata* Grognot**, *Pl. Crypt. Saône-et-Loire*: 43, 1863 (see Grognot 1863). Type: FRANCE: Saône-et-Loire: Poisot (typification needed). *Syn. nov.*

****Sarcocyphos ehrhardtii* α *minor* Gottsche et Rabenh.**, *Hepat. Eur., Leberm*. 31-33: n. 315, 1865 (see Gottsche & Rabenhorst 1865), *nom. inval*. (Art. 32.1.d; no description), "*Sarcoscyphus ehrhardti*". Cited material: GERMANY: Baden-Württemberg: Baden-Baden, leg. *Jack*. * *Syn. nov.*

****Sarcocyphos ehrhardtii* ε *montanus* J.B.Jack**, *Ber. naturf. Ges. Freiburg* 5: 8, 1870 (see Jack 1870), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus ehrharti* ε *montana*". Cited material: GERMANY: Baden-Württemberg, Seebuck; Feldsee; Bärenthal; Finsterhölzle, leg. *Jack*. * *Syn. nov.*

****Sarcocyphos piceus* Carrington**, *Brit. Hep*. 1: 14, 1874 (see Carrington 1874), *nom. inval.* (Art. 34.1.c; sub *Nardia emarginata* δ *picea*), "*Sarcoscyphus*". Cited material: s. loc. cit. *Syn. in Carrington 1874.

***Nardia emarginata* δ *picea* Carrington**, *Brit. Hep*. 1: 14, 1874 (see Carrington 1874). Type: UK: Scotland: Loch Kandon, leg. *Hunt*; Ben Macdhui, leg. *Croall*; ITALY; SWITZERLAND; GERMANY (typification needed). Syn. in Bernet 1888.

Nardia picea (Carrington) Carrington, *Brit. Hep*. 1: 17, 1874 (see Carrington 1874).

Sarcocyphos ehrhardtii var. δ *piceus* (Carrington) Gottsche et Rabenh., *Hepat. Eur., Leberm*. 62-64: n. 618, 1877 (see Gottsche & Rabenhorst 1877).

****Nardia emarginata* γ *minor* Carrington**, *Brit. Hep*. 1: 14, 1874 (see Carrington 1874), *nom. illeg.* (Art. 52.1; the earlier *Sarcocyphos ehrhardtii* γ *julacea* (Nees) Nees 1833 included). Type: s.loc.spec. (typification needed). *Syn. nov.*

**Marsupella emarginata* f. *minor* Kaal. ex Jørg., *Bergens Mus. Skr. n.s.* 16: 77, 1934 (see Jørgensen 1934), *nom. illeg.* (Art. 53.4; non Waddell 1897).

***Nardia emarginata* f. * *acutiuscula* Carrington**, *Brit. Hep*. 1: 14, 1874 (see Carrington 1874). Type: UK (typification needed). Note: originally placed under α *major*. *Syn. nov.*

***Nardia emarginata* f. ** *obtusa* Carrington**, *Brit. Hep*. 1: 14, 1874 (see Carrington 1874). Type: s.loc.spec. (typification needed). Note: originally placed under var. α *major*. *Syn. nov.*

****Sarcocyphos ehrhardtii* f. *acutus* Carrington**, *Brit. Hep*. 1: 13, 1874 (see Carrington 1874), *nom. inval.* (Art. 34.1.c; sub *Nardia emarginata*), "*Sarcoscyphus Ehrharti* f. *acuta*". Cited material: POLAND/CZECH REPUBLIC: Riesengebirge, leg. *Hilse* (location uncertain). * *Syn. nov.*

***Sarcocyphos emarginatus* f. *minor* Lamy**, *Rev. Bryol*. 2: 84, 1875 (see Lamy 1875), "*Sarcoscyphus*". Type: FRANCE (typification needed). *Syn. nov.*

***Sarcocyphos fuscus* Nees ex P.Kumm.**, *Führer Leberm*.: 25, 1875 (see Kummer 1875), "*Sarcoscyphus*". Type: CENTRAL EUROPE (typification needed). Syn. in Nees 1836.

***Nardia muelleri* var. *ligurica* C.Massal.**, *Hepat. Ital. Venet. Exsicc*.: 11, 1878 (see Massalongo 1878). Type: ITALY: leg. *De Notaris* (typification needed). *Syn. nov.*

****Nardia emarginata* f. * *minor* C.Massal. et Carestia**, *Nuovo Giorn. Bot. Ital*. 12: 311, 1880 (see Massalongo & Carestia 1880), *nom. illeg.* (Art. 53.4; non Carrington 1874). Type: ITALY: Piemonte: Alpe Nozzarella; d'Otro; Cegni; Emilio-Romagna: Buzzo; SWITZERLAND: Grimselhospitz, 1871, leg. *Jack* (typification needed). *Syn. nov.*

**Nardia emarginata* β *minor* (C.Massal. et Carestia) C.Massal., *Annuario Reale Ist. Bot. Roma* 2 "1885": 93, 1886 (see Massalongo 1886), *nom. illeg.* (Art. 53.4; non Carrington 1874).

****Nardia muelleri* var. b *ligurica-viride* Carrington**, *Cat. Brit. Moss*.: 27, 1881 (see Lees 1881), *nom. inval.* (Art. 32.1.d; no description). Cited material: UK. * *Syn. nov.*

***Nardia emarginata* xx *intermedia* C.Massal. et Carestia**, *Nuovo Giorn. Bot. Ital*. 14: 219, 1882 (see Massalongo & Carestia 1882). Type: ITALY: Emilio-Romagna: Buzzo (typification needed). *Syn. nov.*

***Marsupella emarginata* γ *gracilis* Bernet**, *Cat. Hép. Suisse*: 27, 1888 (see Bernet 1888). Type: FRANCE: Haute-Savoie: Chamonix, leg. *Payot* (typification needed). *Syn. nov.*

***Marsupella emarginata* δ *humilis* Bernet**, *Cat. Hép. Suisse*: 28, 1888 (see Bernet 1888). Type: FRANCE: Haute-Savoie: Les Voirons, leg. *Bernet* (typification needed). *Syn. nov.*

***Marsupella emarginata* α* *procera* Gottsche ex Bernet**, *Cat. Hép. Suisse*: 27, 1888 (see Bernet 1888). Type: FRANCE: Haute-Savoie: Aiguilles-Rouges, 1884, leg. *Payot & Bernet* (typification needed). *Syn. nov.*

***Nardia emarginata* f. *propagulifera* Corb.**, *Mem. Soc. Sci. Nat. Math. Cherbourg* 26: 323, 1889 (see Corbière 1889). Type: FRANCE: herb. *Corbière* (typification needed). *Syn. nov.*

***Marsupella andina* J.B.Jack et Steph.**, *Hedwigia* 31: 23, 1892 (see Jack & Stephani 1892). Type: COLOMBIA: Antioqua: Páramo de Sonsón, 1872, leg. *Wallis* (G-10879, holotype). Syn. in Gradstein & Váňa 1987.

***Nardia muelleri* var. *ligurica-viride* Carrington et Pearson ex Cooke**, *Handb. Brit. Hepat*. "1894": 222, 1893 (see Cooke 1893). Type: UK (typification needed). *Syn. nov.*

***Sarcocyphos ehrhardtii* f. *filamentosus* J.B.Jack**, *Verh. K. K. Zool.-Bot. Ges. Wien* 45: 256, 1895 (see Jack 1895), "*Sarcoscyphus ehrhardti* f. *filamentosa*". Type: AUSTRIA: Tirol: Arlberg, 1894, leg. *Arnold* (typification needed). *Syn. nov.*

Marsupella emarginata f. *filamentosa* (J.B.Jack) Dalla Torre et Sarnth., *Fl. Tirol* 5 "1904": 24, 1902 (see Dalla Torre & Sarnthein 1902).

****Marsupella emarginata* var. c *minor* Carrington ex Waddell**, *Moss Exch. Club Cat. Brit. Hepat*.: 6, 1897 (see Waddell 1897), *nom. illeg.* (Art. 52.1; the earlier *Sarcoscyphos erhartii* var. γ *julacea* (Nees) Gottsche, Lindenberg et

Nees 1844 included). Type: s. loc. cit. (typification needed). *Syn. nov.*

***Marsupella sumatrana* Schiffn.**, *Akad. Wiss. Wien, Math.-Naturwiss. Kl., Denkschr.* 67: 186, 1898 (see Schiffner 1898b). Type: INDONESIA: Sumatra: Mt. Merapi, leg. *Schiffner* (FH, holotype). Syn. (*nov.*) in Kitagawa 1981.

Marsupella sumatrana var. *sumatrana*, *Akad. Wiss. Wien, Math.-Naturwiss. Kl., Denkschr.* 67: 187, 1898 (see Schiffner 1898b).

***Marsupella sumatrana* var. *lurida* Schiffn.**, *Akad. Wiss. Wien, Math.-Naturwiss. Kl., Denkschr.* 67: 187, 1898 (see Schiffner 1898b). Type: INDONESIA: Sumatra: Mt. Merapi, 1894, leg. *Schiffner* (typification needed). Syn. in Váňa 1999.

****Marsupella emarginata* var. *minor* C.Massal. ex Schiffn.**, *Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag n.s.* 48: 322, 1900 (see Schiffner 1900), *nom. inval.* (Art. 32.1.d; no description). Cited material: CZECH REPUBLIC: Isergebirge, 1898, leg. *Schiffner*. * *Syn. nov.*

***Marsupella pearsonii* Macvicar**, *J. Bot.* 43: 117, 1905 (see Macvicar 1905). Type: UK: England: Cumberland, 1893, leg. *Pearson*; Westmoreland, 1904, leg. *Pearson*; Wales: Snowdon, l904, leg. *Pearson*; Scotland, Argyllshire, 1904, leg. *Scott* (typification needed). Note: intermediate form between *M. emarginata* and *M. aquatica*, some syntypes more close to the latter. Syn. in Müller 1956.

Marsupella pearsonii var. *pearsonii*, *Lotos* 58: 253, 1910 (see Schiffner 1910d).

Marsupella emarginata var. *pearsonii* (Macvicar) Jørg., *Bergens Mus. Skr. n.s.* 16: 78, 1934 (see Jørgensen 1934).

Marsupella emarginata f. *pearsonii* (Macvicar) S.W.Arnell, *Bot. Not*. 103: 21, 1950 (see Arnell 1950).

**Marsupella aquatica* var. *pearsonii* (Macvicar) E.W.Jones, *Trans. Brit. Bryol. Soc.* 3: 362, 1958 (see Jones 1958), *nom. inval.* (Art. 33.4; basionym not cited).

Marsupella robusta f. *pearsonii* (Macvicar) Schljakov, *Novosti Sist. Nizsh. Rast*. 8: 326, 1971 (see Schljakov 1971).

Marsupella aquatica f. *pearsonii* (Macvicar) Schljakov, *Petjen. Mchi Sev. SSSR* 4: 85, 1981 (see Schljakov 1981).

***Lophozia canariensis* Bryhn**, *Kongel. Norske Vidensk. Selsk. Forh*. 8: 8, 1908 (see Bryhn 1908). Type: CANARY ISLANDS: Tenerife, Las Mercedes, 1908, leg. *Bryhn* (typification needed). Syn. in Müller 1956.

****Nardia pectinata* Carrington ex Müll.Frib.**, *Rabenh. Krypt.-Fl., ed*. 2, 6 (8): 474, 1909 (see Müller 1909b), *nom. inval.* (Art. 32.1.d, 34.1.c; no description, sub *Marsupella emarginata*). Cited material: UK: Wales: Barmouth, Tyn-y-Gros. *Syn. in Müller 1909a.

****Marsupella cambrica* Pearson ex Schiffn.**, *Lotos* 58: 251, 1910 (see Schiffner 1910d), *nom. inval.* (Art. 34.1.c; sub *Marsupella emarginata*). Cited material: UK: Wales: Llanberis, 1904, leg. *Pearson*. *Syn. (*nov.*) in Schiffner 1910d.

***Marsupella emarginata* f. *nigra* C.E.O.Jensen**, *Danmarks Mosser*: 78, 1915 (see Jensen 1915). Type: DENMARK: s.loc.cit. (typification needed). *Syn. nov.*

***Marsupella emarginata* f. *gracilescens* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s.* 16: 77, 1934 (see Jørgensen 1934). Type: NORWAY: Hordaland: Hop; Møre og Romsdal: Ørsta (typification needed). *Syn. nov.*

***Marsupella emarginata* f. *umbraticola* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s.* 16: 77, 1934 (see Jørgensen 1934). Type: NORWAY: Troms: Lyngen (typification needed). *Syn. nov.*

***Marsupella emarginata* var. *attenuata* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s.* 16: 78, 1934 (see Jørgensen 1934). Type: NORWAY: Opland: Filefjell, leg. *Kaalaas* (typification needed). *Syn. nov.*

****Marsupella emarginata* var. *obtusiloba* Schiffn.**, *Krit. Bemerk. Eur. Lebermoose* 27: 8, 1941 (see Schiffner 1941), *nom. inval.* (Art. 36.1; no Latin description). Cited material: AUSTRIA: Tirol: Hall, 1913, leg. *Schiffner*. * *Syn. nov.*

****Marsupella emarginata* f. *umbrosa* Schiffn.**, *Krit. Bemerk. Eur. Lebermoose* 27: 8, 1941 (see Schiffner 1941), *nom. inval.* (Art. 36.1; no Latin description). Cited material: AUSTRIA: Steiermark: Deutsch-Landsberg, 1932, leg. *Schiffner*. * *Syn. nov.*

***Marsupella fosteri* Steph. ex Bonner**, *Candollea* 14: 254, 1953 (see Bonner 1953b). Type: USA: Washington: Hamilton, 1904, leg. *Foster* (G-14847, holotype). *Syn. nov.*

****Marsupella emarginata* var. *latiloba* R.M.Schust.**, *Hepat. Anthocerotae N. Amer.* 3: 77, 1974 (see Schuster 1974), *nom. inval.* (Art. 37.3; based on more than one gathering). Cited material: USA: North Carolina: Linville Gorge, leg. *Schuster* (no herbarium specified). * *Syn. nov.*

Marsupella emarginata subsp. *tubulosa* (Steph.) N.Kitag. (**)

Distribution:—Siberia, Russian Far East, China, Eastern Asia.

***Marsupella tubulosa* Steph.**, *Bull. Herb. Boiss*. 5: 99, 1897 (see Stephani 1897). Type: JAPAN: Honshu: Nagasaki, leg. *Faurie* (G-15042, lectotype by Kitagawa 1960 as “isotype”, 1963b as “type").

Marsupella tubulosa var. *tubulosa*, *Bull. Tokyo Sci. Mus*. 11: 78, 1944 (see Hattori 1944a).

Marsupella tubulosa f. *tubulosa*, *Bull. Tokyo Sci. Mus*. 11: 78, 1944 (see Hattori 1944a).

Marsupella emarginata subsp. *tubulosa* (Steph.) N.Kitag., *Mem. Coll. Sci. Kyoto Imp. Univ., Ser. B, Biol*. 27: 76, 1960 (see Kitagawa 1960).

***Marsupella tubulosa* f. *intermedia* S.Hatt.**, *Bull. Tokyo Sci. Mus*. 11: 78, 1944 (see Hattori 1944a). Type: JAPAN: Honshu: Osumi, 1941, leg. *Hattori* (TNS, lectotype by Kitagawa 1963). Syn. in Kitagawa 1963.

***Marsupella tubulosa* f. *rubidula* S.Hatt.**, *Bull. Tokyo Sci. Mus*. 11: 78, 1944 (see Hattori 1944a). Type: JAPAN: Honshu: Osumi, 1941, leg. *Hattori* (TNS, holotype). Syn. in Kitagawa 1963.

***Marsupella japonica* Steph. ex Bonner**, *Candollea* 14: 255, 1953 (see Bonner 1953b). Type: JAPAN: Honshu: Daisen, 1899, leg. *Faurie* (G-15038, holotype). Syn. in Kitagawa 1963.

***Marsupella mikawana* Steph. ex Bonner**, *Candollea* 14: 255, 1953 (see Bonner 1953b). Type: JAPAN: Honshu: Okazaki, 1913, leg. *Okamura* (G-15039, holotype). Syn. in Kitagawa 1963.

Marsupella emarginata subsp. *tubulosa var. apertifolia* (Steph.) N.Kitag. (**)

Distribution:—Eastern Asia.

***Marsupella apertifolia* Steph.**, *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 162 (23), 1901 (see Stephani 1901). Type: JAPAN: Honshu: Mt.Myoko-san, leg. *Faurie* (G, lectotype by Kitagawa 1963).

Marsupella tubulosa var. *apertifolia* (Steph.) S.Hatt., *Bull. Tokyo Sci. Mus*. 11: 78, 1944 (see Hattori 1944a).

Marsupella emarginata subsp. *tubulosa var. apertifolia* (Steph.) N.Kitag., *J. Hattori Bot. Lab*. 26: 89, 1963 (see Kitagawa 1963).

***Marsupella sphacelata* var. *pachyderma* S.Hatt.**, *J. Jap. Bot*. 20: 266, 1944 (see Hattori 1944b). Type: JAPAN: Kyushu: Unzen, 1940, leg. *Asano* (TNS, holotype). Syn. in Kitagawa 1963.

Marsupella emarginata subsp. *tubulosa var. patens* N.Kitag. (**)

Distribution:—China, Eastern Asia.

***Marsupella emarginata* subsp. *tubulosa var. patens* N.Kitag.**, *Mem. Coll. Sci. Kyoto Imp. Univ., Ser. B, Biol*. 27: 77, 1960 (see Kitagawa 1960). Type: JAPAN: Honshu: Mie, leg. *Iwatsuki & Kitagawa* (KYO, holotype).

Marsupella emarginata subsp. *tubulosa var. tubulosa* (Steph.) N.Kitag. (**)

Distribution:—China, Eastern Asia.

Marsupella emarginata var. tubulosa (Steph.) N.Kitag., *Mem. Coll. Sci. Kyoto Imp. Univ., Ser. B, Biol*. 27: 77, 1960 (see Kitagawa 1960).

Marsupella funckii (F.Weber et D.Mohr) Dumort. (***)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, Macaronesia, Siberia, Russian Far East, Caucasus, Western Asia, Southeastern USA. Erroneously reported from Eastern Asia.

***Jungermannia funckii* F.Weber et D.Mohr**, *Bot. Taschenb. (Weber*): 422, 1807 (see Weber & Mohr 1807). Type: GERMANY: Thüringen: Frankenwald (W, holotype).

Marsupia funckii (F.Weber et D.Mohr) Dumort., *Syll. Jungerm. Europ*.: 79, 1831 (see Dumortier 1831).

Sarcocyphos funckii (F.Weber et D.Mohr) Nees, *Naturgesch. Eur. Leberm*. 1: 135, 1833 (see Nees 1833), "*Sarcoscyphus*".

Jungermannia funckii var. *funckii*, *Hepaticol. Germ*.: 134, 1834 (see Hübener 1834).

Marsupella funckii (F.Weber et D.Mohr) Dumort., *Recueil Observ. Jungerm*.: 24, 1835 (see Dumortier 1835).

Sarcocyphos funckii f. *funckii*, *Hepat. Eur., Leberm*. 45-47: n. 459, 1869 (see Gottsche & Rabenhorst 1869).

Marsupella funckii var. *funckii*, *Bull. Soc. Roy. Bot. Belgique* 13: 128, 1874 (see Dumortier 1874).

Nardia funckii (F.Weber et D.Mohr) Carrington ex Lindb., *Acta Soc. Sci. Fenn*. 10: 103, 1875 (see Lindberg 1871).

Sarcocyphos funckii var. *funckii*, *Führer Leberm*.: 26, 1875 (see Kummer 1875), "*Sarcoscyphus*".

Nardia funckii var. *funckii*, *Annuario Reale Ist. Bot. Roma* 2 "1885": 94, 1886 (see Massalongo 1886).

Marsupella funckii f. *funckii*, *Bergens Mus. Skr. n.s*. 16: 82, 1934 (see Jørgensen 1934).

****Jungermannia byssacea* Moug. et Nestl.**, *Stirp. Cryptog. Vogeso-Rhen.* 3: 531, 1812 (see Mougeot et al. 1812), *nom. illeg.* (Art. 53.1; non Roth 1800). Type: AUSTRIA: Steiermark: Schlossberg, leg. *Sauter* (typification needed). *Syn. nov.*

Marsupella funckii var. *byssacea* (Moug. et Nestl.) Dalla Torre et Sarnth., *Fl. Tirol* 5 "1904": 25, 1902 (see Dalla Torre & Sarnthein 1902).

****Jungermannia glacialis* Schleich.**, *Cat. Pl. Helv., ed*. 4: 44, 1821 (see Schleicher 1821), *nom. inval.* (Art. 32.1.d, no description). Cited material: SWITZERLAND: "Helvetia" (LAU). *Syn. in Hübener 1834.

***Sarcocyphos muelleri* Nees**, *Naturgesch. Eur. Leberm*. 1: 132, 1833 (see Nees 1833), "*Sarcoscyphus mülleri*". Type: GERMANY: Rheinland-Pfalz: Kaiserlautern, leg. *Müller* (typification needed). Syn. in Müller 1909b.

Marsupella muelleri (Nees) Dumort., *Recueil Observ. Jungerm*.: 24, 1835 (see Dumortier 1835), "*mulleri*".

Nardia muelleri var. *muelleri*, *Hepat. Ital. Venet. Exsicc*.: 11, 1878 (see Massalongo 1878).

Nardia muelleri (Nees) C.Massal., *Hepat. Ital. Venet. Exsicc*.: 11, 1878 (see Massalongo 1878).

***Sarcocyphos funckii* α *major* Nees**, *Naturgesch. Eur. Leberm*. 1: 135, 1833 (see Nees 1833), "*Sarcoscyphus*". Type: GERMANY: Bayern: Erlangen, leg. *Nees*; Baden-Württemberg: Schwarzwald, leg. *Braun* (typification needed). *Syn. nov.*

Marsupella funckii var. α *major* (Nees) Boulay, *Musc. France* 2: 148, 1904 (see Boulay 1904).

Marsupella funckii f. *major* (Nees) Jørg., *Bergens Mus. Skr. n.s*. 16: 82, 1934 (see Jørgensen 1934).

***Sarcocyphos funckii* β *minor* Nees**, *Naturgesch. Eur. Leberm*. 1: 135, 1833 (see Nees 1833), "*Sarcoscyphus*". Type: many syntypes (typification needed). *Syn. nov.*

Marsupella funckii var. β *minor* (Nees) Dumort., *Bull. Soc. Roy. Bot. Belgique* 13: 128, 1874 (see Dumortier 1874).

Nardia funckii β *minor* (Nees) C.Massal., *Annuario Reale Ist. Bot. Roma* 2 "1885": 94, 1886 (see Massalongo 1886).

***Jungermannia funckii* var. γ *gracilescens* Huebener**, *Hepaticol. Germ*.: 134, 1834 (see Hübener 1834). Type: "vorzüglich in Gebirgsgegenden" - location missing (typification needed). *Syn. nov.*

Sarcocyphos funckii var. *gracilescens* (Huebener) P.Kumm., *Führer Leberm*.: 26, 1875 (see Kummer 1875), "*Sarcoscyphus*".

***Jungermannia funckii* var. β *rupestris* Huebener**, *Hepaticol. Germ*.: 134, 1834 (see Hübener 1834). Type: GERMANY: Reinland-Pfalz, Trier, leg. *Huebener* (typification needed). *Syn. nov.*

***Sarcocyphos funckii* γ *diffusus* Nees**, *Naturgesch. Eur. Leberm*. 2: 422, 1836 (see Nees 1836), "*Sarcoscyphus*". Type: CZECH REPUBLIC: Haindorf, leg. *Nees* (typification needed). *Syn. nov.*

***Sarcocyphos funckii* β* *exiguus* Gottsche, Lindenb. et Nees**, *Syn. Hepat*. 1: 9, 1844 (see Gottsche et al. 1844). Type: GERMANY: Harz, leg. *Hampe* (typification needed). Note: originally placed under var. β *minor*. *Syn. nov.*

****Sarcocyphos ehrhardtii* f. *lobis* Gottsche et Rabenh.**, *Hepat. Eur., Leberm*. 38-39: n. 374, 1867 (see Gottsche & Rabenhorst 1867), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus ehrhardti*". Cited material: AUSTRIA: Ober-Österreich: Alpe Warscheneck, leg. *Juratzka*. * *Syn. nov.*

***Sarcocyphos funckii* f. *robustior* Gottsche et Rabenh.**, *Hepat. Eur., Leberm*. 45-47: n. 459, 1869 (see Gottsche & Rabenhorst 1869). Type: SWITZERLAND: Graubünden, Silvrettagebirge, 1868 leg. *Jack* (typification needed). *Syn. nov.*

****Sarcocyphos funckii* f. γ *alpestris* Saut.**, *Mitt. Ges. Salzburger Landesk*. 11: 10, 1871 (see Sauter 1871), *nom. inval.* (Art. 32.1.d; no description). Cited material: AUSTRIA: Salzburg: Untersberg. * *Syn. nov.*

***Nardia funckii* β* *diffusa* Carrington**, *Brit. Hep*. 1: 17, 1874 (see Carrington 1874). Type: s. loc. cit. (typification needed). *Syn. nov.*

Marsupella funckii var. c *diffusa* (Carrington) Waddell, *Moss Exch. Club Cat. Brit. Hepat*.: 6, 1897 (see Waddell 1897).

***Nardia funckii* β *robustior* Carrington**, *Brit. Hep*. 1: 17, 1874 (see Carrington 1874). Type: s. loc. cit. (typification needed). *Syn. nov.*

Marsupella funckii var. b *robustior* (Carrington) Waddell, *Moss Exch. Club Cat. Brit. Hepat*.: 6, 1897 (see Waddell 1897).

***Nardia funckii* β *decipiens* C.Massal. et Carestia**, *Nuovo Giorn. Bot. Ital*. 12: 313, 1880 (see Massalongo & Carestia 1880). Type: ITALY: Aosta: Plaida, 1877, leg. *Carestia* (VER, holotype). *Syn. nov.*

Marsupella decipiens (C.Massal. et Carestia) Spruce, *Rev. Bryol*. 8: 95, 1881 (see Spruce 1881b).

**Sarcocyphos funckii* var. *decipiens* (C.Massal. et Carestia) Spruce, *Rev. Bryol*. 8: 95, 1881 (see Spruce 1881b), *nom. inval.* (Art. 34.1.c; sub *Marsupella decipiens*), "*Sarcoscyphus*".

***Sarcocyphos pygmaeus* Limpr.**, *Jahresber. Schles. Ges. Vaterl. Cult*. 58 "1880": 181, 1881 (see Limpricht 1881b), "*Sarcoscyphus*". Type: AUSTRIA: Kärnten, "Kärnther Alpen", leg. *Funck* (BP, holotype). Syn. in Grolle 1976b.

Marsupella pygmaea (Limpr.) Steph., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 165 (26), 1901 (see Stephani 1901).

***Marsupella funckii* var. *gracilis* Bernet**, *Cat. Hép. Suisse*: 31, 1888 (see Bernet 1888). Type: FRANCE: Haute-Savoie: Voirons, leg. *Bernet* (typification needed). *Syn. nov.*

****Sarcocyphos funckii* var. *obtusifolius* Payot**, *Rev. Bryol*. 15: 19, 1888 (see Payot 1888), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus*". Cited material: SWITZERLAND/ITALY: Grand-St-Bernard; FRANCE: Haute-Savoie: Aiguilles Rouges. * *Syn. nov.*

***Marsupella badensis* Schiffn.**, *Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag* 49: 118, 1901 (see Schiffner 1901). Type: GERMANY: Baden-Württemberg: Feldberg, 1899, leg. *Müller* (FH, lectotype by Váňa 1999). Syn. in Duda & Váňa 1983.

Marsupella funckii var. *badensis* (Schiffn.) Fam., *Denkschr. Bayer. Bot. Ges. Regensburg* 14: 51, 1920 (see Familler 1920).

***Sarcocyphos badensis* Schiffn. ex Müll.Frib.**, *Beih. Bot. Centralbl*. 10: 214, 1901 (see Müller 1901), "*Sarcoscyphus*". Type: GERMANY: Baden-Württemberg: Feldberg, 1899, leg. *Müller* (FH, lectotype by Váňa et al. 2010). Syn. in Duda & Váňa 1983.

***Marsupella ramosa* Müll.Frib.**, *Rabenh. Krypt.-Fl., ed.* 2, 6 (8): 471, 1909 (see Müller 1909b). Type: GERMANY: Bayern: Allgäu, 1895, leg. *Holler* (S, holotype). Syn. (*nov.*) in Váňa 1999.

Marsupella funckii var. *ramosa* (Müll.Frib.) Husn., *Hepaticol. Gall., ed*.2: 120, 1922 (see Husnot 1922).

****Marsupella hungarica* Boros et Vajda**, *Rev. Bryol. Lichénol*. 29: 97, 1960 (see Boros & Vajda 1960), *nom. inval.* (Art. 37.1; no type indicated). Cited material: HUNGARY: Hont: Kemence, 1958, leg. *Vajda* (BP). *Syn. in Grolle 1976b.

***Marsupella hungarica* Boros et Vajda ex Vajda**, *Stud. Bot. Hung*. 15: 91, 1981 (see Vajda 1981). Type: HUNGARY: Hont: Kemence, 1958, leg. *Vajda* (BP-45202, holotype). Syn. in Grolle 1976b.

Marsupella microphylla R.M.Schust. (***)

Distribution:—Northern South America, ?Brazil (reports from SE Brazil questioned).

***Marsupella microphylla* R.M.Schust.**, *Phytologia* 39: 249, 1978 (see Schuster 1978). Type: VENEZUELA: Mérida: Sierra de Nevada de Mérida: leg. *Schuster & Ruiz-Teran* (F, holotype).

Marsupella miniata (Lindenb. et Gottsche) Grolle (***)

Distribution:—Mexico, Central America, Northern South America, Western South America, Southern South America. Erroneously reported from Malesia.

***Gymnomitrion miniatum* Lindenb. et Gottsche**, *Syn. Hepat*. 4: 617, 1846 (see Gottsche et al. 1846). Type: MEXICO: Veracruz: Mt. Oriza, 1841, leg. *Liebmann* (C, lectotype fide Váňa 2003).

Acolea miniata (Lindenb. et Gottsche) Trevis., *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 395, 1877 (see Trevisan 1877).

Cesius miniatus (Lindenb. et Gottsche) Kuntze, *Revis. Gen. Pl*. 2: 834, 1891 (see Kuntze 1891), "*Cesiusa miniata*".

Marsupella miniata (Lindenb. et Gottsche) Grolle, *J. Jap. Bot*. 41: 144, 1966 (see Grolle 1966a).

***Marsupella lorentziana* Steph.**, *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 158 (19), 1901 (see Stephani 1901). Type: ARGENTINA: s. loc., leg. *Lorenz* (G-10884, holotype). Syn. in Váňa 2003.

****Marsupella austro-americana* Váňa ex Gradst. et Hekking**, *J. Hattori Bot. Lab*. 45: 121, 1979 (see Gradstein & Hekking 1979), *nom. inval*. (Art. 32.1.d, 36.1; no description). Cited material: COLOMBIA: Boyaca: Sierra Nevada de Cocoy, leg. *Cleef*. * *Syn. nov.*

****Marsupella andicola* R.M.Schust.**, *Nova Hedwigia Beih.* 119: 555, 2002 (see Schuster 2002), *nom. inval.* (Art. 36.1; no Latin description). Cited material: VENEZUELA: Mérida: Páramo de Mucabaji. *Syn. in with doubt Váňa 2003.

Marsupella minutissima N.Kitag. (**)

Distribution:—China, Eastern Asia.

***Marsupella minutissima* N.Kitag.**, *Mem. Coll. Sci. Kyoto Imp. Univ., Ser. B, Biol*. 27: 81, 1960 (see Kitagawa 1960). Type: JAPAN: Shikoku: Ehime, 1927, leg. *Ochi* (NICH-71536, holotype).

Marsupella neesii Sande Lac. ex Schiffn. (***)

Distribution:—Malesia.

****Sarcocyphos neesii* Nees ex Sande Lac.**, *Ann. Mus. Bot. Lugduno-Batavi* 1: 288, 1864 (see Sande Lacoste 1864), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus*". Cited material: INDONESIA: Java: Salak, leg. *Kurz*.

Marsupella neesii Sande Lac. ex Schiffn., *Consp. Hepat. Arch. Ind*.: 70, 1898 (see Schiffner 1898a).

***Marsupella vulcanica* Schiffn.**, *Akad. Wiss. Wien, Math.-Naturwiss. Kl., Denkschr*. 67: 186, 1898 (see Schiffner 1898b). Type: INDONESIA: Java: Papandayan, 1894, leg. *Schiffner*; Kawah Manuk, 1894, leg. *Schiffner*; INDONESIA: Sumatra: Merapi 1894, leg. *Schiffner* (typification needed). *Syn. nov.*

Marsupella paroica R.M.Schust. (***)

Distribution:—Eastern Canada, North-Central USA, Southeastern USA, Mexico.

***Marsupella paroica* R.M.Schust.**, *Bryologist* 60: 145, 1957 (see Schuster 1957). Type: USA: North Carolina: Soco Falls, 1952, leg. *Schuster* (F-1054511, holotype).

Marsupella profunda Lindb. (***)

Distribution:—Northern Europe, Southwestern Europe, Macaronesia (Fig. 5).

***Marsupella profunda* Lindb.**, *Rev. Bryol*. 14: 19, 1887 (see Lindberg 1887b). Type: PORTUGAL: Minho: Povoa do Lanhoso, 1882, leg. *Couceiro* (H-SOL, holotype).

Marsupella pseudofunckii S.Hatt. (***)

Distribution:—Russian Far East, China, Eastern Asia.

****Marsupella pseudofunckii* S.Hatt.**, *Bull. Yamagata Agric. College* 1: 43, 1949 (see Hattori 1949), *nom. inval.* (Art. 32.1.d; no description). Cited material: JAPAN: Honshu: Mt. Asahi.

***Marsupella pseudofunckii* S.Hatt.**, *J. Hattori Bot. Lab*. 4: 63, 1950 (see Hattori 1950). Type: JAPAN: Shikoku: Omogo valley, 1940, leg. *Hattori* 5540 (Kitagawa 1963b erronously give the type of Japan, Prov. Kagoshima, Isl. Yakushima, leg. S. Hattori 7701).

Marsupella disticha var. *pseudofunckii* (S.Hatt.) S.Hatt., *J. Hattori Bot. Lab*. 20: 42, 1958 (see Hattori 1958).

Marsupella shimizuana S.Hatt. (?)

Distribution:—Eastern Asia.

****Marsupella shimizuana* S.Hatt.**, *J. Hattori Bot. Lab*. 10: 70, 1953 (see Hattori 1953), *nom. inval.* (Art. 36.1; no Latin description). Cited material: JAPAN: Honshu: Chichibu, 1952, leg. *Shimizu*. Note: not mentioned later and we do not know what it is.

Marsupella sparsifolia (Lindb.) Dumort. (***)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, Macaronesia, Southern Africa, Caucasus, Australia, New Zealand, Subarctic America, Western Canada, Eastern Canada, Northwestern USA, Northeastern USA, Southwestern USA, Subantarctic Islands. Erroneously reported from East Tropical Africa, North-Central USA.

***Sarcocyphos sparsifolius* Lindb.**, *Not. Sällsk. F. Fl. Fenn. Förhandl*. 9: 280, 1868 (see Lindberg 1868), "*Sarcoscyphus*". Type: NORWAY: Buskerud: Kongsberg, 1865, leg. *Cleve* (H-SOL, holotype).

Nardia sparsifolia (Lindb.) Lindb., *Not. Sällsk. Fauna Fl. Fenn. Förh.* 13: 370, 1874 (see Lindberg 1874).

Marsupella sparsifolia (Lindb.) Dumort., *Bull. Soc. Roy. Bot. Belgique* 13: 128, 1874 (see Dumortier 1874).

****Marsupella sparsifolia* var. *africana* S.W.Arnell**, *Rev. Bryol. Lichénol*. 22: 3, 1953 (see Arnell 1953b), *nom. inval.* (Art. 36.1; no Latin description). Cited material: SOUTH AFRICA: Western Cape: Du Toit Pass, leg. *Esterhuysen* (BOL). *Syn. (*nov.*) in Váňa 1985.

Marsupella sparsifolia subsp. *childii* R.M.Schust. (?) Fig. 6.

Distribution:—Australia, New Zealand.

Note:—The taxon is recognized by Engel & Glenny (2008) although the name is not validated there. We are not validating it until we have localized a possible type specimen.

****Marsupella sparsifolia* subsp. *childii* R.M.Schust.**, *J. Hattori Bot. Lab*. 80: 61, 1996 (see Schuster 1996a), *nom. inval.* (Art. 37.7; no herbarium indicated). Cited material: NEW ZEALAND: South I: Fiordland, leg. *Schuster.*

Marsupella sparsifolia subsp. *sparsifolia* (?)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, Macaronesia, Southern Africa, Caucasus, Subarctic America, Western Canada, Eastern Canada, Northwestern USA, Northeastern USA, Southwestern USA, Subantarctic Islands. Erroneously reported from East Tropical Africa, North-Central USA.

Nardia sparsifolia var. *sparsifolia*, *Not. Sällsk. Fauna Fl. Fenn. Förh*. 13: 371, 1874 (see Lindberg 1874).

Sarcocyphos sparsifolius var. *sparsifolius*, *Jahresber. Schles. Ges. Vaterl. Cult*. 58 "1880": 184, 1881 (see Limpricht 1881b), "*Sarcoscyphus*".

Marsupella sparsifolia var. *sparsifolia*, *Rabenh. Krypt.-Fl., ed.* 2, 6 (8): 453, 1909 (see Müller 1909b).

Marsupella sparsifolia subsp. *sparsifolia*, *J. Hattori Bot. Lab*. 80: 61, 1996 (see Schuster 1996a), no validly publishes subspecies exist. Note: the autonym is technically not existing as subsp. *childii* is not valid.

***Sarcocyphos styriacus* Limpr.**, *Jahresber. Schles. Ges. Vaterl. Cult*. 58 "1880": 180, 1881 (see Limpricht 1881b), "*Sarcoscyphus*". Type: AUSTRIA: Steiermark: Schladming, 1880, leg. *Breidler* (BP, holotype). Syn. in Müller 1909b.

Marsupella styriaca (Limpr.) Kaal., *Nyt Mag. Naturvidensk*. 33: 416, 1893 (see Kaalaas 1893).

***Sarcocyphos sparsifolius* var. *noricus* Limpr.**, *Jahresber. Schles. Ges. Vaterl. Cult*. 58 "1880": 184, 1881 (see Limpricht 1881b), "*Sarcoscyphus*". Type: AUSTRIA: Steiermark: Stadl, 1878, leg. *Breidler*; Pinzgau, 1879, leg. *Breidler* (BP, syntypes; lectotypification needed). *Syn. nov.*

Marsupella sparsifolia var. *norica* (Limpr.) Müll.Frib., *Rabenh. Krypt.-Fl., ed.* 2, 6 (8): 453, 1909 (see Müller 1909b).

Marsupella sphacelata (Giesecke ex Lindenb.) Dumort. (***)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, Macaronesia, Siberia, Russian Far East, Caucasus, China, Eastern Asia, Subarctic America, Western Canada, Eastern Canada, Northwestern USA, North-Central USA, Northeastern USA, Southwestern USA, Southeastern USA.

***Jungermannia sphacelata* Giesecke ex Lindenb.**, *Nova Acta Acad. Caes. Leop.-Carol. German. Nat. Cur. 14, suppl*.: 76, 1829 (see Lindenberg 1829). Type: GREENLAND: leg. *Gieseke* (W, lectotype by Váňa et al. 2010).

Marsupia sphacelata (Giesecke ex Lindenb.) Dumort., *Syll. Jungerm. Europ*.: 78, 1831 (see Dumortier 1831).

Sarcocyphos sphacelatus (Giesecke ex Lindenb.) Nees, *Naturgesch. Eur. Leberm*. 1: 129, 1833 (see Nees 1833), "*Sarcoscyphus*".

Marsupella sphacelata (Giesecke ex Lindenb.) Dumort., *Recueil Observ. Jungerm*.: 24, 1835 (see Dumortier 1835).

Nardia sphacelata (Giesecke ex Lindenb.) Carrington, *Trans. & Proc. Bot. Soc. Edinburgh* 10: 378, 1870 (see Carrington 1870).

Marsupella sphacelata var. *sphacelata*, *Rendiconti Ist. Lomb. Sci. Lett.* 7: 783, 1874 (see Trevisan 1874).

Marsupella sphacelata f. *sphacelata*, *Hepat. Anthocerotae N. Amer.* 3: 59, 1974 (see Schuster 1974).

***Sarcocyphos ehrhardtii* δ *saccatus* Nees**, *Naturgesch. Eur. Leberm*. 1: 125, 1833 (see Nees 1833), "*Sarcoscyphus ehrharti* δ *saccata*". Type: GERMANY (typification needed). *Syn. nov.*

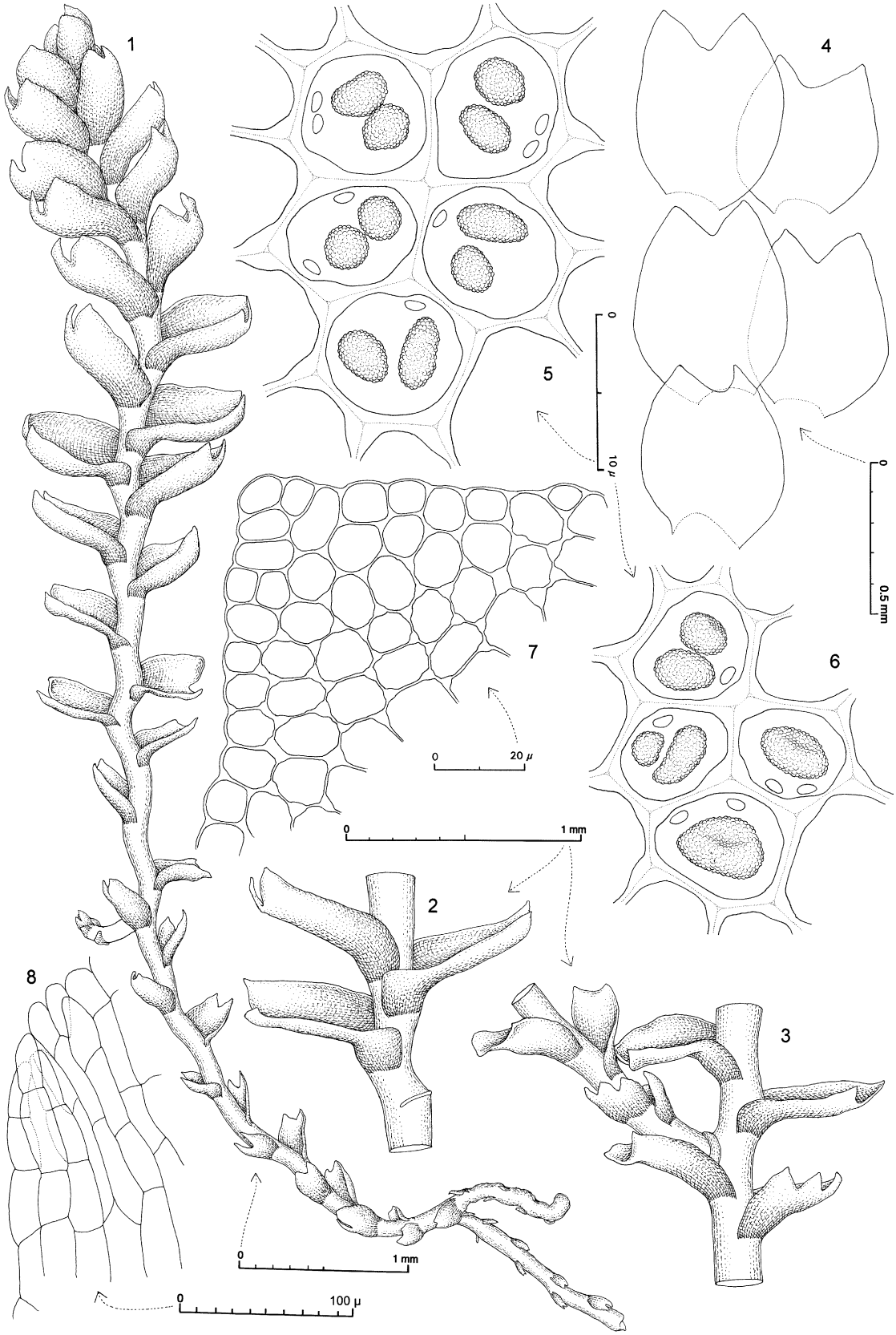

FIGURE 6. *Marsupella sparsifolia* subsp *childii* R.M.Schust. 1. Leading shoot with 2 stoloniform, lateral-intercalary branches (dorsal view); note also the stoloniform basal sector of the shoot and the dorsally interlocking merophytes. 2. Sector of leading shoot showing leaf insertions crossing stem midline dorsally. 3. Sector of main shoot with a lateral-intercalary branch, dorsal view; note 3-lobed leaf. 4. Five leaves. 5, 6. Median leaf cells with oil-bodies. 7. Portion of leaf lobe. 8. Portion of perianth mouth. From Engel & Glenny (2008) with permission.

Jungermannia emarginata var. *saccata* (Nees) Moug., Nestl. et Schimp., *Stirp. Cryptog. Vogeso-Rhen*. 12: n. 1136, 1843 (see Mougeot et al. 1843).

Marsupella emarginata var. *saccata* (Nees) Pearson, *Hepat. Brit. Isl*. 1: 376, 1901 (see Pearson 1901).

Marsupella sphacelata var. *saccata* (Nees) Jørg., *Bergens Mus. Skr. n.s*. 16: 79, 1934 (see Jørgensen 1934).

***Sarcocyphos sphacelatus* var. *medius* Gottsche**, *Hepat. Eur., Leberm*. 13-14 "1861": no. 137, 1860 (see Rabenhorst 1860), "*Sarcoscyphus sphacelatus* var. *media*". Type: SWITZERLAND: Uri, Maderaner-Thale, 1859, leg. *Hepp* (typification needed). Syn. in Müller 1909b.

Marsupella sphacelata var. *media* (Gottsche) Trevis., *Rendiconti Ist. Lomb. Sci. Lett*. 7: 783, 1874 (see Trevisan 1874).

Nardia sphacelata β *media* (Gottsche) C.Massal., *Annuario Reale Ist. Bot. Roma* 2 "1885": 93, 1886 (see Massalongo 1886).

Marsupella media (Gottsche) Schiffn., *Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag* 49: 123, 1901 (see Schiffner 1901).

Marsupella sphacelata f. *media* (Gottsche) R.M.Schust., *Hepat. Anthocerotae N. Amer.* 3: 59, 1974 (see Schuster 1974).

***Sarcocyphos sullivantii* De Not.**, *Comment. Soc. Crittog. Ital*. 1: 84, 1861 (see De Notaris 1861), "*Sarcoscyphus*". Type: USA: New Hampshire: montibus Albis, leg. *Oakes*; North Carolina: monte Balsam, leg. *Sullivant* (typification needed). Syn. in Müller 1909b.

Nardia sullivantii (De Not.) Trevis., *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 400, 1877 (see Trevisan 1877), "*sullivanti*".

Marsupella sullivantii (De Not.) A.Evans, *Rhodora* 9: 57, 1907 (see Evans 1907).

Marsupella sphacelata var. β *sullivantii* (De Not.) C.Massal., *Atti Reale Ist. Veneto Sci. Lett. Arti*. 69: 147, 1909 (see Massalongo 1909).

Marsupella sullivantii var. *sullivantii*, *Lotos* 58: 267, 1910 (see Schiffner 1910c).

****Sarcocyphos ehrhardtii* f. *obtusus* Carrington**, *Brit. Hep*. 1: 13, 1874 (see Carrington 1874), *nom. inval.* (Art. 34.1.c; sub *Nardia emarginata*), "*Sarcoscyphus Erharti* f. *obtusa*". Cited material: POLAND: Riesengebirge, am Kleinen Teich, 1862, leg. *Hilse*. * *Syn. nov.*

****Sarcocyphos jackii* Limpr.**, *Krypt.-Fl. Schlesien* "1876": 248, 1877 (see Limpricht 1877), *nom. inval.* (Art. 34.1.b; provisional name), "*Sarcoscyphus*". Cited material: cf. *Sarcocyphos ehrhardtii* var. c. *erythrorhizus*. *Syn. with *M. sullivantii* in Müller 1909b.

Marsupella jackii (Limpr.) Loeske, *Hedwigia* 47: 161, 1908 (see Loeske 1908).

***Sarcocyphos ehrhardtii* c *erythrorhizus* Limpr.**, *Krypt.-Fl. Schlesien* "1876": 248, 1877 (see Limpricht 1877), "*Sarcoscyphus Ehrharti*". Type: many syntypes (typification needed). Syn. in Müller 1909b.

Sarcocyphos sphacelatus b *erythrorhizus* (Limpr.) Limpr., *Krypt.-Fl. Schlesien* "1876": 432, 1877 (see Limpricht 1877), "*Sarcoscyphus*".

Marsupella sphacelata var. *erythrorhiza* (Limpr.) Loitl., *Ann. Naturhist. Mus. Wien* 13: 192, 1898 (see Loitlesberger 1898).

Marsupella erythrorhiza f. *erythrorhiza*, *Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag n.s*. 48: 323, 1900 (see Schiffner 1900).

Marsupella erythrorhiza (Limpr.) Schiffn., *Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag n.s*. 48: 323, 1900 (see Schiffner 1900).

Marsupella erythrorhiza var. *erythrorhiza*, *Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag n.s*. 53: 141, 1905 (see Schiffner 1905b).

***Marsupella sphacelata* α *minor* Bernet**, *Cat. Hép. Suisse*: 28, 1888 (see Bernet 1888). Type: SWITZERLAND: Bel-Oiseau (typification needed). *Syn. nov.*

Marsupella sphacelata var. α *minor* (Bernet) Boulay, *Musc. France* 2: 145, 1904 (see Boulay 1904).

****Marsupella sphacelata* β *robustior* Bernet**, *Cat. Hép. Suisse*: 28, 1888 (see Bernet 1888), *nom. illeg.* (Art. 52.1; the earlier *Sarcocyphos ehrhardtii* c. *erythrorhizus* Limpr. 1877 included). Type: FRANCE: Haute-Savoie: Brevent. *Syn. nov.*

****Sarcocyphos sphacelatus* f. *pusillus* Parrique**, *Rev. Bryol*. 20: 90, 1893 (see Parrique 1893), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus sphacelatus* f. *pusilla*". Cited material: FRANCE: Puy Violent. * *Syn. nov.*

***Hygrobiella japonica* Steph.**, *Bull. Herb. Boiss*. 5: 92, 1897 (see Stephani 1897). Type: JAPAN: Kattasan, 1894, leg. *Faurie* (G-15395, holotype). Syn. in Kitagawa 1963.

***Marsupella erythrorhiza* f. *nana* Schiffn.**, *Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag n.s*. 48: 323, 1900 (see Schiffner 1900). Type: CZECH REPUBLIC: Riesengebirge, 1895, leg. *Schmidt* (typification needed). *Syn. nov.*

***Marsupella joergensenii* Schiffn.**, *Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag* 49: 125, 1901 (see Schiffner 1901). Type: NORWAY: Rogaland: between Frafjord and Dirdal, 1899, leg. *Jørgensen* (typification needed). Syn. in Müller 1958.

Marsupella sphacelata var. γ *joergensenii* (Schiffn.) Schiffn., *Lotos* 58: 255, 1910 (see Schiffner 1910d).

Marsupella joergensenii f. *joergensenii*, *Bergens Mus. Skr. n.s.* 16: 81, 1934 (see Jørgensen 1934).

Marsupella sphacelata f. *joergensenii* (Schiffn.) R.M.Schust., *Hepat. Anthocerotae N. Amer.* 3: 63, 1974 (see Schuster 1974).

***Marsupella sphacelata* var. *arduennensis* Boulay**, *Musc. France* 2: 145, 1904 (see Boulay 1904). Type: FRANCE: Dames-de-Meuse; entre Revin et Fumay, leg. *Cardot*; BELGIUM: valée de Statte, leg. *Sladden* (typification needed). *Syn. nov.*

***Marsupella erythrorhiza* f. *brevicaulis* Schiffn.**, *Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag n.s.* 53: 16, 1905 (see Schiffner 1905a). Type: CZECH REPUBLIC: Riesengebirge, leg. *Schiffner* (typification needed). *Syn. nov.*

Marsupella erythrorhiza var. *brevicaulis* (Schiffn.) Schiffn., *Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag n.s.* 53: 141, 1905 (see Schiffner 1905b).

***Marsupella erythrorhiza* f. *gracilescens* Schiffn.**, *Sitzungsber. Deutsch. Naturwiss.-Med. Vereins Böhmen "Lotos" Prag n.s.* 53: 17, 1905 (see Schiffner 1905a). Type: CZECH REPUBLIC: Riesengebirge, leg. *Schiffner* (typification needed). *Syn. nov.*

****Marsupella sphacelata* var. *inundata* Müll.Frib.**, *Rabenh. Krypt.-Fl., ed*. 2, 6 (8): 487, 1909 (see Müller 1909b), *nom. inval.* (Art. 32.1.d; no description). Cited material: s. loc. cit. * *Syn. nov.*

****Marsupella sphacelata* var. β *eusphacelata* Schiffn.**, *Lotos* 58: 255, 1910 (see Schiffner 1910d), *nom. illeg.* (Art. 24.3, 63.1; type of species included). Type: s. loc. cit. "*Sarcoscyphus sphacelatus* in Limpricht; Schiffner Exsicc. n.49; K. Müller, etc.". *Syn. nov.*

***Marsupella sullivantii* f. *brevicaulis* Schiffn.**, *Lotos* 58: 267, 1910 (see Schiffner 1910c). Type: CZECH REPUBLIC: Riesengebirge, zw. Wiesenbaude und dem Hochwiesenberge, 1904, leg. *Schiffner* (typification needed). *Syn. nov.*

***Marsupella sullivantii* f. *gracilescens* Schiffn.**, *Lotos* 58: 267, 1910 (see Schiffner 1910c). Type: CZECH REPUBLIC: Riesengebirge, Koppenplane, 1904, leg. *Schiffner* (typification needed). *Syn. nov.*

***Sarcocyphos grandiretis* Warnst.**, *Hedwigia* 57 "1915": 62, 1916 (see Warnstorf 1916), "*Sarcoscyphus*". Type: GERMANY: Bayern: Allgäu, Sonthofen, 1886, leg. *Holler 263* (typification needed). Syn. in Müller 1958.

***Marsupella sphacelata* var. *rosea* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s.* 16: 80, 1934 (see Jørgensen 1934). Type: NORWAY: Nordland: Bryggefjell, leg. *Kaalaas* (typification needed). *Syn. nov.*

****Marsupella joergensenii* f. *gracilior* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s.* 16: 81, 1934 (see Jørgensen 1934), *nom. inval.* (Art. 32.1.d; no description). Cited material: NORWAY: Aust-Agder: Meienfjell. * *Syn. nov.*

****Marsupella joergensenii* f. *gracilis* Bryhn ex Jørg.**, *Bergens Mus. Skr. n.s.* 16: 81, 1934 (see Jørgensen 1934), *nom. inval.* (Art. 32.1.d; no description). Cited material: NORWAY: Aust-Agder: Meienfjell, 1897, leg. *Bryhn*. Note: it is possible that this is an orthographic error for var. *gracilior* Kaal. ex Jørg. (from the same locality) but Jørgensen (1934) ascribe this taxon to Bryhn in his list of specimens. **Syn. nov.*

***Marsupella joergensenii* f. *nivalis* Jørg.**, *Bergens Mus. Skr. n.s.* 16: 81, 1934 (see Jørgensen 1934). Type: NORWAY: Hordaland: Kvam, 1903, leg. *Kaalaas* (typification needed). *Syn. nov.*

***Marsupella joergensenii* f. *densiretis* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s.* 16: 81, 1934 (see Jørgensen 1934). Type: NORWAY: without locality (typification needed). *Syn. nov.*

****Marsupella affinis* Kaal. ex Jørg.**, *Bergens Mus. Skr. n.s.* 16: 81, 1934 (see Jørgensen 1934), *nom. inval.* (Art. 34.1.c; sub *M. joergensenii*). Cited material: NORWAY: Møre og Romsdal: Tusten, 1892, leg. *Kaalaas*. * *Syn. nov.*

****Marsupella sphacelata* f. *inaequalis* H.Buch**, *Rev. Bryol. Lichénol.* 10: 48, 1937 (see Buch 1937), *nom. inval.* (Art. 36.1; no Latin description). Cited material: SPAIN: Galicia: Pontevedra. * *Syn. nov.*

***Marsupella aequiloba* Steph. ex Bonner**, *Candollea* 14: 253, 1953 (see Bonner 1953b). Type: JAPAN: Hokkaido: Echigo, leg. *Okamura* (G-15029, holotype). Syn. in Kitagawa 1963.

****Marsupella sphacelata* f. *densiretis* Kaal. ex S.W.Arnell**, *Ill. Moss Fl. Fennosc. Hep.*: 240, 1956 (see Arnell 1956a), *nom. inval.* (Art. 36.1; no Latin description). Cited material: s. loc. cit. * *Syn. nov.*

***Marsupella sphacelata* f. *bifida* R.M.Schust.**, *Hepat. Anthocerotae N. Amer.* 3: 64, 1974 (see Schuster 1974). Type: USA: North Carolina: Glenn Falls, leg. *Schuster* (F, holotype). *Syn. nov.*

Marsupella spiniloba R.M.Schust. et Damsh. (***)

Distribution:—Northern Europe, Eastern Europe, Subarctic America.

***Marsupella spiniloba* R.M.Schust. et Damsh.**, *Phytologia* 63: 326, 1987 (see Schuster & Damsholt 1987). Type: GREENLAND: Fredriksdal, leg. *Schuster & Damsholt* (F, holotype).

Marsupella sprucei (Limpr.) Bernet (***)

Distribution:—Northern Europe, Middle Europe, Southwestern Europe, Southeastern Europe, Eastern Europe, Macaronesia, Siberia, Russian Far East, China, New Zealand, Subarctic America, Western Canada, Eastern Canada, Northwestern USA, Northeastern USA, Southwestern USA, Southern South America, Subantarctic Islands.

***Sarcocyphos sprucei* Limpr.**, *Flora* 64: 72, 1881 (see Limpricht 1881a), "*Sarcoscyphus*". Type: GERMANY: Bayern: Fichtelgebirge, leg. *Funck* (BP, holotype).

Sarcocyphos sprucei var. *sprucei*, *Flora* 64: 76, 1881 (see Limpricht 1881a).

Nardia sprucei (Limpr.) C.Massal. et Carestia, *Nuovo Giorn. Bot. Ital*. 14: 222, 1882 (see Massalongo & Carestia 1882).

Marsupella sprucei (Limpr.) Bernet, *Cat. Hép. Suisse*: 33, 1888 (see Bernet 1888).

**Marsupella ustulata* subsp. *sprucei* (Limpr.) Meyl., *Beitr. Kryptogamenfl. Schweiz* 6(4): 132, 1924 (see Meylan 1924), *nom. illeg.* (species combination illegitimate but the situation not covered by the ICBN).

**Marsupella ustulata* var. *sprucei* (Limpr.) R.M.Schust., *Hepat. Anthocerotae N. Amer.* 3: 30, 1974 (see Schuster 1974), *nom. illeg.* (species combination illegitimate but the situation not covered by the ICBN).

**Marsupella ustulata* f. *sprucei* (Limpr.) Schljakov, *Novosti Sist. Nizsh. Rast*. 12: 317, 1975 (see Schljakov 1975), *nom. illeg.* (species combination illegitimate but the situation not covered by the ICBN).

Marsupella sprucei var. *sprucei*, *Ill. Fl. Nord. Liverw. Hornw.*: 262, 2002 (see Damsholt 2002).

***Marsupella ustulata* Spruce**, *Rev. Bryol*. 8: 100, 1881 (see Spruce 1881b). Type: FRANCE: Midi-Pyrenées: Bagnieres de Bigorre, 1846, leg. *Spruce* (MANCH, lectotype by Grolle 1976a). Syn. in Grolle 1976a.

Nardia ustulata (Spruce) Lindb., *Morgonbladet (Helsinki) 1882 (288) 11 Dec*.: 3, 1882 (see Lindberg 1882).

Sarcocyphos ustulatus (Spruce) Kiaer, *Forh. Vidensk.-Selsk. Kristiania* 1884 (12): 82, 1885 (see Kiaer 1885).

Sarcocyphos neglectus var. *ustulatus* (Spruce) Breidl., *Mitt. Naturwiss. Vereins Steiermark* 30: 283, 1894 (see Breidler 1894).

Marsupella ustulata var. *ustulata*, *Rabenh. Krypt.-Fl., ed.* 2, 6 (8): 457, 1909 (see Müller 1909b).

**Marsupella ustulata* f. *ustulata*, *Novosti Sist. Nizsh. Rast*. 12: 317, 1975 (see Schljakov 1975), *nom. inval*. (none of the proposed formas are valid).

**Marsupella sprucei* f. *ustulata* (Spruce) Schljakov, *Petjen. Mchi Sev. SSSR* 4: 94, 1981 (see Schljakov 1981), *nom. inval*. (Art. 33.4; basionym not indicated).

Marsupella sprucei var. *ustulata* (Spruce) Damsh., *Ill. Fl. Nord. Liverw. Hornw.*: 262, 2002 (see Damsholt 2002).

***Sarcocyphos neglectus* Limpr.**, *Jahresber. Schles. Ges. Vaterl. Cult*. 58 "1880": 180, 1881 (see Limpricht 1881b), "*Sarcoscyphus*". Type: AUSTRIA: Salzburg: Lungau, 1878, leg. *Breidler* (BP 5.943, lectotype). Syn. in Grolle 1976a.

Marsupella neglecta (Limpr.) Lindb., *Meddel. Soc. Fauna Fl. Fenn*. 14 "1888": 67, 1887 (see Lindberg 1887a).

Sarcocyphos neglectus var. *neglectus*, *Mitt. Naturwiss. Vereins Steiermark* 30: 283, 1894 (see Breidler 1894).

Marsupella ustulata var. *neglecta* (Limpr.) Müll.Frib., *Rabenh. Krypt.-Fl., ed.* 2, 6 (8): 457, 1909 (see Müller 1909b).

**Marsupella ustulata* f. *neglecta* (Limpr.) R.M.Schust., *Hepat. Anthocerotae N. Amer.* 3: 25, 1974 (see Schuster 1974), *nom. inval.* (Art. 33.4; basionym not indicated).

Marsupella sprucei var. *neglecta* (Limpr.) Damsh., *Ill. Fl. Nord. Liverw. Hornw.*: 262, 2002 (see Damsholt 2002).

***Sarcocyphos sprucei* var. *decipiens* Limpr.**, *Flora* 64: 76, 1881 (see Limpricht 1881a). Type: CZECH REPUBLIC: Riesengebirge, Weisenbaude, 1870, leg. *Limpricht* (BP 5.931/h, holotype). Syn. in Müller 1909b.

***Nardia gracilis* C.Massal. et Carestia**, *Nuovo Giorn. Bot. Ital*. 14: 221, 1882 (see Massalongo & Carestia 1882). Type: ITALY: Piemonte, Ilagna-Vals, 1881, leg. *Carestia* (TO, lectotype by Grolle 1976a). Syn. in Müller 1956.

Marsupella gracilis (C.Massal. et Carestia) Pearson, *J. Bot*. 22: 226, 1884 (see Pearson 1884).

****Marsupella repens* Lindb. ex Müll.Frib.**, *Rabenh. Krypt.-Fl., ed.* 2, 6 (8): 456, 1909 (see Müller 1909b), *nom. inval.* (Art. 32.1.d, 34.1.c; no description, sub *Marsupella ustulata*). Cited material: s. loc. cit. *Syn. in Müller 1909b.

****Marsupella sprucei* f. *viridis* Limpr. ex Schiffn.**, *Lotos* 58: 255, 1910 (see Schiffner 1910d), *nom. inval.* (Art. 32.1.d; no description). Cited material: POLAND: Riesengebirge, Kl. Teiches, 1882, leg. *Limpricht*. * *Syn. nov.*

****Marsupella ustulata* var. *squarrosula* Lindb. ex J.Perss.**, *Bot. Not*. 1920: 102, 1920 (see Persson 1920), *nom. inval.* (Art. 32.1.d; no description). Cited material: SWEDEN: Västmanland: Perstorp. * *Syn. nov.*

Marsupella stableri Spruce (**)

Distribution:—Northern Europe, Western Canada.

Note:—*syn.* (*nov*.) with *M. boeckii* in Schuster (1974) but recognized by Grolle & Long (2000). When describing the species, Spruce also used the name "*Nardia* (*Marsupella*) *stableri*" but it is clear from his discussion that he intended to recognize it as a species of *Marsupella* and thus the name *Nardia stableri* Spruce does not exist.

***Marsupella stableri* Spruce**, *Rev. Bryol*. 8: 96, 1881 (see Spruce 1881b). Type: UK: England: Westmorland, 1881, leg. *Stabler* (MANCH, lectotype by Grolle 1976b).

Marsupella boeckii var. *stableri* (Spruce) R.M.Schust., *Hepat. Anthocerotae N. Amer.* 3: 107, 1974 (see Schuster 1974).

Marsupella stoloniformis N.Kitag. (***)

Distribution:—Eastern Asia, Indian Subcontinent, Malesia, Papuasia.

***Marsupella stoloniformis* N.Kitag.**, *J. Hattori Bot. Lab*. 30: 201, 1967 (see Kitagawa 1967). Type: MALAYSIA: Borneo, Sabah: Kinabalu, leg. *Mizutani* (NICH-252788, holotype).

Poeltia stoloniformis (N.Kitag.) R.M.Schust., *Nova Hedwigia* 15: 501, 1968 (see Schuster 1968).

Marsupella stoloniformis subsp. *stoloniformis* (**)

Distribution:—Indian Subcontinent, Malesia.

Marsupella stoloniformis subsp. *stoloniformis*, *J. Hattori Bot. Lab*. 80: 72, 1996 (see Schuster 1996a).

Marsupella stoloniformis subsp. *vermiformis* R.M.Schust. (**)

Distribution:— Eastern Asia, Malesia, Papuasia.

***Marsupella stoloniformis* subsp. *vermiformis* R.M.Schust.**, *J. Hattori Bot. Lab*. 80: 72, 1996 (see Schuster 1996a). Type: PAPUA NEW GUINEA: Mt. Wilhelm, leg. *Schuster* (F, holotype).

Marsupella yakushimensis (Horik.) S.Hatt. (***)

Distribution:—China, Eastern Asia, Indo-China.

***Sphenolobus yakushimensis* Horik.**, *J. Sci. Hiroshima Univ. Ser. B, Div. 2, Bot*. 2: 156, 1934 (see Horikawa 1934). Type: JAPAN: Kyushu: Yakushima, 1933, leg. *Horikawa* (HIRO-11895, holotype).

Marsupella yakushimensis (Horik.) S.Hatt., *Bull. Tokyo Sci. Mus*. 11: 80, 1944 (see Hattori 1944a).

****Marsupella fauriana* Steph. ex N.Kitag.**, *J. Hattori Bot. Lab*. 26: 95, 1963 (see Kitagawa 1963), *nom. inval.* (Art. 32.1.d, 34.1.c; no description, sub *M. yakushimensis*). Cited material: JAPAN: leg. *Faurie 738*. *Syn. in Kitagawa 1963.

Nanomarsupella R.M.Schust.

***Marsupella* subgen. *Nanomarsupella* R.M.Schust.**, *Phytologia* 39: 248, 1978 (see Schuster 1978). Type: *Marsupella xenophylla* R.M.Schust. (≡*Nanomarsupella xenophylla* (R.M.Schust.) R.M.Schust.)

Nanomarsupella (R.M.Schust.) R.M.Schust., *J. Hattori Bot. Lab*. 80: 128, 1996 (see Schuster 1996a).

Nanomarsupella xenophylla (R.M.Schust.) R.M.Schust. (***)

Distribution:—Northern South America, Western South America.

***Marsupella xenophylla* R.M.Schust.**, *Phytologia* 39: 248, 1978 (see Schuster 1978). Type: VENEZUELA: Mérida:

Sierra de Mérida: leg. *Schuster & Ruiz-Teran* (F, lectotype by Schuster 1996a).
Nanomarsupella xenophylla (R.M.Schust.) R.M.Schust., *J. Hattori Bot. Lab*. 80: 132, 1996 (see Schuster 1996a).

Nothogymnomitrion R.M.Schust.

***Nothogymnomitrion* R.M.Schust.**, *J. Hattori Bot. Lab*. 80: 43, 1996 (see Schuster 1996a). Type: *Nothogymnomitrion erosum* (Carrington et Pearson) R.M.Schust.

Nothogymnomitrion erosum (Carrington et Pearson) R.M.Schust. (***)

Distribution:—Australia, New Zealand, Southern South America, Subantarctic Islands.

***Cesius erosus* Carrington et Pearson**, *Pap. & Proc. Roy. Soc. Tasmania* 1887: 8, 1888 (see Carrington & Pearson 1888), "*Cesia erosa*". Type: AUSTRALIA: Tasmania: leg. *Boswell* (BM, lectotype by Grolle 1966c).
Gymnomitrion erosum (Carrington et Pearson) Bastow, *Pap. & Proc. Roy. Soc. Tasmania* 1887: 244, 1888 (see Bastow 1888), "*Gymnomitrium erosa*".
Herzogobryum erosum (Carrington et Pearson) Grolle, *Österr. Bot. Z.* 113: 231, 1966 (see Grolle 1966c).
Nothogymnomitrion erosum (Carrington et Pearson) R.M.Schust., *J. Hattori Bot. Lab*. 80: 44, 1996 (see Schuster 1996a).
***Cesius stygius* var. *denticulatus* Berggr.**, *New Zealand Hepat*.: 4, 1898 (see Berggren 1898), "*Cesia stygia* var. *denticulata*". Type: NEW ZEALAND: South Island: Kelly's Hill, 1874, leg. *Berggren* (LD, lectotype by Grolle 1966c). Syn. (*nov.*) in Grolle 1966c.
Acolea denticulata (Berggr.) Steph., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 143 (4), 1901 (see Stephani 1901).
Gymnomitrion denticulatum (Berggr.) Müll.Frib., *Rev. Bryol. Lichénol*. 20: 177, 1951 (see Müller 1951b).

Paramomitrion R.M.Schust.

***Paramomitrion* R.M.Schust.**, *J. Hattori Bot. Lab*. 80: 134, 1996 (see Schuster 1996a). Type: *Paramomitrion paradoxum* R.M.Schust.

Paramomitrion paradoxum R.M.Schust. (***)

Distribution:—Northern South America.

***Paramomitrion paradoxum* R.M.Schust.**, *J. Hattori Bot. Lab*. 80: 135, 1996 (see Schuster 1996a). Type: VENEZUELA: Mérida: Sierra Nevada de Mérida, leg. *Schuster & Ruiz-Teran* (F, holotype).

Poeltia Grolle

***Poeltia* Grolle**, *Khumbu Himal*: 280, 1966 (see Grolle 1966d). Type: *Poeltia campylata* Grolle
Marsupella subgen. *Poeltia* (Grolle) R.M.Schust., *J. Hattori Bot. Lab*. 80: 74, 1996 (see Schuster 1996a).

Poeltia campylata Grolle (***)

Distribution:—Indian Subcontinent.

***Poeltia campylata* Grolle**, *Khumbu Himal*: 280, 1966 (see Grolle 1966d). Type: NEPAL: Rauje, leg. *Poelt* (M, holotype).
Marsupella campylata (Grolle) R.M.Schust., *J. Hattori Bot. Lab*. 80: 75, 1996 (see Schuster 1996a).

Prasanthus Lindb.

****Cesius* sect. c. *Prasanthus* Lindb.**, *Musci Scand*.: 9, 1879 (see Lindberg 1879), *nom. inval.* (Art. 32.1.d; no description), "*Cesia*". Cited taxon: *Cesius suecicus* (Gottsche) Lindb. (≡*Prasanthus suecicus* (Gottsche) Lindb.)
****Cesius* subgen. C *Prasanthus* Lindb.**, *Finland 1885 (290) 13 Dec*.: 2, 1885 (see Lindberg 1885), *nom. inval.* (Art.

32.1.d; no description), "*Cesia*". Cited taxon: *Cesius*

***Prasanthus* Lindb.**, *Kungl. Svenska Vetenskapsakad. Handl*. 23 (5): 62, 1889 (see Lindberg & Arnell 1889). Type: *Prasanthus suecicus* (Gottsche) Lindb.

***Prasanthus* sect. *Pseudonardia* Potemkin**, *Ann. Bot. Fenn*. 29: 322, 1992 (see Potemkin 1992). Type: *Prasanthus jamalicus* Potemkin

Prasanthus jamalicus Potemkin (**)

Distribution:—Siberia.

***Prasanthus jamalicus* Potemkin**, *Ann. Bot. Fenn*. 29: 319, 1992 (see Potemkin 1992). Type: RUSSIA: Yamal-Nenets, Khutyyaha river basin, 1977, leg. *Andrejeva* (LE, holotype).

Prasanthus suecicus (Gottsche) Lindb. (***) Fig. 1.

Distribution:— Northern Europe, Middle Europe, Southwestern Europe, Eastern Europe, Siberia, Russian Far East, Subarctic America, Eastern Canada. Erroneously reported from Southeastern Europe.

***Gymnomitrion suecicum* Gottsche**, *Fl. Danica* 16 (48): 20, 1871 (see Lange 1871), "*Gymnomitrium*". Type: SWEDEN: Härjedalen: Helagsfjällen, 1853, leg. *Fristedt & Lovén* (H-SOL, syntypes fide Grolle 1976b; typification needed).

Cesius suecicus (Gottsche) Lindb., *Musci Scand*.: 10, 1879 (see Lindberg 1879), "*Cesia suecica*".

Acolea suecica (Gottsche) C.Massal. et Carestia, *Nuovo Giorn. Bot. Ital*. 14: 218, 1882 (see Massalongo & Carestia 1882).

Prasanthus suecicus (Gottsche) Lindb., *Kungl. Svenska Vetenskapsakad. Handl*. 23 (5): 62, 1889 (see Lindberg & Arnell 1889).

Notoscyphus suecicus (Gottsche) Steph., *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 173 (34), 1901 (see Stephani 1901).

Excluded taxa

***Acolea acinacifolia* (Hook.f. et Taylor) Trevis.**, *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 395, 1877 (see Trevisan 1877) ≡ *Syzygiella acinacifolia* (Hook.f. et Taylor) K.Feldberg, Váňa, Hentschel et Heinrichs (Adelanthaceae).

***Acolea argillacea* (Nees) Trevis.**, *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 395, 1877 (see Trevisan 1877) ≡ *Neesioscyphus argillaceus* (Nees) Grolle (Balantiopsaceae).

***Acolea belangeriana* (Lehm. et Lindenb.) Trevis.**, *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 395, 1877 (see Trevisan 1877) = *Notoscyphus lutescens* (Lehm. et Lindenb.) Mitt. (Geocalycaceae). Syn. in Schiffner 1898a.

***Acolea caledonica* Steph.**, *Nova Caledonia, Bot*. 1: 19, 1914 (see Stephani 1914) ≡ *Acromastigum caledonicum* (Steph.) Grolle (Lepidoziaceae).

***Acolea carnea* (Nees) Trevis.**, *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 395, 1877 (see Trevisan 1877) ≡ *Neesioscyphus carneus* (Nees) Grolle (Balantiopsaceae).

***Acolea erythrorhiza* (Bisch.) Trevis.**, *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 395, 1877 (see Trevisan 1877) = *Fossombronia angulosa* (Dicks.) Raddi (Fossombroniaceae). Syn. in Stephani 1900.

***Acolea formosae* Steph.**, *Spec. Hepat. (Stephani*) 6: 78, 1917 (see Stephani 1917) = *Cylindrocolea recurvifolia* (Steph.) Inoue (Cephaloziellaceae). Syn. in Hattori 1966b.

***Acolea lutescens* (Lehm. et Lindenb.) Trevis.**, *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 395, 1877 (see Trevisan 1877) ≡ *Notoscyphus lutescens* (Lehm. et Lindenb.) Mitt. (Geocalycaceae).

***Acolea ochrophylla* (Hook.f. et Taylor) Trevis.**, *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 395, 1877 (see Trevisan 1877) ≡ *Acrobolbus ochrophyllus* (Hook.f. et Taylor) R.M.Schust. (Acrobolbaceae).

***Acolea physocaula* (Taylor) Trevis.**, *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 395, 1877 (see Trevisan 1877) = *Metahygrobiella tubulata* (Hook.f. et Taylor) R.M.Schust. et J.J.Engel (Cephaloziaceae). Syn. in Stephani 1908.

***Acolea scariosa* (Lehm.) Trevis.**, *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 395, 1877 (see Trevisan 1877) ≡ *Gongylanthus scariosus* (Lehm.) Steph. (Arnelliaceae).

***Acolea stygia* (Hook.f. et Taylor) Trevis.**, *Mem. Reale Ist. Lombardo Sci., Ser. 3, C. Sci. Mat*. 4: 395, 1877 (see Trevisan

1877) = *Andrewsianthus perigonialis* (Hook.f. et Taylor) R.M.Schust. (Scapaniaceae). Syn. in Hamlin 1973.

***Cesius acinacifolius* (Hook.f. et Taylor) Kuntze**, *Revis. Gen. Pl.* 2: 833, 1891 (see Kuntze 1891), "*Cesiusa acinicifolia*". ≡ *Syzygiella acinacifolia* (Hook.f. et Taylor) K.Feldberg, Váňa, Hentschel et Heinrichs (Adelanthaceae).

***Cesius argillaceus* (Nees) Kuntze**, *Revis. Gen. Pl.* 2: 833, 1891 (see Kuntze 1891), "*Cesiusa argyllacea*". ≡ *Neesioscyphus argillaceus* (Nees) Grolle (Balantiopsaceae).

***Cesius belangeriana* (Lehm. et Lindenb.) Kuntze**, *Revis. Gen. Pl.* 2: 834, 1891 (see Kuntze 1891), "*Cesiusa*". = *Notoscyphus lutescens* (Lehm. et Lindenb.) Mitt. (Geocalycaceae). Syn. in Schiffner 1898a.

***Cesius carneus* (Nees) Kuntze**, *Revis. Gen. Pl.* 2: 834, 1891 (see Kuntze 1891), "*Cesiusa carnea*". ≡ *Neesioscyphus carneus* (Nees) Grolle (Balantiopsaceae).

***Cesius erythrorhizus* (Bisch.) Kuntze**, *Revis. Gen. Pl.* 2: 834, 1891 (see Kuntze 1891), "*Cesiusa erythrorhiza*". = *Fossombronia angulosa* (Dicks.) Raddi (Fossombroniaceae). Syn. in Stephani 1900.

***Cesius lutescens* (Lehm. et Lindenb.) Kuntze**, *Revis. Gen. Pl.* 2: 834, 1891 (see Kuntze 1891), "*Cesius*". ≡ *Notoscyphus lutescens* (Lehm. et Lindenb.) Mitt. (Geocalycaceae).

***Cesius ochrophyllus* (Hook.f. et Taylor) Kuntze**, *Revis. Gen. Pl.* 2: 834, 1891 (see Kuntze 1891), "*Cesiusa ochrophylla*". ≡ *Acrobolbus ochrophyllus* (Hook.f. et Taylor) R.M.Schust. (Acrobolbaceae).

***Cesius physocaulus* (Taylor) Kuntze**, *Revis. Gen. Pl.* 2: 834, 1891 (see Kuntze 1891), "*Cesiusa physocaula*". = *Metahygrobiella tubulata* (Hook.f. et Taylor) R.M.Schust. et J.J.Engel (Cephaloziaceae). Syn. in Stephani 1908.

***Cesius scariosus* (Lehm.) Kuntze**, *Revis. Gen. Pl.* 2: 834, 1891 (see Kuntze 1891), "*Cesius scariosa*". ≡ *Gongylanthus scariosus* (Lehm.) Steph. (Arnelliaceae).

***Cesius stygius* (Hook.f. et Taylor) Kuntze**, *Revis. Gen. Pl.* 2: 834, 1891 (see Kuntze 1891), "*Cesiusa stygia*". = *Andrewsianthus perigonialis* (Hook.f. et Taylor) R.M.Schust. (Scapaniaceae). Syn. in Hamlin 1973.

Cesius stygius* (Hook.f. et Taylor) Kuntze var. *stygius, *New Zealand Hepat.*: 4, 1898 (see Berggren 1898), "*Cesia stygia*". = *Andrewsianthus perigonialis* (Hook.f. et Taylor) R.M.Schust. (Scapaniaceae). Syn. in Hamlin 1973.

***Gymnomitrion acinacifolium* (Hook.f. et Taylor) Hook.f. et Taylor ex Gottsche, Lindenb. et Nees**, *Syn. Hepat*. 4: 616, 1846 (see Gottsche et al. 1846), "*Gymnomitrium*". ≡ *Syzygiella acinacifolia* (Hook.f. et Taylor) K.Feldberg, Váňa, Hentschel et Heinrichs (Adelanthaceae).

***Gymnomitrion argillaceum* (Nees) Gottsche**, *Syn. Hepat*. 1: 5, 1844 (see Gottsche et al. 1844), "*Gymnomitrium*". ≡ *Neesioscyphus argillaceus* (Nees) Grolle (Balantiopsaceae).

***Gymnomitrion argillaceum* (Nees) Gottsche α *major* (Nees) Gottsche**, *Syn. Hepat*. 1: 5, 1844 (see Gottsche et al. 1844), "*Gymnomitrium argillaceum* α *maius*". = *Neesioscyphus argillaceus* (Nees) Grolle (Balantiopsaceae). *Syn. nov.*

***Gymnomitrion argillaceum* (Nees) Gottsche β *minor* (Nees) Gottsche**, *Syn. Hepat*. 1: 5, 1844 (see Gottsche et al. 1844), "*Gymnomitrium argillaceum* α *minus*". = *Neesioscyphus argillaceus* (Nees) Grolle (Balantiopsaceae). *Syn. nov.*

***Gymnomitrion belangerianum* (Lehm. et Lindenb.) Gottsche**, *Syn. Hepat*. 1: 4, 1844 (see Gottsche et al. 1844), "*Gymnomitrium*". = *Notoscyphus lutescens* (Lehm. et Lindenb.) Mitt. (Geocalycaceae). Syn. in Schiffner 1898a.

***Gymnomitrion caledonicum* (Steph.) Horik.**, *Acta Phytotax. Geobot*. 13: 212, 1943 (see Horikawa 1943), "*Gymnomitrium calidonicae*". ≡ *Acromastigum caledonicum* (Steph.) Grolle (Lepidoziaceae).

***Gymnomitrion carneum* (Nees) Gottsche**, *Syn. Hepat*. 1: 5, 1844 (see Gottsche et al. 1844), "*Gymnomitrium*". ≡ *Neesioscyphus carneus* (Nees) Grolle (Balantiopsaceae).

***Gymnomitrion erythrorhizum* Bisch.**, *Fl. Azor.*: 12, 1844 (see Bischoff 1844) = *Fossombronia angulosa* (Dicks.) Raddi (Fossombroniaceae). Syn. in Stephani 1900.

***Gymnomitrion formosae* (Steph.) Horik.**, *J. Sci. Hiroshima Univ. Ser. B, Div. 2, Bot*. 2: 141, 1934 (see Horikawa 1934) = *Cylindrocolea recurvifolia* (Steph.) Inoue (Cephaloziellaceae). Syn. in Hattori 1966b.

***Gymnomitrion hookeri* (Lyell ex Sm.) Corda**, *Naturalientausch* 12: 651, 1829 (see Corda 1829) ≡ *Haplomitrium hookeri* (Lyell ex Sm.) Nees (Haplomitraceae).

***Gymnomitrion integerrimum* N.Kitag.**, *Acta Phytotax. Geobot*. 18: 36, 1959 (see Kitagawa 1959) = *Cryptocoleopsis imbricata* Amakawa (Solenostomataceae). Syn. in Inoue 1983.

****Gymnomitrion juniperinum* (Sw.) Corda**, *Naturalientausch* 12: 651, 1829 (see Corda 1829), *nom. illeg.* (Art. 52.1; type of earlier name included) = *Herbertus juniperoideus* (Sw.) Grolle (Herbertaceae). Syn. in .

***Gymnomitrion lutescens* (Lehm. et Lindenb.) Gottsche**, *Syn. Hepat*. 1: 4, 1844 (see Gottsche et al. 1844), "*Gymnomitrium*". ≡ *Notoscyphus lutescens* (Lehm. et Lindenb.) Mitt. (Geocalycaceae).

***Gymnomitrion ochrophyllum* (Hook.f. et Taylor) Taylor et Hook.f. ex Gottsche, Lindenb. et Nees**, *Syn. Hepat*. 4: 617, 1846 (see Gottsche et al. 1846) ≡ *Acrobolbus ochrophyllus* (Hook.f. et Taylor) R.M.Schust. (Acrobolbaceae).

***Gymnomitrion orbiculatum* Colenso**, *Trans. & Proc. New Zealand Inst*. 18: 236, 1886 (see Colenso 1886), "*Gymnomitrium orbiculata*". ≡ *Solenostoma orbiculatum* (Colenso) R.M.Schust. (Solenostomataceae).

***Gymnomitrion physocaulum* (Taylor) Taylor ex Gottsche, Lindenb. et Nees**, *Syn. Hepat*. 4: 615, 1846 (see Gottsche et al. 1846) = *Metahygrobiella tubulata* (Hook.f. et Taylor) R.M.Schust. et J.J.Engel (Cephaloziaceae). Syn. in

Stephani 1908.

***Gymnomitrion scariosum* (Lehm.) Nees**, *Syn. Hepat*. 1: 3, 1844 (see Gottsche et al. 1844), "*Gymnomitrium*". ≡ *Gongylanthus scariosus* (Lehm.) Steph. (Arnelliaceae).

***Gymnomitrion stygium* (Hook.f. et Taylor) Taylor et Hook.f. ex Gottsche, Lindenb. et Nees**, *Syn. Hepat*. 4: 616, 1846 (see Gottsche et al. 1846), "*Gymnomitrium*". = *Andrewsianthus perigonialis* (Hook.f. et Taylor) R.M.Schust. (Scapaniaceae). Syn. in Hamlin 1973.

***Herzogobryum aterrimum* (Steph.) Grolle**, *J. Bryol*. 11 "1980": 326, 1981 (see Grolle 1981) ≡ *Cephalomitrion aterrimum* (Steph.) R.M.Schust. (Cephaloziellaceae).

***Herzogobryum filarium* Grolle**, *Feddes Repert*. 86: 73, 1975 (see Grolle 1975) = *Cephalomitrion aterrimum* (Steph.) R.M.Schust. (Cephaloziellaceae). Syn. in Grolle 1981.

***Lophonardia caespitosa* R.M.Schust.**, *Phytologia* 39: 244, 1978 (see Schuster 1978) = *Hypolophozia laxifolia* (Mont.) Váňa et J.J.Engel (Scapaniaceae). Syn. in Engel & Gradstein 2003.

***Marsupella aurita* (Lehm.) Sim**, *Trans. Roy. Soc. South Africa* 15: 112, 1926 (see Sim 1926) ≡ *Anastrophyllum auritum* (Lehm.) Steph. (Anastrophyllaceae).

***Marsupella boeckii* (Austin) Lindb. ex Kaal. var. *ruwenzorensis* S.W.Arnell**, *Bot. Not*. 110: 24, 1957 (see Arnell 1957a) = *Nardia arnelliana* Grolle (Solenostomataceae). Syn. in Grolle 1964c.

***Marsupella crenulata* C.Massal. et Steph.**, *Atti Reale Ist. Veneto Sci. Lett. Arti*. 87: 236, 1928 (see Massalongo 1928), *nom. illeg.* (Art. 53.1; non Spruce 1881) = *Anastrophyllum auritum* (Lehm.) Steph. (Anastrophyllaceae). *Syn. nov.*

***Marsupella exigua* Steph.**, *Biblioth. Bot*. 87: 181, 1916 (see Stephani 1916) = *Anastrophyllum tubulosum* (Nees) Grolle (Anastrophyllaceae). Syn. in Gradstein et al. 2003.

***Marsupella fengchengensis* C.Gao**, *Fl. Hepat. Chin. Boreali-Orient*.: 206, 1981 (see Gao & Zhang 1981) = *Cylindrocolea tagawae* (N.Kitag.) R.M.Schust. (Cephaloziellaceae). Syn. in Váňa 1999.

***Marsupella gypsophylla* Dumort.**, *Recueil Observ. Jungerm*.: 24, 1835 (see Dumortier 1835), *nom. inval.* (Art. 32.1.d; no description) = *Sphenolobus minutus* (Schreb. ex Crantz) Berggr. (Anastrophyllaceae). Syn. in Müller 1909b.

***Marsupella kerguelena* (Schiffn.) Steph.**, *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 170 (31), 1901 (see Stephani 1901), "*kerguelensis*". = *Acrobolbus ochrophyllus* (Hook.f. et Taylor) R.M.Schust. (Acrobolbaceae). Syn. in Grolle 1964c.

***Marsupella obcordata* (Berggr.) Steph.**, *Bull. Herb. Boiss. ser. 2, 1 (Spec. Hep*. 2): 160 (21), 1901 (see Stephani 1901) ≡ *Scapania obcordata* (Berggr.) S.W.Arnell (Scapaniaceae).

***Marsupella polyanthos* (L.) Dumort.**, *Commentat. Bot. (Dumortier*): 114, 1822 (see Dumortier 1822) ≡ *Chiloscyphus polyanthos* (L.) Corda (Lophocoleaceae).

***Marsupella pusilla* Steph.**, *Biblioth. Bot*. 87: 181, 1916 (see Stephani 1916) = *Anastrophyllum auritum* (Lehm.) Steph. (Anastrophyllaceae). Syn. in Gradstein et al. 2003.

***Marsupella rikuchuna* Steph. ex Bonner**, *Candollea* 14: 250, 1953 (see Bonner 1953b) = *Gymnocolea inflata* (Huds.) Dumort. (Anastrophyllaceae). *Syn. nov.*

***Marsupella silvrettae* (Gottsche et Rabenh.) Gottsche ex Dumort.**, *Bull. Soc. Roy. Bot. Belgique* 13: 128, 1874 (see Dumortier 1874) = *Nardia geoscyphus* (De Not.) Lindb. (Solenostomataceae). Syn. in Váňa 1976a.

***Prasanthus paroicus* (Schiffn.) Kamim.**, *Contrib. Fl. Hepat. Shikokuensem*: 42, 1952 (see Kamimura 1952) = *Notoscyphus lutescens* (Lehm. et Lindenb.) Mitt. (Geocalycaceae). Syn. in Váňa & Inoue 1983.

***Sarcocyphos anomalus* J.B.Jack ex Gottsche et Rabenh.**, *Hepat. Eur., Leberm*. 45-47: n. 470, 1869 (see Gottsche & Rabenhorst 1869), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus*" = *Nardia geoscyphus* (De Not.) Lindb. (Solenostomataceae). Syn. in Váňa 1976a.

***Sarcocyphos auritus* (Lehm.) Nees**, *Syn. Hepat*. 1: 9, 1844 (see Gottsche et al. 1844), "*Sarcoscyphus*". ≡ *Anastrophyllum auritum* (Lehm.) Steph. (Anastrophyllaceae).

***Sarcocyphos decolorans* (Limpr.) Husn.**, *Rev. Bryol*. 7: 111, 1880 (see Husnot 1880), *nom. inval.* (Art. 32.1.d; no description), "*Sarcoscyphus*" ≡ *Isopaches decolorans* (Limpr.) H.Buch (Anastrophyllaceae).

***Sarcocyphos gypsophilus* (Wallr.) Nees**, *Naturgesch. Eur. Leberm*. 1: 140, 1833 (see Nees 1833), "*Sarcoscyphus*". = *Sphenolobus minutus* (Schreb. ex Crantz) Berggr. (Anastrophyllaceae). Syn. in Müller 1909b.

***Sarcocyphos kerguelenus* Schiffn.**, *Leberm., Forschungsr. Gazelle* 4 "1889": 2, 1890 (see Schiffner 1890), "*Sarcoscyphus*". = *Acrobolbus ochrophyllus* (Hook.f. et Taylor) R.M.Schust. (Acrobolbaceae). Syn. in Grolle 1964c.

***Sarcocyphos laxifolius* Mont.**, *Ann. Sci. Nat. Bot. (ser.* 3) 4: 346, 1845 (see Montagne 1845), "*Sarcoscyphus*". ≡ *Hypolophozia laxifolia* (Mont.) Váňa et J.J.Engel (Scapaniaceae).

***Sarcocyphos obcordatus* Berggr.**, *Kungl. Svenska Vetenskapsakad. Handl*. 13 (7): 96, 1875 (see Berggren 1875), "*Sarcoscyphus*". ≡ *Scapania obcordata* (Berggr.) S.W.Arnell (Scapaniaceae).

***Sarcocyphos perigonialis* (Hook.f. et Taylor) Taylor et Hook.f. ex Gottsche, Lindenb. et Nees**, *Syn. Hepat*. 4: 618, 1846 (see Gottsche et al. 1846), "*Sarcoscyphus*". ≡ *Andrewsianthus perigonialis* (Hook.f. et Taylor) R.M.Schust. (Scapaniaceae).

***Sarcocyphos silvrettae* (Gottsche ex Dumort.) Steph.**, *Ber. Bot. Vereines Landshut* 7: 109, 1879 (see Stephani 1879), "*Sarcoscyphus*". = *Nardia geoscyphus* (De Not.) Lindb. (Solenostomataceae). Syn. in Váňa 1976a.

Synopsis

Gymnomitriaceae H.Klinggr.

Acrolophozia **R.M.Schust.**
- ***A. fuegiana*** **R.M.Schust. (***)**
- ***A. pectinata*** **R.M.Schust. (***)**
- ***A. sulcata*** **Hässel (***)**

Apomarsupella **R.M.Schust.**
- ***A. africana*** **(Steph. ex Bonner) R.M.Schust. (***)**
- ***A. crystallocaulon*** **(Grolle) Váňa (***)**
- ***A. revoluta*** **(Nees) R.M.Schust. (***)**
  - **– subsp. *novoguineanensis* R.M.Schust. (**)**
  - **– subsp. *revoluta* (**)**
- ***A. rubida*** **(Mitt.) R.M.Schust. (***)**
- ***A. verrucosa*** **(W.E.Nicholson) Váňa (***)**

Gymnomitrion **Corda**
- ***G. adustum*** **Nees (***)**
- ***G. alpinum*** **(Gottsche ex Husn.) Schiffn. (***)**
- ***G. asperulatum*** **R.M.Schust. ex Váňa (***)**
- ***G. atrofilum*** **Váňa (***)**
- ***G. bolivianum*** **(Steph.) Váňa (***)**
- ***G. brevissimum*** **(Dumort.) Warnst. (***)**
- ***G. commutatum*** **(Limpr.) Schiffn. (***)**
- ***G. concinnatum*** **(Lightf.) Corda (***)**
- ***G. corallioides*** **Nees (***)**
- ***G. crenatilobum*** **Grolle (***)**
- ***G. crenulatum*** **Gottsche ex Carrington (***)**
- ***G. incompletum*** **(Gottsche) R.M.Schust. ex Váňa (**)**
- ***G. laceratum*** **(Steph.) Horik. (***)**
- ***G. minutulum*** **(Hässel) Váňa (***)**
- ***G. moralesae*** **Váňa (**)**
- ***G. mucronulatum*** **(N.Kitag.) N.Kitag. (***)**
- ***G. mucrophorum*** **R.M.Schust. (**)**
- ***G. nigrum*** **(Grolle et Váňa) Váňa (***)**
- ***G. noguchianum*** **S.Hatt. (***)**
- ***G. obtusilobum*** **N.Kitag. (***)**
- ***G. obtusum*** **Lindb. (***)**
- ***G. pacificum*** **Grolle (***)**
- ***G. setaceum*** **Grolle et Váňa (***)**
- ***G. sinense*** **Müll.Frib. (***)**
- ***G. strictum*** **(Berggr.) R.M.Schust. (**)**
  - **– var. *inaequale* R.M.Schust. (**)**
  - **– var. *strictum* (**)**
- ***G. subintegrum*** **(S.W.Arnell) Váňa (***)**
- ***G. truncato-apiculatum*** **Herzog (***)**

Herzogobryum **Grolle**
- ***H. atrocapillum*** **(Hook.f. et Taylor) Grolle (***)**
- ***H. filiforme*** **R.M.Schust. (***)**
- ***H. molle*** **Grolle (***)**
- ***H. teres*** **(Carrington et Pearson) Grolle (***)**

H. vermiculare **(Schiffn.) Grolle (***)**

Marsupella **Dumort.**

M. alata **S.Hatt. et N.Kitag. ex N.Kitag. (***)**
M. andreaeoides **(Lindb.) Müll.Frib. (***)**
M. apiculata **Schiffn. (***)**
M. aquatica **(Lindenb.) Schiffn. (***)**
M. arctica **(Berggr.) Bryhn et Kaal. (***)**
M. boeckii **(Austin) Lindb. ex Kaal. (***)**
M. bolanderi **(Austin) Underw. (***)**
M. condensata **(Ångstr. ex C.Hartm.) Lindb. ex Kaal. (***)**
M. disticha **Steph. (***)**
M. emarginata **(Ehrh.) Dumort. (***)**
– subsp. ***emarginata*** **(**)**
– subsp. ***tubulosa*** **(Steph.) N.Kitag. (**)**
– subsp. ***tubulosa var. apertifolia*** **(Steph.) N.Kitag. (**)**
– subsp. ***tubulosa var. patens*** **N.Kitag. (**)**
– subsp. ***tubulosa var. tubulosa*** **(Steph.) N.Kitag. (**)**
M. funckii **(F.Weber et D.Mohr) Dumort. (***)**
M. microphylla **R.M.Schust. (***)**
M. miniata **(Lindenb. et Gottsche) Grolle (***)**
M. minutissima **N.Kitag. (**)**
M. neesii **Sande Lac. ex Schiffn. (***)**
M. paroica **R.M.Schust. (***)**
M. profunda **Lindb. (***)**
M. pseudofunckii **S.Hatt. (***)**
M. shimizuana **S.Hatt. (?)**
M. sparsifolia **(Lindb.) Dumort. (***)**
– subsp. ***childii*** **R.M.Schust. (?)**
– subsp. ***sparsifolia*** **(?)**
M. sphacelata **(Giesecke ex Lindenb.) Dumort. (***)**
M. spiniloba **R.M.Schust. et Damsh. (***)**
M. sprucei **(Limpr.) Bernet (***)**
M. stableri **Spruce (**)**
M. stoloniformis **N.Kitag. (***)**
– subsp. ***stoloniformis*** **(**)**
– subsp. ***vermiformis*** **R.M.Schust. (**)**
M. yakushimensis **(Horik.) S.Hatt. (***)**

Nanomarsupella **R.M.Schust.**

N. xenophylla **(R.M.Schust.) R.M.Schust. (***)**

Nothogymnomitrion **R.M.Schust.**

N. erosum **(Carrington et Pearson) R.M.Schust. (***)**

Paramomitrion **R.M.Schust.**

P. paradoxum **R.M.Schust. (***)**

Poeltia **Grolle**

P. campylata **Grolle (***)**

Prasanthus **Lindb.**

P. jamalicus **Potemkin (**)**
P. suecicus **(Gottsche) Lindb. (***)**

Summary of all names

Acolea acinacifolia (Hook.f. et Taylor) Trevis. ≡ *Syzygiella acinacifolia* (Hook.f. et Taylor) K.Feldberg, Váňa, Hentschel et Heinrichs
Acolea adusta (Nees) Trevis. ≡ *Gymnomitrion adustum* Nees
Acolea africana Steph. = *Apomarsupella africana* (Steph. ex Bonner) R.M.Schust.
Acolea alpina (Gottsche ex Husn.) C.Massal. ≡ *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
Acolea andina Herzog = *Gymnomitrion bolivianum* (Steph.) Váňa
Acolea andreaeoides (Lindb.) Steph. ≡ *Marsupella andreaeoides* (Lindb.) Müll.Frib.
Acolea argillacea (Nees) Trevis. ≡ *Neesioscyphus argillaceus* (Nees) Grolle
Acolea atrata (Mitt.) Mitt. = *Apomarsupella revoluta* (Nees) R.M.Schust.
Acolea atrocapilla (Hook.f. et Taylor) Steph. ≡ *Herzogobryum atrocapillum* (Hook.f. et Taylor) Grolle
Acolea belangeriana (Lehm. et Lindenb.) Trevis. = *Notoscyphus lutescens* (Lehm. et Lindenb.) Mitt.
Acolea breviloba Steph. = *Gymnomitrion concinnatum* (Lightf.) Corda
Acolea brevissima Dumort. ≡ *Gymnomitrion brevissimum* (Dumort.) Warnst.
Acolea caledonica Steph. ≡ *Acromastigum caledonicum* (Steph.) Grolle
Acolea carnea (Nees) Trevis. ≡ *Neesioscyphus carneus* (Nees) Grolle
Acolea cochlearis (Lindb.) Steph. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Acolea concinnata (Lightf.) Dumort. ≡ *Gymnomitrion concinnatum* (Lightf.) Corda
Acolea concinnata (Lightf.) Dumort. var. *intermedia* (Limpr.) Bernet = *Gymnomitrion concinnatum* (Lightf.) Corda
Acolea concinnata (Lightf.) Dumort. β *procumbens* (Nees) C.Massal. = *Gymnomitrion concinnatum* (Lightf.) Corda
Acolea concinnata (Lightf.) Dumort. f. *procumbens* (Nees) Bernet = *Gymnomitrion concinnatum* (Lightf.) Corda
Acolea concinnata (Lightf.) Dumort. f. *rufa* (Limpr.) Bernet = *Gymnomitrion concinnatum* (Lightf.) Corda
Acolea concinnata (Lightf.) Dumort. f. *viridis* (Limpr.) Bernet = *Gymnomitrion concinnatum* (Lightf.) Corda
Acolea conferta (Limpr.) C.Massal. et Carestia = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Acolea corallioides (Nees) Dumort. ≡ *Gymnomitrion corallioides* Nees
Acolea corallioides (Nees) Dumort. α *brevis* Bernet = *Gymnomitrion corallioides* Nees
Acolea corallioides (Nees) Dumort. β *elongata* Bernet = *Gymnomitrion corallioides* Nees
**Acolea corallioides* (Nees) Dumort. var. *intermedia* Bom. et Broth. *nom. inval.* = *Gymnomitrion corallioides* Nees
Acolea crassifolia (Carrington) Steph. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Acolea crassifolia (Carrington) C.Massal. et Carestia = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Acolea crenulata (Gottsche ex Carrington) Dumort. ≡ *Gymnomitrion crenulatum* Gottsche ex Carrington
Acolea cuspidata (Berggr.) Steph. = *Gymnomitrion incompletum* (Gottsche) R.M.Schust. ex Váňa
Acolea denticulata (Berggr.) Steph. = *Nothogymnomitrion erosum* (Carrington et Pearson) R.M.Schust.
Acolea erythrorhiza (Bisch.) Trevis. = *Fossombronia angulosa* (Dicks.) Raddi
Acolea fauriana Steph. = *Gymnomitrion corallioides* Nees
Acolea formosae Steph. = *Cylindrocolea recurvifolia* (Steph.) Inoue
Acolea lacerata Steph. ≡ *Gymnomitrion laceratum* (Steph.) Horik.
Acolea lutescens (Lehm. et Lindenb.) Trevis. ≡ *Notoscyphus lutescens* (Lehm. et Lindenb.) Mitt.
Acolea magellanica C.Massal. et Steph. = *Herzogobryum teres* (Carrington et Pearson) Grolle
Acolea miniata (Lindenb. et Gottsche) Trevis. ≡ *Marsupella miniata* (Lindenb. et Gottsche) Grolle
Acolea obtusa (Lindb.) C.Massal. et Carestia ≡ *Gymnomitrion obtusum* Lindb.
Acolea ochrophylla (Hook.f. et Taylor) Trevis. ≡ *Acrobolbus ochrophyllus* (Hook.f. et Taylor) R.M.Schust.
Acolea physocaula (Taylor) Trevis. = *Metahygrobiella tubulata* (Hook.f. et Taylor) R.M.Schust. et J.J.Engel
Acolea revoluta (Nees) Steph. ≡ *Apomarsupella revoluta* (Nees) R.M.Schust.
Acolea scariosa (Lehm.) Trevis. ≡ *Gongylanthus scariosus* (Lehm.) Steph.
Acolea stricta (Berggr.) Steph. ≡ *Gymnomitrion strictum* (Berggr.) R.M.Schust.
Acolea stygia (Hook.f. et Taylor) Trevis. = *Andrewsianthus perigonialis* (Hook.f. et Taylor) R.M.Schust.
Acolea suecica (Gottsche) C.Massal. et Carestia ≡ *Prasanthus suecicus* (Gottsche) Lindb.
Acolea varians (Lindb.) Steph. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Acrolophozia fuegiana R.M.Schust.
Acrolophozia pectinata R.M.Schust.
Acrolophozia sulcata Hässel
Anastrophyllum bolivianum Steph. ≡ *Gymnomitrion bolivianum* (Steph.) Váňa
Anastrophyllum merrillanum Steph. = *Apomarsupella revoluta* (Nees) R.M.Schust.
Anastrophyllum revolvens Herzog = *Apomarsupella revoluta* (Nees) R.M.Schust.
Apomarsupella africana (Steph. ex Bonner) R.M.Schust.
Apomarsupella crystallocaulon (Grolle) Váňa

Apomarsupella revoluta (Nees) R.M.Schust.
Apomarsupella revoluta (Nees) R.M.Schust. subsp. *novoguineanensis* R.M.Schust.
Apomarsupella rubida (Mitt.) R.M.Schust.
Apomarsupella verrucosa (W.E.Nicholson) Váňa
**Cephalozia divaricata* (Sm.) Dumort. var. *latifolia* (Lindb. ex Norrl.) Lindb. *nom. inval.* = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Cephalozia nevicensis (Carrington) C.Massal. = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Cesius acinacifolius (Hook.f. et Taylor) Kuntze ≡ *Syzygiella acinacifolia* (Hook.f. et Taylor) K.Feldberg, Váňa, Hentschel et Heinrichs
Cesius adustus (Nees) Carruth. ≡ *Gymnomitrion adustum* Nees
Cesius adustus (Nees) Carruth. var. *andreaeoides* (Lindb.) Jørg. ≡ *Marsupella andreaeoides* (Lindb.) Müll.Frib.
Cesius alpinus (Gottsche ex Husn.) Lindb. ≡ *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
Cesius alpinus (Gottsche ex Husn.) Lindb. f. *gracilis* Kaal. ex Jørg. = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
Cesius alpinus (Gottsche ex Husn.) Lindb. var. *heterophyllus* (Bernet) Jørg. = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
Cesius alpinus (Gottsche ex Husn.) Lindb. f. *laxior* (Gottsche et Rabenh.) Kaal. ex Jørg. = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
Cesius alpinus (Gottsche ex Husn.) Lindb. f. *pygmaeus* Kaal. ex Jørg. = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
Cesius andreaeoides Lindb. ≡ *Marsupella andreaeoides* (Lindb.) Müll.Frib.
Cesius apiculatus (Schiffn.) Bryhn ≡ *Marsupella apiculata* Schiffn.
Cesius argillaceus (Nees) Kuntze ≡ *Neesioscyphus argillaceus* (Nees) Grolle
Cesius atrocapillus (Hook.f. et Taylor) Mitt. ≡ *Herzogobryum atrocapillum* (Hook.f. et Taylor) Grolle
Cesius belangeriana (Lehm. et Lindenb.) Kuntze = *Notoscyphus lutescens* (Lehm. et Lindenb.) Mitt.
Cesius brevissimus (Dumort.) Pearson ≡ *Gymnomitrion brevissimum* (Dumort.) Warnst.
Cesius carneus (Nees) Kuntze ≡ *Neesioscyphus carneus* (Nees) Grolle
**Cesius cochlearis* (Lindb.) Lindb. *nom. inval.* = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Cesius cochlearis (Lindb.) Lindb. ex Kaal. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Cesius concinnatus (Lightf.) Gray ≡ *Gymnomitrion concinnatum* (Lightf.) Corda
Cesius concinnatus (Lightf.) Gray var. *ambiguus* Kaal. ex Jørg. = *Gymnomitrion concinnatum* (Lightf.) Corda
Cesius concinnatus (Lightf.) Gray var. *argenteus* Jørg. = *Gymnomitrion concinnatum* (Lightf.) Corda
Cesius concinnatus (Lightf.) Gray var. *bryhnii* Kaal. ex Jørg. = *Gymnomitrion concinnatum* (Lightf.) Corda
Cesius concinnatus (Lightf.) Gray var. *intermedius* (Limpr.) Jørg. = *Gymnomitrion concinnatum* (Lightf.) Corda
Cesius concinnatus (Lightf.) Gray var. *rufescens* Kaal. ex Jørg. = *Gymnomitrion concinnatum* (Lightf.) Corda
Cesius concinnatus (Lightf.) Gray var. *rufus* (Limpr.) Jørg. = *Gymnomitrion concinnatum* (Lightf.) Corda
Cesius condensatus (Ångstr. ex C.Hartm.) Lindb. ≡ *Marsupella condensata* (Ångstr. ex C.Hartm.) Lindb. ex Kaal.
Cesius confertus (Limpr.) Pearson = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Cesius corallioides (Nees) Carruth. ≡ *Gymnomitrion corallioides* Nees
**Cesius corallioides* (Nees) Carruth. var. β *intermedius* Lindb. *nom. inval.* = *Gymnomitrion corallioides* Nees
Cesius crassifolius (Carrington) Lindb. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Cesius crenulatus (Gottsche ex Carrington) Carruth. ≡ *Gymnomitrion crenulatum* Gottsche ex Carrington
Cesius crenulatus (Gottsche ex Carrington) Carruth. f. *rufescens* Bryhn = *Gymnomitrion crenulatum* Gottsche ex Carrington
Cesius cuspidatus Berggr. = *Gymnomitrion incompletum* (Gottsche) R.M.Schust. ex Váňa
Cesius erosus Carrington et Pearson ≡ *Nothogymnomitrion erosum* (Carrington et Pearson) R.M.Schust.
Cesius erythrorhizus (Bisch.) Kuntze = *Fossombronia angulosa* (Dicks.) Raddi
Cesius lutescens (Lehm. et Lindenb.) Kuntze ≡ *Notoscyphus lutescens* (Lehm. et Lindenb.) Mitt.
Cesius miniatus (Lindenb. et Gottsche) Kuntze ≡ *Marsupella miniata* (Lindenb. et Gottsche) Grolle
Cesius minor (Schleich. ex Lindb.) Schleich. ex Kuntze = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Cesius obtusus (Lindb.) Lindb. ≡ *Gymnomitrion obtusum* Lindb.
Cesius obtusus (Lindb.) Lindb. f. *alboviridis* Kaal. ex Jørg. = *Gymnomitrion obtusum* Lindb.
**Cesius obtusus* (Lindb.) Lindb. f. *argenteus* Kaal. ex Jørg. *nom. inval.* = *Gymnomitrion obtusum* Lindb.
**Cesius obtusus* (Lindb.) Lindb. var. *intermedius* Jørg. *nom. inval.* = *Gymnomitrion obtusum* Lindb.
Cesius ochrophyllus (Hook.f. et Taylor) Kuntze ≡ *Acrobolbus ochrophyllus* (Hook.f. et Taylor) R.M.Schust.
Cesius physocaulus (Taylor) Kuntze = *Metahygrobiella tubulata* (Hook.f. et Taylor) R.M.Schust. et J.J.Engel
Cesius revolutus (Nees) Lindb. ≡ *Apomarsupella revoluta* (Nees) R.M.Schust.
Cesius revolutus (Nees) Lindb. var. *gracilis* Bryhn ex Kaal. = *Apomarsupella revoluta* (Nees) R.M.Schust.
Cesius scariosus (Lehm.) Kuntze ≡ *Gongylanthus scariosus* (Lehm.) Steph.

Cesius strictus Berggr. ≡ *Gymnomitrion strictum* (Berggr.) R.M.Schust.
Cesius stygius (Hook.f. et Taylor) Kuntze = *Andrewsianthus perigonialis* (Hook.f. et Taylor) R.M.Schust.
Cesius stygius (Hook.f. et Taylor) Kuntze var. *denticulatus* Berggr. = *Nothogymnomitrion erosum* (Carrington et Pearson) R.M.Schust.
Cesius suecicus (Gottsche) Lindb. ≡ *Prasanthus suecicus* (Gottsche) Lindb.
Cesius varians (Lindb.) Lindb. ex Kaal. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
**Cesius varians* (Lindb.) Lindb. *nom. inval.* = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Cesius varians (Lindb.) Lindb. var. *cochlearis* (Lindb.) Jørg. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Cesius varians (Lindb.) Lindb. var. *crassifolius* (Carrington) Jørg. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Chondrophyllum cucullatum Herzog = *Herzogobryum vermiculare* (Schiffn.) Grolle
Dianthelia steerei R.M.Schust. = *Gymnomitrion laceratum* (Steph.) Horik.
Gymnomitrion acinacifolium (Hook.f. et Taylor) Hook.f. et Taylor ex Gottsche, Lindenb. et Nees ≡ *Syzygiella acinacifolia* (Hook.f. et Taylor) K.Feldberg, Váňa, Hentschel et Heinrichs
Gymnomitrion adustum Nees
Gymnomitrion adustum Nees var. *olivaceum* (Spruce) Macvicar = *Gymnomitrion adustum* Nees
Gymnomitrion africanum (Steph.) Horik. = *Apomarsupella africana* (Steph. ex Bonner) R.M.Schust.
Gymnomitrion alpinum (Gottsche ex Husn.) Schiffn.
Gymnomitrion alpinum (Gottsche ex Husn.) Schiffn. f. *heterophyllum* (Bernet) Müll.Frib. = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
Gymnomitrion alpinum (Gottsche ex Husn.) Schiffn. f. *laxior* (Gottsche et Rabenh.) Schiffn. = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
Gymnomitrion alpinum (Gottsche ex Husn.) Schiffn. var. *payotii* (Bernet) Zodda = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
**Gymnomitrion altissimum* R.M.Schust. *nom. inval.* = *Gymnomitrion incompletum* (Gottsche) R.M.Schust. ex Váňa
Gymnomitrion ambiguum Limpr. ex C.Massal. et Carestia = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Gymnomitrion andinum (Herzog) Herzog = *Gymnomitrion bolivianum* (Steph.) Váňa
**Gymnomitrion andinum* (Steph.) R.M.Schust. *nom. illeg.* = *Gymnomitrion bolivianum* (Steph.) Váňa
Gymnomitrion andreaeoides (Lindb.) Müll.Frib. ≡ *Marsupella andreaeoides* (Lindb.) Müll.Frib.
Gymnomitrion apiculatum (Schiffn.) Müll.Frib. ≡ *Marsupella apiculata* Schiffn.
**Gymnomitrion apiculatum* (Schiffn.) Müll.Frib. var. *laxior* S.W.Arnell *nom. inval.* = *Marsupella apiculata* Schiffn.
Gymnomitrion argillaceum (Nees) Gottsche ≡ *Neesioscyphus argillaceus* (Nees) Grolle
Gymnomitrion argillaceum (Nees) Gottsche α *major* (Nees) Gottsche = *Neesioscyphus argillaceus* (Nees) Grolle
Gymnomitrion argillaceum (Nees) Gottsche β *minor* (Nees) Gottsche = *Neesioscyphus argillaceus* (Nees) Grolle
Gymnomitrion asperulatum (R.M.Schust.) R.M.Schust. ex Váňa
**Gymnomitrion asperulatum* R.M.Schust. *nom. inval.* ≡ *Gymnomitrion asperulatum* (R.M.Schust.) R.M.Schust. ex Váňa
**Gymnomitrion atratum* (Mitt.) Parihar *nom. inval.* = *Apomarsupella revoluta* (Nees) R.M.Schust.
Gymnomitrion atrocapillum Hook.f. et Taylor ≡ *Herzogobryum atrocapillum* (Hook.f. et Taylor) Grolle
Gymnomitrion atrofilum Váňa
Gymnomitrion belangerianum (Lehm. et Lindenb.) Gottsche = *Notoscyphus lutescens* (Lehm. et Lindenb.) Mitt.
Gymnomitrion bolivianum (Steph.) Váňa
Gymnomitrion brevilobum (Steph.) Horik. = *Gymnomitrion concinnatum* (Lightf.) Corda
Gymnomitrion brevissimum (Dumort.) Warnst.
Gymnomitrion caledonicum (Steph.) Horik. ≡ *Acromastigum caledonicum* (Steph.) Grolle
Gymnomitrion carneum (Nees) Gottsche ≡ *Neesioscyphus carneus* (Nees) Grolle
Gymnomitrion cochleare (Lindb.) Müll.Frib. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Gymnomitrion commutatum (Limpr.) Schiffn.
Gymnomitrion concinnatum (Lightf.) Corda
Gymnomitrion concinnatum (Lightf.) Corda var. *ambiguum* (Kaal. ex Jørg.) S.W.Arnell = *Gymnomitrion concinnatum* (Lightf.) Corda
**Gymnomitrion concinnatum* (Lightf.) Corda var. *argenteum* (Jørg.) Müll.Frib. *nom. inval.* = *Gymnomitrion concinnatum* (Lightf.) Corda
**Gymnomitrion concinnatum* (Lightf.) Corda var. *bryhnii* (Kaal. ex Jørg.) Müll.Frib. *nom. inval.* = *Gymnomitrion concinnatum* (Lightf.) Corda
Gymnomitrion concinnatum (Lightf.) Corda b *crenulatum* (Gottsche ex Carrington) Limpr. ≡ *Gymnomitrion crenulatum* Gottsche ex Carrington
Gymnomitrion concinnatum (Lightf.) Corda f. *elongatum* Schiffn. = *Gymnomitrion concinnatum* (Lightf.) Corda
Gymnomitrion concinnatum (Lightf.) Corda var. *intermedium* Limpr. = *Gymnomitrion concinnatum* (Lightf.) Corda
Gymnomitrion concinnatum (Lightf.) Corda f. *laxum* Meyl. = *Gymnomitrion concinnatum* (Lightf.) Corda
Gymnomitrion concinnatum (Lightf.) Corda var. *mucronulatum* N.Kitag. ≡ *Gymnomitrion mucronulatum* (N.Kitag.)

N.Kitag.
Gymnomitrion concinnatum (Lightf.) Corda var. *obtusum* (Lindb.) Limpr. ≡ *Gymnomitrion obtusum* Lindb.
Gymnomitrion concinnatum (Lightf.) Corda f. *procumbens* (Nees) Limpr. = *Gymnomitrion concinnatum* (Lightf.) Corda
Gymnomitrion concinnatum (Lightf.) Corda β *procumbens* Nees = *Gymnomitrion concinnatum* (Lightf.) Corda
Gymnomitrion concinnatum (Lightf.) Corda var. *reflexum* Müll.Frib. = *Gymnomitrion concinnatum* (Lightf.) Corda
**Gymnomitrion concinnatum* (Lightf.) Corda var. *rufescens* (Kaal. ex Jørg.) Müll.Frib. *nom. inval.* = *Gymnomitrion concinnatum* (Lightf.) Corda
Gymnomitrion concinnatum (Lightf.) Corda f. *rufum* Limpr. = *Gymnomitrion concinnatum* (Lightf.) Corda
Gymnomitrion concinnatum (Lightf.) Corda f. *viride* Limpr. = *Gymnomitrion concinnatum* (Lightf.) Corda
Gymnomitrion condensatum Ångstr. ex C.Hartm. ≡ *Marsupella condensata* (Ångstr. ex C.Hartm.) Lindb. ex Kaal.
Gymnomitrion confertum (Limpr.) Limpr. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Gymnomitrion corallioides Nees
**Gymnomitrion corallioides* Nees var. *asperulum* S.Hatt. *nom. inval.* = *Gymnomitrion corallioides* Nees
Gymnomitrion corallioides Nees var. *faurianum* (Steph.) S.Hatt. = *Gymnomitrion corallioides* Nees
Gymnomitrion crassifolium Carrington = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Gymnomitrion crenatilobum Grolle
Gymnomitrion crenulatum Gottsche ex Carrington
Gymnomitrion crenulatum Gottsche ex Carrington f. *rufescens* (Bryhn) Müll.Frib. = *Gymnomitrion crenulatum* Gottsche ex Carrington
Gymnomitrion cuspidatum (Berggr.) R.M.Schust. = *Gymnomitrion incompletum* (Gottsche) R.M.Schust. ex Váňa
Gymnomitrion denticulatum (Berggr.) Müll.Frib. = *Nothogymnomitrion erosum* (Carrington et Pearson) R.M.Schust.
Gymnomitrion elgonense S.W.Arnell = *Gymnomitrion laceratum* (Steph.) Horik.
Gymnomitrion elgonense S.W.Arnell var. *squarrosum* S.W.Arnell = *Gymnomitrion laceratum* (Steph.) Horik.
Gymnomitrion erosum (Carrington et Pearson) Bastow ≡ *Nothogymnomitrion erosum* (Carrington et Pearson) R.M.Schust.
Gymnomitrion erythrorhizum Bisch. = *Fossombronia angulosa* (Dicks.) Raddi
Gymnomitrion faurianum (Steph.) Horik. = *Gymnomitrion corallioides* Nees
Gymnomitrion formosae (Steph.) Horik. = *Cylindrocolea recurvifolia* (Steph.) Inoue
Gymnomitrion hookeri (Lyell ex Sm.) Corda ≡ *Haplomitrium hookeri* (Lyell ex Sm.) Nees
Gymnomitrion incompletum (Gottsche) R.M.Schust. ex Váňa
**Gymnomitrion incompletum* (Gottsche) R.M.Schust. *nom. inval.* ≡ *Gymnomitrion incompletum* (Gottsche) R.M.Schust. ex Váňa
Gymnomitrion integerrimum N.Kitag. = *Cryptocoleopsis imbricata* Amakawa
**Gymnomitrion juniperum* (Sw.) Corda *nom. illeg.* = *Herbertus juniperoideus* (Sw.) Grolle
Gymnomitrion laceratum (Steph.) Horik.
Gymnomitrion laceratum (Steph.) Horik. var. *borneense* N.Kitag. = *Gymnomitrion incompletum* (Gottsche) R.M.Schust. ex Váňa
**Gymnomitrion laceratum* (Steph.) Horik. var. *squarrosum* S.W.Arnell *nom. inval.* = *Gymnomitrion laceratum* (Steph.) Horik.
Gymnomitrion lutescens (Lehm. et Lindenb.) Gottsche ≡ *Notoscyphus lutescens* (Lehm. et Lindenb.) Mitt.
Gymnomitrion marionense S.W.Arnell = *Herzogobryum atrocapillum* (Hook.f. et Taylor) Grolle
Gymnomitrion miniatum Lindenb. et Gottsche ≡ *Marsupella miniata* (Lindenb. et Gottsche) Grolle
Gymnomitrion minutulum (Hässel) Váňa
Gymnomitrion moralesae Váňa
Gymnomitrion mucronulatum (N.Kitag.) N.Kitag.
Gymnomitrion mucrophorum R.M.Schust.
**Gymnomitrion nigrum* Wade et McVean *nom. inval.* = *Gymnomitrion nigrum* (Grolle et Váňa) Váňa
Gymnomitrion nigrum (Grolle et Váňa) Váňa
Gymnomitrion noguchianum S.Hatt.
Gymnomitrion obtusilobum N.Kitag.
Gymnomitrion obtusum Lindb.
**Gymnomitrion ochraceum* Limpr. ex Müll.Frib. *nom. inval.* = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Gymnomitrion ochrophyllum (Hook.f. et Taylor) Taylor et Hook.f. ex Gottsche, Lindenb. et Nees ≡ *Acrobolbus ochrophyllus* (Hook.f. et Taylor) R.M.Schust.
Gymnomitrion orbiculatum Colenso ≡ *Solenostoma orbiculatum* (Colenso) R.M.Schust.
Gymnomitrion pacificum Grolle
Gymnomitrion papillosum N.Kitag. et S.Hatt. = *Apomarsupella verrucosa* (W.E.Nicholson) Váňa
Gymnomitrion physocaulum (Taylor) Taylor ex Gottsche, Lindenb. et Nees = *Metahygrobiella tubulata* (Hook.f. et Taylor) R.M.Schust. et J.J.Engel

Gymnomitrion reflexifolium Horik. = *Apomarsupella revoluta* (Nees) R.M.Schust.
Gymnomitrion revolutum (Nees) H.Philib. ≡ *Apomarsupella revoluta* (Nees) R.M.Schust.
Gymnomitrion scariosum (Lehm.) Nees ≡ *Gongylanthus scariosus* (Lehm.) Steph.
Gymnomitrion setaceum Grolle et Váňa
Gymnomitrion sinense Müll.Frib.
**Gymnomitrion steerei* (R.M.Schust.) R.M.Schust. *nom. inval.* = *Gymnomitrion laceratum* (Steph.) Horik.
Gymnomitrion strictum (Berggr.) R.M.Schust.
Gymnomitrion strictum (Berggr.) R.M.Schust. var. *inaequale* R.M.Schust.
Gymnomitrion stygium (Hook.f. et Taylor) Taylor et Hook.f. ex Gottsche, Lindenb. et Nees = *Andrewsianthus perigonialis* (Hook.f. et Taylor) R.M.Schust.
Gymnomitrion subintegrum (S.W.Arnell) Váňa
Gymnomitrion suecicum Gottsche ≡ *Prasanthus suecicus* (Gottsche) Lindb.
Gymnomitrion truncato-apiculatum Herzog
Gymnomitrion uncrenulatum C.Gao et G.C.Zhang = *Gymnomitrion commutatum* (Limpr.) Schiffn.
Gymnomitrion varians (Lindb.) Schiffn. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Gymnomitrion varians (Lindb.) Schiffn. var. *majus* Schiffn. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Gymnomitrion vermiculare Schiffn. ≡ *Herzogobryum vermiculare* (Schiffn.) Grolle
Gymnomitrion verrucosum W.E.Nicholson ≡ *Apomarsupella verrucosa* (W.E.Nicholson) Váňa
Herzogobryum aterrimum (Steph.) Grolle ≡ *Cephalomitrion aterrimum* (Steph.) R.M.Schust.
Herzogobryum atrocapillum (Hook.f. et Taylor) Grolle
Herzogobryum cucullatum (Herzog) Grolle = *Herzogobryum vermiculare* (Schiffn.) Grolle
Herzogobryum erosum (Carrington et Pearson) Grolle ≡ *Nothogymnomitrion erosum* (Carrington et Pearson) R.M.Schust.
Herzogobryum filarium Grolle = *Cephalomitrion aterrimum* (Steph.) R.M.Schust.
Herzogobryum filiforme R.M.Schust.
Herzogobryum molle Grolle
Herzogobryum teres (Carrington et Pearson) Grolle
Herzogobryum vermiculare (Schiffn.) Grolle
Hygrobiella japonica Steph. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Hygrobiella nevicensis (Carrington) Spruce = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Jamesoniella inflexo-limbata Herzog = *Herzogobryum teres* (Carrington et Pearson) Grolle
Jamesoniella teres (Carrington et Pearson) Steph. ≡ *Herzogobryum teres* (Carrington et Pearson) Grolle
**Jungermannia aquatica* "Schrad." ex Carringt. *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.
**Jungermannia atrata* Mitt. *nom. illeg.* = *Apomarsupella revoluta* (Nees) R.M.Schust.
Jungermannia atrocapilla (Hook.f. et Taylor) Hook.f. et Taylor ≡ *Herzogobryum atrocapillum* (Hook.f. et Taylor) Grolle
**Jungermannia brunnea* Spreng. ex Nees *nom. inval.* = *Gymnomitrion adustum* Nees
**Jungermannia byssacea* Moug. et Nestl. *nom. illeg.* = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Jungermannia concinnata Lightf. ≡ *Gymnomitrion concinnatum* (Lightf.) Corda
**Jungermannia concinnata* Lightf. β *clavuligera* Nees *nom. inval.* = *Gymnomitrion corallioides* Nees
**Jungermannia concinnata* Lightf. var. β *clavuligera* Nees ex Huebener *nom. inval.* = *Gymnomitrion corallioides* Nees
**Jungermannia concinnata* Lightf. b *minor* Schleich. *nom. inval.* = *Gymnomitrion brevissimum* (Dumort.) Warnst.
**Jungermannia concinnata* Lightf. var. *minor* Nees *nom. inval.* = *Gymnomitrion adustum* Nees
**Jungermannia concinnata* Lightf. var. β *minor* Schleich. ex Dumort. *nom. inval.* = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Jungermannia divaricata Sm. var. *latifolia* Lindb. ex Norrl. = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Jungermannia emarginata Ehrh. ≡ *Marsupella emarginata* (Ehrh.) Dumort.
Jungermannia emarginata Ehrh. var. ε *angusta* Nees ex Huebener = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Jungermannia emarginata Ehrh. β *aquatica* Lindenb. ≡ *Marsupella aquatica* (Lindenb.) Schiffn.
**Jungermannia emarginata* Ehrh. var. β *aquatica* Sw. ex Hook. *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.
Jungermannia emarginata Ehrh. var. b *crispata* Grognot = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Jungermannia emarginata* Ehrh. var. α *fusca* Moug. et Nestl. *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Jungermannia emarginata Ehrh. var. β *grandis* Nees ex Huebener = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Jungermannia emarginata Ehrh. var. γ *julacea* (Nees) Lindenb. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Jungermannia emarginata Ehrh. β *julacea* Nees = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Jungermannia emarginata* Ehrh. d *minima* Schleich. *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp.

emarginata

**Jungermannia emarginata* Ehrh. c *nigra* Schleich. ex Lindenb. *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

**Jungermannia emarginata* Ehrh. c *nigra* Schleich. *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Jungermannia emarginata Ehrh. var. α *patens* Nees = *Marsupella aquatica* (Lindenb.) Schiffn.

**Jungermannia emarginata* Ehrh. var. γ *rivularis* Sw. ex Huebener *nom. illeg.* = *Marsupella aquatica* (Lindenb.) Schiffn.

**Jungermannia emarginata* Ehrh. var. γ *rivularis* Sw. ex Steud. *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.

Jungermannia emarginata Ehrh. var. *saccata* (Nees) Moug., Nestl. et Schimp. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

Jungermannia emarginata Ehrh. var. δ *turgida* Huebener = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

**Jungermannia emarginata* Ehrh. var. β *viridis* Moug. et Nestl. *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Jungermannia funckii F.Weber et D.Mohr ≡ *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Jungermannia funckii F.Weber et D.Mohr var. γ *gracilescens* Huebener = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Jungermannia funckii F.Weber et D.Mohr var. β *rupestris* Huebener = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

**Jungermannia fusca* Nees ex Huebener *nom. illeg.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

**Jungermannia glacialis* Schleich. *nom. inval.* = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Jungermannia gymnomitrioides Nees = *Gymnomitrion concinnatum* (Lightf.) Corda

Jungermannia incompleta Gottsche ≡ *Gymnomitrion incompletum* (Gottsche) R.M.Schust. ex Váňa

Jungermannia macrorhiza Dicks. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Jungermannia nevicensis Carrington = *Marsupella boeckii* (Austin) Lindb. ex Kaal.

Jungermannia pulvinata Raddi = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

**Jungermannia rivularis* Sw. ex F.Weber et D.Mohr *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.

**Jungermannia rivularis* Sw. ex Nees *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.

Jungermannia rubida Mitt. ≡ *Apomarsupella rubida* (Mitt.) R.M.Schust.

Jungermannia sphacelata Giesecke ex Lindenb. ≡ *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

Jungermannia teres Carrington et Pearson ≡ *Herzogobryum teres* (Carrington et Pearson) Grolle

Jungermannia ustulata Huebener = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

**Jungermannia varia* F.Weber et D.Mohr ex Huebener *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Lophonardia caespitosa R.M.Schust. = *Hypolophozia laxifolia* (Mont.) Váňa et J.J.Engel

Lophozia canariensis Bryhn = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Lophozia ubayensis Steph. = *Gymnomitrion corallioides* Nees

Marsupella adusta (Nees) Spruce ≡ *Gymnomitrion adustum* Nees

Marsupella aemula (Limpr.) Lindb. ex Kaal. = *Marsupella condensata* (Ångstr. ex C.Hartm.) Lindb. ex Kaal.

**Marsupella aemula* Lindb. *nom. inval.* = *Marsupella condensata* (Ångstr. ex C.Hartm.) Lindb. ex Kaal.

Marsupella aequiloba Steph. ex Bonner = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

**Marsupella affinis* Kaal. ex Jørg. *nom. inval.* = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

Marsupella africana Steph. ex Bonner ≡ *Apomarsupella africana* (Steph. ex Bonner) R.M.Schust.

Marsupella alata S.Hatt. et N.Kitag. ex N.Kitag.

Marsupella alpina (Gottsche ex Husn.) Bernet ≡ *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.

**Marsupella alpina* (Gottsche) Gottsche ex Trevis. *nom. inval.* = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.

Marsupella alpina (Gottsche ex Husn.) Bernet α *fusca* Bernet = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.

Marsupella alpina (Gottsche ex Husn.) Bernet β* *heterophylla* (Bernet) Bernet = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.

Marsupella alpina (Gottsche ex Husn.) Bernet var. *heterophylla* (Bernet) Boulay = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.

Marsupella alpina (Gottsche ex Husn.) Bernet var. b *laxior* (Carrington et Pearson) Waddell = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.

Marsupella alpina (Gottsche ex Husn.) Bernet γ *payotii* Bernet = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.

Marsupella alpina (Gottsche ex Husn.) Bernet β *procumbens* Bernet = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.

**Marsupella andicola* R.M.Schust. *nom. inval.* = *Marsupella miniata* (Lindenb. et Gottsche) Grolle

Marsupella andina J.B.Jack et Steph. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Marsupella andreaeoides (Lindb.) Müll.Frib.

Marsupella apertifolia Steph. ≡ *Marsupella emarginata* (Ehrh.) Dumort. subsp. *tubulosa var. apertifolia* (Steph.) N.Kitag.

Marsupella apiculata Schiffn.
Marsupella apiculata Schiffn. var. *gracilescens* Schiffn. = *Marsupella apiculata* Schiffn.
Marsupella aquatica (Lindenb.) Schiffn.
Marsupella aquatica (Lindenb.) Schiffn. var. *gracilis* C.E.O.Jensen = *Marsupella aquatica* (Lindenb.) Schiffn.
**Marsupella aquatica* (Lindenb.) Schiffn. f. *nigra* Arnell et C.E.O.Jensen *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.
**Marsupella aquatica* (Lindenb.) Schiffn. f. *obscura* Arnell et C.E.O.Jensen *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.
**Marsupella aquatica* (Lindenb.) Schiffn. var. *pearsonii* (Macvicar) E.W.Jones *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella aquatica (Lindenb.) Schiffn. f. *pearsonii* (Macvicar) Schljakov = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Marsupella aquatica* (Lindenb.) Schiffn. f. *rubescens* Arnell et C.E.O.Jensen *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.
**Marsupella aquatica* (Lindenb.) Schiffn. var. *submersa* Arnell ex Schiffn. *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.
**Marsupella aquatica* (Lindenb.) Schiffn. f. *viridis* Arnell et C.E.O.Jensen *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.
Marsupella arctica (Berggr.) Bryhn et Kaal.
Marsupella aurita (Lehm.) Sim ≡ *Anastrophyllum auritum* (Lehm.) Steph.
**Marsupella austro-americana* Váňa ex Gradst. et Hekking *nom. inval.* = *Marsupella miniata* (Lindenb. et Gottsche) Grolle
Marsupella austrogeorgica Hässel = *Herzogobryum atrocapillum* (Hook.f. et Taylor) Grolle
Marsupella badensis Schiffn. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
**Marsupella boeckii* Lindb. *nom. inval.* = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Marsupella boeckii (Austin) Lindb. ex Kaal.
Marsupella boeckii (Austin) Lindb. ex Kaal. var. *incrassata* Arnell et C.E.O.Jensen = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Marsupella boeckii (Austin) Lindb. ex Kaal. var. *intricata* (Lindb.) Arnell et C.E.O.Jensen = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Marsupella boeckii (Austin) Lindb. ex Kaal. var. *latifolia* (Lindb. ex Norrl.) Kaal. = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Marsupella boeckii (Austin) Lindb. ex Kaal. var. *nevicensis* (Carrington) Kaal. ex Jørg. = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Marsupella boeckii (Austin) Lindb. ex Kaal. var. *ruwenzorensis* S.W.Arnell = *Nardia arnelliana* Grolle
Marsupella boeckii (Austin) Lindb. ex Kaal. var. *stableri* (Spruce) R.M.Schust. ≡ *Marsupella stableri* Spruce
Marsupella bolanderi (Austin) Underw.
Marsupella brevissima (Dumort.) Grolle ≡ *Gymnomitrion brevissimum* (Dumort.) Warnst.
**Marsupella cambrica* Pearson ex Schiffn. *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella campylata (Grolle) R.M.Schust. ≡ *Poeltia campylata* Grolle
Marsupella capensis S.W.Arnell = *Gymnomitrion bolivianum* (Steph.) Váňa
Marsupella capillaris (Limpr.) Bernet = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Marsupella chilensis Steph. ex Bonner = *Apomarsupella africana* (Steph. ex Bonner) R.M.Schust.
Marsupella cochlearis (Lindb.) Spruce = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Marsupella commutata (Limpr.) Bernet ≡ *Gymnomitrion commutatum* (Limpr.) Schiffn.
**Marsupella commutata* (Limpr.) Bernet var. *microfolia* G.C.Zhang *nom. inval.* = *Gymnomitrion commutatum* (Limpr.) Schiffn.
Marsupella concinnata (Lightf.) Spruce ≡ *Gymnomitrion concinnatum* (Lightf.) Corda
Marsupella condensata (Ångstr. ex C.Hartm.) Lindb. ex Kaal.
Marsupella condensata (Ångstr. ex C.Hartm.) Lindb. ex Kaal. f. *pygmaea* Kaal. ex Jørg. = *Marsupella condensata* (Ångstr. ex C.Hartm.) Lindb. ex Kaal.
Marsupella conferta (Limpr.) Spruce = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Marsupella crassifolia (Carrington) Spruce = *Gymnomitrion brevissimum* (Dumort.) Warnst.
**Marsupella crenulata* C.Massal. et Steph. *nom. illeg.* = *Anastrophyllum auritum* (Lehm.) Steph.
Marsupella crenulata (Gottsche ex Carrington) Spruce ≡ *Gymnomitrion crenulatum* Gottsche ex Carrington
Marsupella crystallocaulon Grolle ≡ *Apomarsupella crystallocaulon* (Grolle) Váňa
Marsupella cuspidata Steph. = *Gymnomitrion bolivianum* (Steph.) Váňa
Marsupella decipiens (C.Massal. et Carestia) Spruce = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Marsupella delavayi Steph. = *Apomarsupella revoluta* (Nees) R.M.Schust.

Marsupella densifolia (Nees) Trevis. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella densifolia (Nees) Dumort. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella disticha Steph.
Marsupella disticha Steph. var. *pseudofunckii* (S.Hatt.) S.Hatt. ≡ *Marsupella pseudofunckii* S.Hatt.
Marsupella emarginata (Ehrh.) Dumort.
**Marsupella emarginata* Dumort. *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort.
Marsupella emarginata (Ehrh.) Dumort. subsp. *aquatica* (Lindenb.) Meyl. ≡ *Marsupella aquatica* (Lindenb.) Schiffn.
Marsupella emarginata (Ehrh.) Dumort. var. β *aquatica* (Lindenb.) Dumort. ≡ *Marsupella aquatica* (Lindenb.) Schiffn.
Marsupella emarginata (Ehrh.) Dumort. α *aquatica* (Lindenb.) Bernet ≡ *Marsupella aquatica* (Lindenb.) Schiffn.
Marsupella emarginata (Ehrh.) Dumort. var. *arctica* (Berggr.) Frye et L.Clark ≡ *Marsupella arctica* (Berggr.) Bryhn et Kaal.
Marsupella emarginata (Ehrh.) Dumort. var. *attenuata* Kaal. ex Jørg. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Spruce var. *densifolia* (Nees) Müll.Frib. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Spruce f. *densifolia* (Nees) Jørg. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Dumort. var. *ericetorum* (Gottsche, Lindenb. et Nees) Zodda = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Dumort. f. *filamentosa* (J.B.Jack) Dalla Torre et Sarnth. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Dumort. f. *gracilescens* Kaal. ex Jørg. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Dumort. γ *gracilis* Bernet = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Dumort. δ *humilis* Bernet = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Dumort. var. γ *julacea* (Nees) Dumort. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Marsupella emarginata* (Ehrh.) Dumort. var. *latiloba* R.M.Schust. *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Dumort. var. *ligurica* (Gottsche) Schiffn. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Dumort. f. *ligurica* (Gottsche) Jørg. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Marsupella emarginata* (Ehrh.) Dumort. f. *minor* Kaal. ex Jørg. *nom. illeg.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Marsupella emarginata* (Ehrh.) Dumort. var. *minor* C.Massal. ex Schiffn. *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Marsupella emarginata* (Ehrh.) Dumort. var. c *minor* Carrington ex Waddell *nom. illeg.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Dumort. f. *mutabilis* Jørg. = *Marsupella aquatica* (Lindenb.) Schiffn.
Marsupella emarginata (Ehrh.) Dumort. f. *nigra* C.E.O.Jensen = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Marsupella emarginata* (Ehrh.) Dumort. var. *obtusiloba* Schiffn. *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Dumort. var. *pearsonii* (Macvicar) Jørg. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Dumort. f. *pearsonii* (Macvicar) S.W.Arnell = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Dumort. α* *procera* Gottsche ex Bernet = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Dumort. var. *robusta* (De Not.) Bom. et Broth. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella emarginata (Ehrh.) Dumort. var. *saccata* (Nees) Pearson = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella emarginata (Ehrh.) Dumort. subsp. *tubulosa* (Steph.) N.Kitag.
Marsupella emarginata (Ehrh.) Dumort. subsp. *tubulosa var. apertifolia* (Steph.) N.Kitag.
Marsupella emarginata (Ehrh.) Dumort. subsp. *tubulosa var. patens* N.Kitag.
Marsupella emarginata (Ehrh.) Dumort. subsp. *tubulosa var. tubulosa* (Steph.) N.Kitag.
Marsupella emarginata (Ehrh.) Dumort. f. *umbraticola* Kaal. ex Jørg. = *Marsupella emarginata* (Ehrh.) Dumort. subsp.

emarginata

**Marsupella emarginata* (Ehrh.) Dumort. f. *umbrosa* Schiffn. *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Marsupella erythrorhiza (Limpr.) Schiffn. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

Marsupella erythrorhiza (Limpr.) Schiffn. f. *brevicaulis* Schiffn. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

Marsupella erythrorhiza (Limpr.) Schiffn. var. *brevicaulis* (Schiffn.) Schiffn. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

Marsupella erythrorhiza (Limpr.) Schiffn. f. *gracilescens* Schiffn. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

Marsupella erythrorhiza (Limpr.) Schiffn. f. *nana* Schiffn. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

Marsupella exigua Steph. = *Anastrophyllum tubulosum* (Nees) Grolle

**Marsupella fauriana* Steph. ex N.Kitag. *nom. inval.* = *Marsupella yakushimensis* (Horik.) S.Hatt.

Marsupella fengchengensis C.Gao = *Cylindrocolea tagawae* (N.Kitag.) R.M.Schust.

Marsupella filiformis (Lindb.) Lindb. ex Kaal. = *Marsupella boeckii* (Austin) Lindb. ex Kaal.

**Marsupella filiformis* (Lindb.) Lindb. *nom. inval.* = *Marsupella boeckii* (Austin) Lindb. ex Kaal.

Marsupella fosteri Steph. ex Bonner = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Marsupella funckii (F.Weber et D.Mohr) Dumort.

Marsupella funckii (F.Weber et D.Mohr) Dumort. var. *badensis* (Schiffn.) Fam. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Marsupella funckii (F.Weber et D.Mohr) Dumort. var. *byssacea* (Moug. et Nestl.) Dalla Torre et Sarnth. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Marsupella funckii (F.Weber et D.Mohr) Dumort. var. c *diffusa* (Carrington) Waddell = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Marsupella funckii (F.Weber et D.Mohr) Dumort. var. *gracilis* Bernet = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Marsupella funckii (F.Weber et D.Mohr) Dumort. f. *major* (Nees) Jørg. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Marsupella funckii (F.Weber et D.Mohr) Dumort. var. α *major* (Nees) Boulay = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Marsupella funckii (F.Weber et D.Mohr) Dumort. var. β *minor* (Nees) Dumort. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Marsupella funckii (F.Weber et D.Mohr) Dumort. var. *ramosa* (Müll.Frib.) Husn. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Marsupella funckii (F.Weber et D.Mohr) Dumort. var. b *robustior* (Carrington) Waddell = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Marsupella gracilis (C.Massal. et Carestia) Pearson = *Marsupella sprucei* (Limpr.) Bernet

Marsupella groenlandica C.E.O.Jensen = *Marsupella arctica* (Berggr.) Bryhn et Kaal.

**Marsupella gypsophylla* Dumort. *nom. inval.* = *Sphenolobus minutus* (Schreb. ex Crantz) Berggr.

Marsupella hedbergii S.W.Arnell = *Apomarsupella africana* (Steph. ex Bonner) R.M.Schust.

**Marsupella hungarica* Boros et Vajda *nom. inval.* = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Marsupella hungarica Boros et Vajda ex Vajda = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Marsupella integra N.Kitag. = *Gymnomitrion subintegrum* (S.W.Arnell) Váňa

Marsupella integrifolia Steph. ex Bonner = *Gymnomitrion noguchianum* S.Hatt.

Marsupella intricata (Lindb.) Steph. = *Marsupella boeckii* (Austin) Lindb. ex Kaal.

Marsupella involuta Váňa = *Gymnomitrion truncato-apiculatum* Herzog

Marsupella jackii (Limpr.) Loeske = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

Marsupella japonica Steph. ex Bonner = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *tubulosa* (Steph.) N.Kitag.

Marsupella joergensenii Schiffn. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

Marsupella joergensenii Schiffn. f. *densiretis* Kaal. ex Jørg. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

**Marsupella joergensenii* Schiffn. f. *gracilior* Kaal. ex Jørg. *nom. inval.* = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

**Marsupella joergensenii* Schiffn. f. *gracilis* Bryhn ex Jørg. *nom. inval.* = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

Marsupella joergensenii Schiffn. f. *nivalis* Jørg. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

Marsupella kerguelena (Schiffn.) Steph. = *Acrobolbus ochrophyllus* (Hook.f. et Taylor) R.M.Schust.

Marsupella lacerata (Steph.) Váňa = *Gymnomitrion bolivianum* (Steph.) Váňa

Marsupella lapponica Limpr. ex Loitl. = *Marsupella boeckii* (Austin) Lindb. ex Kaal.

**Marsupella latifolia* Lindb. *nom. inval.* = *Marsupella boeckii* (Austin) Lindb. ex Kaal.

Marsupella lorentziana Steph. = *Marsupella miniata* (Lindenb. et Gottsche) Grolle
Marsupella media (Gottsche) Schiffn. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella mexicana (Lindenb. et Gottsche) Steph. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella microphylla R.M.Schust.
Marsupella mikawana Steph. ex Bonner = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *tubulosa* (Steph.) N.Kitag.
Marsupella miniata (Lindenb. et Gottsche) Grolle
Marsupella minutissima N.Kitag.
Marsupella minutula Hässel ≡ *Gymnomitrion minutulum* (Hässel) Váňa
Marsupella moralesae (Váňa) Váňa ≡ *Gymnomitrion moralesae* Váňa
Marsupella muelleri (Nees) Dumort. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Marsupella neesii (Nees ex Sande Lac.) Sande Lac. ex Schiffn.
Marsupella neglecta (Limpr.) Lindb. = *Marsupella sprucei* (Limpr.) Bernet
Marsupella nevicensis (Carrington) Pearson = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Marsupella nevicensis (Carrington) Pearson f. *irrigua* (Limpr.) Müll.Frib. = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Marsupella nigra Grolle et Váňa ≡ *Gymnomitrion nigrum* (Grolle et Váňa) Váňa
Marsupella nitida N.Kitag. = *Apomarsupella rubida* (Mitt.) R.M.Schust.
Marsupella obcordata (Berggr.) Steph. ≡ *Scapania obcordata* (Berggr.) S.W.Arnell
Marsupella olivacea Spruce = *Gymnomitrion adustum* Nees
Marsupella paroica R.M.Schust.
Marsupella parvitexta Steph. = *Gymnomitrion commutatum* (Limpr.) Schiffn.
Marsupella pearsonii Macvicar = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella pearsonii Macvicar var. *revoluta* Schiffn. = *Marsupella aquatica* (Lindenb.) Schiffn.
Marsupella polyanthos (L.) Dumort. ≡ *Chiloscyphus polyanthos* (L.) Corda
Marsupella profunda Lindb.
Marsupella pseudofunckii S.Hatt.
**Marsupella pseudofunckii* S.Hatt. *nom. inval.* = *Marsupella pseudofunckii* S.Hatt.
Marsupella pulvinata (Raddi) Trevis. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella pusilla Steph. = *Anastrophyllum auritum* (Lehm.) Steph.
Marsupella pygmaea (Limpr.) Steph. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Marsupella ramosa Müll.Frib. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
**Marsupella repens* Lindb. ex Müll.Frib. *nom. inval.* = *Marsupella sprucei* (Limpr.) Bernet
Marsupella revoluta (Nees) Trevis. ≡ *Apomarsupella revoluta* (Nees) R.M.Schust.
Marsupella rikuchuna Steph. ex Bonner = *Gymnocolea inflata* (Huds.) Dumort.
Marsupella robusta (De Not.) A.Evans = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella robusta (De Not.) A.Evans f. *pearsonii* (Macvicar) Schljakov = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella rubida (Mitt.) Grolle ≡ *Apomarsupella rubida* (Mitt.) R.M.Schust.
Marsupella shimizuana* S.Hatt. *nom. inval.
Marsupella silvrettae (Gottsche et Rabenh.) Gottsche ex Dumort. = *Nardia geoscyphus* (De Not.) Lindb.
Marsupella sparsifolia (Lindb.) Dumort.
**Marsupella sparsifolia* (Lindb.) Dumort. var. *africana* S.W.Arnell *nom. inval.* = *Marsupella sparsifolia* (Lindb.) Dumort.
Marsupella sparsifolia* (Lindb.) Dumort. subsp. *childii* R.M.Schust. *nom. inval.
Marsupella sparsifolia (Lindb.) Dumort. var. *norica* (Limpr.) Müll.Frib. = *Marsupella sparsifolia* (Lindb.) Dumort. subsp. *sparsifolia*
Marsupella sphacelata (Giesecke ex Lindenb.) Dumort.
Marsupella sphacelata (Giesecke ex Lindenb.) Dumort. var. *arduennensis* Boulay = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella sphacelata (Giesecke ex Lindenb.) Dumort. f. *bifida* R.M.Schust. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
**Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort. f. *densiretis* Kaal. ex S.W.Arnell *nom. inval.* = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella sphacelata (Giesecke ex Lindenb.) Dumort. var. *erythrorhiza* (Limpr.) Loitl. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
**Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort. var. β *eusphacelata* Schiffn. *nom. illeg.* = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
**Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort. f. *inaequalis* H.Buch *nom. inval.* = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
**Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort. var. *inundata* Müll.Frib. *nom. inval.* = *Marsupella sphacelata*

(Giesecke ex Lindenb.) Dumort.
Marsupella sphacelata (Giesecke ex Lindenb.) Dumort. f. *joergensenii* (Schiffn.) R.M.Schust. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella sphacelata (Giesecke ex Lindenb.) Dumort. var. γ *joergensenii* (Schiffn.) Schiffn. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella sphacelata (Giesecke ex Lindenb.) Dumort. var. *media* (Gottsche) Trevis. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella sphacelata (Giesecke ex Lindenb.) Dumort. f. *media* (Gottsche) R.M.Schust. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella sphacelata (Giesecke ex Lindenb.) Dumort. var. α *minor* (Bernet) Boulay = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella sphacelata (Giesecke ex Lindenb.) Dumort. α *minor* Bernet = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella sphacelata (Giesecke ex Lindenb.) Dumort. var. *pachyderma* S.Hatt. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *tubulosa var. apertifolia* (Steph.) N.Kitag.
**Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort. β *robustior* Bernet *nom. illeg.* = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella sphacelata (Giesecke ex Lindenb.) Dumort. var. *rosea* Kaal. ex Jørg. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella sphacelata (Giesecke ex Lindenb.) Dumort. var. *saccata* (Nees) Jørg. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella sphacelata (Giesecke ex Lindenb.) Dumort. var. β *sullivantii* (De Not.) C.Massal. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella spiniloba R.M.Schust. et Damsh.
Marsupella sprucei (Limpr.) Bernet
Marsupella sprucei (Limpr.) Bernet var. *neglecta* (Limpr.) Damsh. = *Marsupella sprucei* (Limpr.) Bernet
Marsupella sprucei (Limpr.) Bernet var. *ustulata* (Spruce) Damsh. = *Marsupella sprucei* (Limpr.) Bernet
**Marsupella sprucei* (Limpr.) Bernet f. *ustulata* (Spruce) Schljakov *nom. inval.* = *Marsupella sprucei* (Limpr.) Bernet
**Marsupella sprucei* (Limpr.) Bernet f. *viridis* Limpr. ex Schiffn. *nom. inval.* = *Marsupella sprucei* (Limpr.) Bernet
Marsupella stableri Spruce
Marsupella stoloniformis N.Kitag.
Marsupella stoloniformis N.Kitag. subsp. *vermiformis* R.M.Schust.
Marsupella styriaca (Limpr.) Kaal. = *Marsupella sparsifolia* (Lindb.) Dumort. subsp. *sparsifolia*
Marsupella subhyalina R.M.Schust. = *Gymnomitrion bolivianum* (Steph.) Váňa
Marsupella subintegra S.W.Arnell ≡ *Gymnomitrion subintegrum* (S.W.Arnell) Váňa
**Marsupella subquadrata* Steph. *nom. inval.* = *Apomarsupella africana* (Steph. ex Bonner) R.M.Schust.
Marsupella sullivantii (De Not.) A.Evans = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella sullivantii (De Not.) A.Evans f. *brevicaulis* Schiffn. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella sullivantii (De Not.) A.Evans f. *gracilescens* Schiffn. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Marsupella sumatrana Schiffn. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella sumatrana Schiffn. var. *lurida* Schiffn. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella trollii Herzog = *Gymnomitrion bolivianum* (Steph.) Váňa
Marsupella truncato-apiculata (Herzog) Váňa ≡ *Gymnomitrion truncato-apiculatum* Herzog
Marsupella tubulosa Steph. ≡ *Marsupella emarginata* (Ehrh.) Dumort. subsp. *tubulosa* (Steph.) N.Kitag.
Marsupella tubulosa Steph. var. *apertifolia* (Steph.) S.Hatt. ≡ *Marsupella emarginata* (Ehrh.) Dumort. subsp. *tubulosa var. apertifolia* (Steph.) N.Kitag.
Marsupella tubulosa Steph. f. *intermedia* S.Hatt. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *tubulosa* (Steph.) N.Kitag.
Marsupella tubulosa Steph. f. *rubidula* S.Hatt. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *tubulosa* (Steph.) N.Kitag.
**Marsupella ustulata* (Huebener) Spruce ex Pearson *nom. illeg.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Marsupella ustulata Spruce = *Marsupella sprucei* (Limpr.) Bernet
**Marsupella ustulata* Spruce f. *neglecta* (Limpr.) R.M.Schust. *nom. inval.* = *Marsupella sprucei* (Limpr.) Bernet
Marsupella ustulata Spruce var. *neglecta* (Limpr.) Müll.Frib. = *Marsupella sprucei* (Limpr.) Bernet
**Marsupella ustulata* (Huebener) Spruce ex Pearson f. *sprucei* (Limpr.) Schljakov *nom. illeg.* ≡ *Marsupella sprucei* (Limpr.) Bernet

**Marsupella ustulata* (Huebener) Spruce ex Pearson subsp. *sprucei* (Limpr.) Meyl. *nom. illeg.* ≡ *Marsupella sprucei* (Limpr.) Bernet

**Marsupella ustulata* (Huebener) Spruce ex Pearson var. *sprucei* (Limpr.) R.M.Schust. *nom. illeg.* ≡ *Marsupella sprucei* (Limpr.) Bernet

**Marsupella ustulata* Spruce var. *squarrosula* Lindb. ex J.Perss. *nom. inval.* = *Marsupella sprucei* (Limpr.) Bernet

Marsupella varians (Lindb.) Müll.Frib. = *Gymnomitrion brevissimum* (Dumort.) Warnst.

Marsupella varians (Lindb.) Müll.Frib. var. *crassifolia* (Carrington) Jørg. ex S.W.Arnell = *Gymnomitrion brevissimum* (Dumort.) Warnst.

Marsupella verrucosa (W.E.Nicholson) Grolle ≡ *Apomarsupella verrucosa* (W.E.Nicholson) Váňa

Marsupella vulcanica Schiffn. = *Marsupella neesii* (Nees ex Sande Lac.) Sande Lac. ex Schiffn.

Marsupella xenophylla R.M.Schust. ≡ *Nanomarsupella xenophylla* (R.M.Schust.) R.M.Schust.

Marsupella yakushimensis (Horik.) S.Hatt.

Marsupia emarginata (Ehrh.) Dumort. ≡ *Marsupella emarginata* (Ehrh.) Dumort.

Marsupia emarginata (Ehrh.) Dumort. var. β *aquatica* (Lindenb.) Dumort. ≡ *Marsupella aquatica* (Lindenb.) Schiffn.

Marsupia emarginata (Ehrh.) Dumort. var. γ *julacea* (Nees) Dumort. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Marsupia funckii (F.Weber et D.Mohr) Dumort. ≡ *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Marsupia sphacelata (Giesecke ex Lindenb.) Dumort. ≡ *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.

Nanomarsupella xenophylla (R.M.Schust.) R.M.Schust.

Nardia adusta (Nees) Carrington ≡ *Gymnomitrion adustum* Nees

Nardia aemula (Limpr.) C.Massal. et Carestia = *Marsupella condensata* (Ångstr. ex C.Hartm.) Lindb. ex Kaal.

Nardia alpina (Gottsche ex Husn.) Trevis. ≡ *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.

**Nardia alpina* (Gottsche) Gottsche ex Carrington *nom. inval.* = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.

Nardia alpina (Gottsche ex Husn.) Trevis. var. *laxior* Carrington et Pearson = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.

Nardia boeckii (Austin) Lindb. ≡ *Marsupella boeckii* (Austin) Lindb. ex Kaal.

Nardia bolanderi (Austin) Underw. ≡ *Marsupella bolanderi* (Austin) Underw.

Nardia brevissima (Dumort.) Lindb. ≡ *Gymnomitrion brevissimum* (Dumort.) Warnst.

Nardia capillaris (Limpr.) C.Massal. et Carestia = *Marsupella boeckii* (Austin) Lindb. ex Kaal.

Nardia cochlearis Lindb. = *Gymnomitrion brevissimum* (Dumort.) Warnst.

Nardia commutata (Limpr.) C.Massal. et Carestia ≡ *Gymnomitrion commutatum* (Limpr.) Schiffn.

Nardia condensata (Ångstr. ex C.Hartm.) Lindb. ≡ *Marsupella condensata* (Ångstr. ex C.Hartm.) Lindb. ex Kaal.

Nardia densifolia (Nees) Trevis. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Nardia emarginata (Ehrh.) Gray ≡ *Marsupella emarginata* (Ehrh.) Dumort.

Nardia emarginata (Ehrh.) Gray f. * *acutiuscula* Carrington = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Nardia emarginata (Ehrh.) Gray β *aquatica* (Lindenb.) Carrington ≡ *Marsupella aquatica* (Lindenb.) Schiffn.

Nardia emarginata (Ehrh.) Gray β *elongata* C.Massal. et Carestia = *Marsupella aquatica* (Lindenb.) Schiffn.

Nardia emarginata (Ehrh.) Gray ε *ericetorum* (Gottsche, Lindenb. et Nees) C.Massal. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Nardia emarginata (Ehrh.) Gray xx *intermedia* C.Massal. et Carestia = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Nardia emarginata (Ehrh.) Gray x *ligurica* (Gottsche) C.Massal. et Carestia = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Nardia emarginata (Ehrh.) Gray α *major* Carrington = *Marsupella aquatica* (Lindenb.) Schiffn.

**Nardia emarginata* (Ehrh.) Gray β *minor* (C.Massal. et Carestia) C.Massal. *nom. illeg.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

**Nardia emarginata* (Ehrh.) Gray γ *minor* Carrington *nom. illeg.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

**Nardia emarginata* (Ehrh.) Gray f. * *minor* C.Massal. et Carestia *nom. illeg.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Nardia emarginata (Ehrh.) Gray f. ** *obtusa* Carrington = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Nardia emarginata (Ehrh.) Gray δ *picea* Carrington = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Nardia emarginata (Ehrh.) Gray f. *propagulifera* Corb. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*

Nardia filiformis Lindb. = *Marsupella boeckii* (Austin) Lindb. ex Kaal.

Nardia funckii (F.Weber et D.Mohr) Carrington ex Lindb. ≡ *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Nardia funckii (F.Weber et D.Mohr) Carrington ex Lindb. β *decipiens* C.Massal. et Carestia = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Nardia funckii (F.Weber et D.Mohr) Carrington ex Lindb. β* *diffusa* Carrington = *Marsupella funckii* (F.Weber et

D.Mohr) Dumort.
Nardia funckii (F.Weber et D.Mohr) Carrington ex Lindb. β *minor* (Nees) C.Massal. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Nardia funckii (F.Weber et D.Mohr) Carrington ex Lindb. β *robustior* Carrington = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Nardia gracilis C.Massal. et Carestia = *Marsupella sprucei* (Limpr.) Bernet
Nardia intricata Lindb. = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
**Nardia latifolia* Lindb. *nom. inval.* = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Nardia mexicana (Lindenb. et Gottsche) Trevis. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Nardia muelleri (Nees) C.Massal. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Nardia muelleri (Nees) C.Massal. var. *ligurica* C.Massal. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Nardia muelleri* (Nees) C.Massal. var. b *ligurica-viride* Carrington *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Nardia muelleri (Nees) C.Massal. var. *ligurica-viride* Carrington et Pearson ex Cooke = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Nardia nevicensis (Carrington) C.Massal. et Carestia = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
**Nardia pectinata* Carrington ex Müll.Frib. *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Nardia picea (Carrington) Carrington = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Nardia pulvinata (Raddi) Trevis. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Nardia revoluta (Nees) Lindb. ≡ *Apomarsupella revoluta* (Nees) R.M.Schust.
Nardia robusta (De Not.) Trevis. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Nardia robusta* (De Not.) Lindb. ex Carrington *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Nardia sparsifolia (Lindb.) Lindb. ≡ *Marsupella sparsifolia* (Lindb.) Dumort.
**Nardia sparsifolia* (Lindb.) Lindb. β *adusta* (Nees) Lindb. ex Carrington *nom. inval.* ≡ *Gymnomitrion adustum* Nees
Nardia sparsifolia (Lindb.) Lindb. var. β *minor* Schleich. ex Lindb. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Nardia sphacelata (Giesecke ex Lindenb.) Carrington ≡ *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Nardia sphacelata (Giesecke ex Lindenb.) Carrington β *media* (Gottsche) C.Massal. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Nardia sprucei (Limpr.) C.Massal. et Carestia ≡ *Marsupella sprucei* (Limpr.) Bernet
**Nardia stableri* (Spruce) Spruce *nom. inval.* ≡ *Marsupella stableri* Spruce
Nardia sullivantii (De Not.) Trevis. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Nardia ustulata (Spruce) Lindb. = *Marsupella sprucei* (Limpr.) Bernet
Nardia varians Lindb. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Nardiocalyx apiculata (Schiffn.) Jørg. ≡ *Marsupella apiculata* Schiffn.
Nothogymnomitrion erosum (Carrington et Pearson) R.M.Schust.
Notoscyphus suecicus (Gottsche) Steph. ≡ *Prasanthus suecicus* (Gottsche) Lindb.
Paramomitrion paradoxum R.M.Schust.
Poeltia campylata Grolle
Poeltia stoloniformis (N.Kitag.) R.M.Schust. ≡ *Marsupella stoloniformis* N.Kitag.
Prasanthus jamalicus Potemkin
Prasanthus paroicus (Schiffn.) Kamim. = *Notoscyphus lutescens* (Lehm. et Lindenb.) Mitt.
Prasanthus suecicus (Gottsche) Lindb.
Sarcocyphos adustus (Nees) Spruce ≡ *Gymnomitrion adustum* Nees
Sarcocyphos aemulus Limpr. = *Marsupella condensata* (Ångstr. ex C.Hartm.) Lindb. ex Kaal.
Sarcocyphos alpinus Gottsche ex Husn. ≡ *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
**Sarcocyphos alpinus* Gottsche *nom. inval.* = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
**Sarcocyphos alpinus* Lindb. *nom. inval.* = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
Sarcocyphos alpinus Gottsche ex Husn. var. *heterophyllus* Bernet = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
Sarcocyphos alpinus Gottsche ex Husn. f. *laxior* Gottsche et Rabenh. = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
**Sarcocyphos anomalus* J.B.Jack ex Gottsche et Rabenh. *nom. inval.* = *Nardia geoscyphus* (De Not.) Lindb.
Sarcocyphos aquaticus (Lindenb.) Breidl. ≡ *Marsupella aquatica* (Lindenb.) Schiffn.
Sarcocyphos auritus (Lehm.) Nees ≡ *Anastrophyllum auritum* (Lehm.) Steph.
Sarcocyphos badensis Schiffn. ex Müll.Frib. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Sarcocyphos boeckii Austin ≡ *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Sarcocyphos bolanderi Austin ≡ *Marsupella bolanderi* (Austin) Underw.
Sarcocyphos capillaris Limpr. = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Sarcocyphos capillaris Limpr. var. β *irriguus* Limpr. = *Marsupella boeckii* (Austin) Lindb. ex Kaal.

Sarcocyphos commutatus Limpr. ≡ *Gymnomitrion commutatum* (Limpr.) Schiffn.
Sarcocyphos confertus Limpr. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
**Sarcocyphos decolorans* (Limpr.) Husn. *nom. inval.* ≡ *Isopaches decolorans* (Limpr.) H.Buch
**Sarcocyphos delavayi* Steph. *nom. inval.* = *Apomarsupella revoluta* (Nees) R.M.Schust.
Sarcocyphos densifolius Nees = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Sarcocyphos densifolius Nees β *dichotomus* Nees = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Sarcocyphos densifolius Nees γ *fascicularis* Nees = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Sarcocyphos ehrhardtii* Corda *nom. illeg.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Sarcocyphos ehrhardtii* Corda f. *acutus* Carrington *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Sarcocyphos ehrhardtii Corda β *aquaticus* (Lindenb.) Nees ≡ *Marsupella aquatica* (Lindenb.) Schiffn.
Sarcocyphos ehrhardtii Corda ε *ericetorum* Gottsche, Lindenb. et Nees = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Sarcocyphos ehrhardtii Corda c *erythrorhizus* Limpr. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Sarcocyphos ehrhardtii Corda f. *filamentosus* J.B.Jack = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Sarcocyphos ehrhardtii* Corda f. α *fusco-purpureus* Nees ex Limpr. *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.
Sarcocyphos ehrhardtii Corda f. *humilis* Nees = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Sarcocyphos ehrhardtii Corda γ *julaceus* (Nees) Nees = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Sarcocyphos ehrhardtii* Corda * *julaceus* (Nees) Ångstr. *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Sarcocyphos ehrhardtii* Corda f. *lobis* Gottsche et Rabenh. *nom. inval.* = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Sarcocyphos ehrhardtii Corda var. *micranthus* De Not. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Sarcocyphos ehrhardtii* Corda α *minor* Gottsche et Rabenh. *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Sarcocyphos ehrhardtii* Corda ε *montanus* J.B.Jack *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Sarcocyphos ehrhardtii* Corda f. *obtusus* Carrington *nom. inval.* = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Sarcocyphos ehrhardtii Corda var. δ *piceus* (Carrington) Gottsche et Rabenh. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Sarcocyphos ehrhardtii* Corda var. *procerus* Gottsche ex Limpr. *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.
**Sarcocyphos ehrhardtii* Corda f. *purpureo-brunneus* Nees ex Limpr. *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.
**Sarcocyphos ehrhardtii* Corda var. β *rivularis* Sw. ex De Not. *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.
Sarcocyphos ehrhardtii Corda var. *robustus* De Not. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Sarcocyphos ehrhardtii Corda δ *saccatus* Nees = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Sarcocyphos ehrhardtii Corda f. *tenuior* Rabenh. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Sarcocyphos emarginatus (Ehrh.) Spruce ≡ *Marsupella emarginata* (Ehrh.) Dumort.
Sarcocyphos emarginatus (Ehrh.) Spruce var. *aquaticus* (Lindenb.) Austin ≡ *Marsupella aquatica* (Lindenb.) Schiffn.
Sarcocyphos emarginatus (Ehrh.) Spruce var. *arcticus* Berggr. ≡ *Marsupella arctica* (Berggr.) Bryhn et Kaal.
Sarcocyphos emarginatus (Ehrh.) Spruce var. *densifolius* (Nees) Breidl. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Sarcocyphos emarginatus* (Ehrh.) Spruce var. *gracilis* Payot *nom. inval.* = *Marsupella aquatica* (Lindenb.) Schiffn.
Sarcocyphos emarginatus (Ehrh.) Spruce var. *major* (Carrington) Husn. = *Marsupella aquatica* (Lindenb.) Schiffn.
Sarcocyphos emarginatus (Ehrh.) Spruce f. *minor* Lamy = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Sarcocyphos filiformis (Lindb.) Warnst. = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Sarcocyphos funckii (F.Weber et D.Mohr) Nees ≡ *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
**Sarcocyphos funckii* (F.Weber et D.Mohr) Nees f. γ *alpestris* Saut. *nom. inval.* = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
**Sarcocyphos funckii* (F.Weber et D.Mohr) Nees var. *decipiens* (C.Massal. et Carestia) Spruce *nom. inval.* = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Sarcocyphos funckii (F.Weber et D.Mohr) Nees γ *diffusus* Nees = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Sarcocyphos funckii (F.Weber et D.Mohr) Nees β* *exiguus* Gottsche, Lindenb. et Nees = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Sarcocyphos funckii (F.Weber et D.Mohr) Nees var. *gracilescens* (Huebener) P.Kumm. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Sarcocyphos funckii (F.Weber et D.Mohr) Nees α *major* Nees = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.

Sarcocyphos funckii (F.Weber et D.Mohr) Nees β *minor* Nees = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
**Sarcocyphos funckii* (F.Weber et D.Mohr) Nees var. *obtusifolius* Payot *nom. inval.* = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Sarcocyphos funckii (F.Weber et D.Mohr) Nees f. *robustior* Gottsche et Rabenh. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Sarcocyphos fuscus Nees ex P.Kumm. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Sarcocyphos grandiretis Warnst. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Sarcocyphos gypsophilus (Wallr.) Nees = *Sphenolobus minutus* (Schreb. ex Crantz) Berggr.
Sarcocyphos intricatus (Lindb.) Warnst. = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
**Sarcocyphos jackii* Limpr. *nom. inval.* = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Sarcocyphos kerguelenus Schiffn. = *Acrobolbus ochrophyllus* (Hook.f. et Taylor) R.M.Schust.
**Sarcocyphos lapponicus* Limpr. ex Loitl. *nom. inval.* = *Marsupella boeckii* (Austin) Lindb. ex Kaal.
Sarcocyphos laxifolius Mont. ≡ *Hypolophozia laxifolia* (Mont.) Váňa et J.J.Engel
Sarcocyphos mexicanus Lindenb. et Gottsche = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Sarcocyphos muelleri Nees = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Sarcocyphos muelleri Nees var. β *liguricus* Gottsche = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Sarcocyphos muelleri Nees var. *pulvinatus* (Raddi) De Not. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Sarcocyphos neesii* Nees ex Sande Lac. *nom. inval.* ≡ *Marsupella neesii* (Nees ex Sande Lac.) Sande Lac. ex Schiffn.
Sarcocyphos neglectus Limpr. = *Marsupella sprucei* (Limpr.) Bernet
Sarcocyphos neglectus Limpr. var. *ustulatus* (Spruce) Breidl. = *Marsupella sprucei* (Limpr.) Bernet
Sarcocyphos obcordatus Berggr. ≡ *Scapania obcordata* (Berggr.) S.W.Arnell
**Sarcocyphos pectinatus* Limpr. ex Payot *nom. inval.* = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
Sarcocyphos perigonialis (Hook.f. et Taylor) Taylor et Hook.f. ex Gottsche, Lindenb. et Nees ≡ *Andrewsianthus perigonialis* (Hook.f. et Taylor) R.M.Schust.
**Sarcocyphos piceus* Carrington *nom. inval.* = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Sarcocyphos pulvinatus (Raddi) Trevis. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
Sarcocyphos pygmaeus Limpr. = *Marsupella funckii* (F.Weber et D.Mohr) Dumort.
Sarcocyphos revolutus Nees ≡ *Apomarsupella revoluta* (Nees) R.M.Schust.
Sarcocyphos robustus (De Not.) Limpr. = *Marsupella emarginata* (Ehrh.) Dumort. subsp. *emarginata*
**Sarcocyphos schismoides* Hampe ex Gottsche et Rabenh. *nom. inval.* = *Gymnomitrion alpinum* (Gottsche ex Husn.) Schiffn.
Sarcocyphos silvrettae (Gottsche ex Dumort.) Steph. = *Nardia geoscyphus* (De Not.) Lindb.
Sarcocyphos sparsifolius Lindb. ≡ *Marsupella sparsifolia* (Lindb.) Dumort.
Sarcocyphos sparsifolius Lindb. f. β *minor* (Schleich. ex Lindb.) Gottsche et Rabenh. = *Gymnomitrion brevissimum* (Dumort.) Warnst.
Sarcocyphos sparsifolius Lindb. var. *noricus* Limpr. = *Marsupella sparsifolia* (Lindb.) Dumort. subsp. *sparsifolia*
Sarcocyphos sphacelatus (Giesecke ex Lindenb.) Nees ≡ *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Sarcocyphos sphacelatus (Giesecke ex Lindenb.) Nees b *erythrorhizus* (Limpr.) Limpr. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Sarcocyphos sphacelatus (Giesecke ex Lindenb.) Nees var. *medius* Gottsche = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
**Sarcocyphos sphacelatus* (Giesecke ex Lindenb.) Nees f. *pusillus* Parrique *nom. inval.* = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Sarcocyphos sprucei Limpr. ≡ *Marsupella sprucei* (Limpr.) Bernet
Sarcocyphos sprucei Limpr. var. *decipiens* Limpr. = *Marsupella sprucei* (Limpr.) Bernet
Sarcocyphos styriacus Limpr. = *Marsupella sparsifolia* (Lindb.) Dumort. subsp. *sparsifolia*
Sarcocyphos sullivantii De Not. = *Marsupella sphacelata* (Giesecke ex Lindenb.) Dumort.
Sarcocyphos ustulatus (Spruce) Kiaer = *Marsupella sprucei* (Limpr.) Bernet
**Schisma concinnatum* (Lightf.) Dumort. *nom. inval.* ≡ *Gymnomitrion concinnatum* (Lightf.) Corda
Sphenolobus incompletus (Gottsche) Steph. ≡ *Gymnomitrion incompletum* (Gottsche) R.M.Schust. ex Váňa
Sphenolobus laceratus Steph. = *Gymnomitrion bolivianum* (Steph.) Váňa
Sphenolobus yakushimensis Horik. ≡ *Marsupella yakushimensis* (Horik.) S.Hatt.

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