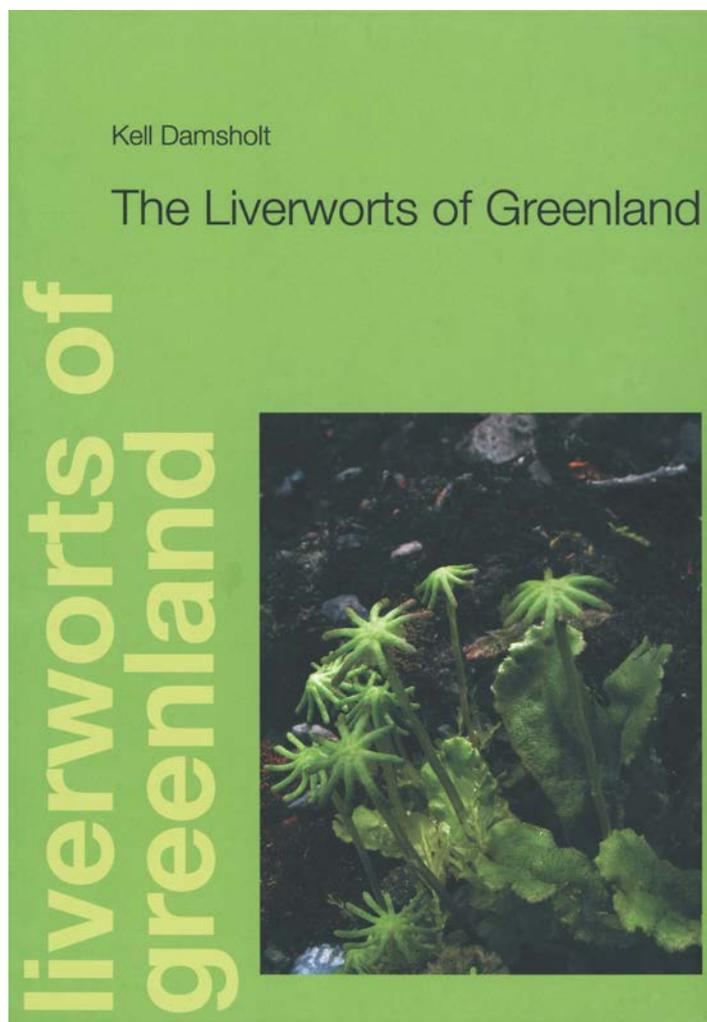


**New Books**

**Damsholt K. (2013): *The liverworts of Greenland*.** Nordic Bryological Society, Lund, 626 pages, 193 figures, 192 plates, hardcover, format 27.0 × 19.3 cm. ISBN 978-91-637-2514-2. Price 80.00 €

Beside lichens bryophytes are the main constituents of the flora in the polar regions. Although their diversity is here relatively low, studies on these plants are for various reasons more difficult than in other climatic zones of the Earth. Major logistic problems associated with the exploration of the polar regions and consequently the limited availability of herbarium specimens impede the proper interpretation of variability of many species. They usually exhibit remarkable phenotypic plasticity in the extremely harsh climatic conditions. These general statements are particularly appropriate to liverworts which are important but still poorly studied components of the arctic flora, both taxonomically and phytogeographically. The problems associated with the accurate definition of the Arctic itself certainly are not helpful for resolving these issues and consequently any part of the northern polar region has hitherto received a separate descriptive Flora of liverworts. They are usually included in general Floras of northern regions of the Earth, for example in the five-volume Flora of the northern regions of the former Soviet Union, i.e. in practice Russia (Shlyakov 1976–1982) or in the Flora of liverworts and hornworts of Nordic countries (Damsholt 2002). In contrast to Eurasia, the Nearctic hepatics are less studied and only the eastern part of the Canadian Arctic Archipelago (Nunavut)



is cursorily covered in the monumental Flora of eastern North America (Schuster 1966–1992). This galling gap in the bryological literature is now filled by the liverwort Flora of Greenland.

The first catalogue of the liverworts of Greenland was published 125 years ago as a part of *Conspectus florum groenlandicae* (Lange & Jensen 1887). The author of the present Flora started his studies in Greenland in the early 1970s, often in association with the eminent American hepaticologist R. M. Schuster. They published jointly a treatment on the Hepaticae of West Greenland (Schuster & Damsholt 1974) which comprised an enumeration of species recorded in this area with extensive taxonomic and ecological notes and local distribution maps. A similar treatment was planned also for the liverworts of South Greenland, but only a taxonomic and ecological treatment was published (Schuster 1988). The complementary part on phytogeography and local distribution of liverwort species in this region which was intended by K. Damsholt has never been completed. This has been more than ably compensated a quarter of a century later by the publication of the present work, the first descriptive Flora of liverworts in the Arctic. In 2002, Damsholt described the hepatics of Svalbard, the largest archipelago in the European Arctic, but this treatment dealt with a much broader area covering also boreal and temperate parts of Fennoscandia.

The present Flora is completed closely following the same format as the aforementioned Flora of Nordic liverworts and hornworts. In a short introductory part the author presents a concise outline of taxonomic problems faced by every researcher of arctic liverworts, with special emphasis on polyploidy which often has its morphological expression in exceptionally enlarged leaf cells. Here, the author deals also with phytogeography and origin of Greenland liverworts, their distribution patterns, habitats and reproduction. This part constitutes

merely ten pages and is a small fraction of the whole opus which almost entirely (over 570 pages) is occupied by the taxonomic treatment.

The liverworts of Greenland constitute one of the major liverwort floras in the Arctic which totals about 178 species with many infraspecific taxa (so far no hornworts have been detected from this island). The Greenland flora is dominated by three families of leafy hepatics, namely Jungermanniaceae (with *ca* 63 species), Scapaniaceae (with *ca* 28 species) and Gymnomitriaceae (with *ca* 17 species) which in total consist of about 108 species, i.e. almost two thirds of the whole flora. The author adopts the traditional system of the classification, rightly ignoring various classificational novelties resulting from the application of the molecular techniques, since many new concepts and circumscriptions of taxa have never been properly verified and tested.

All taxa are described in great detail and most of them are illustrated with excellent line drawings which are composed into 192 plates. It is surprising that none of the plates are referenced by the taxon concerned, the only exception being the plate with *Jungermannia sphaerocarpa* Hook. subsp. *purpurea* (R.M.Schust. & Damsh.) Damsh. A closer analysis of the plates shows that almost all are reproduced from *Illustrated Flora of Nordic liverworts and hornworts* or they comprise the same details but only arranged in a different way. Unfortunately, with the exception of *J. sphaerocarpa* subsp. *purpurea*, taxa exclusively occurring in Greenland and the American Arctic have not been illustrated, including *Jungermannia gracillima* Sm. subsp. *arctica* Damsh., the only taxon newly described from Greenland in the present Flora.

For each species and infraspecific taxon bibliographic data, basionym, type and selected heterotypic and homotypic synonyms are provided. Sometimes these data are not accurate, for example the author gives the information that the type of *Lophozia rutheana* (Limpr.) M.Howe originated from Germany, whilst in fact this species was described by K. G. Limpricht on the basis of specimens collected by R. Ruthe from Mieszkowice in Western Pomerania in Poland. Morphological descriptions of taxa are very detailed and meticulous and, additionally, the author provides a thorough discussion on diagnostic characters of the taxa, describes habitat requirements and presents local and global distribution of each. The distribution of species and subspecies in Greenland is mapped but, unfortunately, the maps are not clear enough due to the excessive reduction and too small black dots which are not sharply delimited from the dense grey screen covering ice-free areas.

Treatments of this sort contain an enormous mass of information and require great erudition and wide knowledge of the literature from their authors. Therefore it is difficult to avoid various errors and inaccuracies. In this case they often refer to global distribution of some species. For example, the author overlooked that *Scapania obcordata* (Berggr.) S.W.Arnell was discovered in the Antarctic already in 1989. Likewise, in 2010 *Prasanthus suecicus* (Gottsche) Lindb. was found on subantarctic Prince Edward Island. These two species must be thus considered as bipolar, not circumpolar arctic species.

There are only a few taxonomic novelties which are expressed as nomenclatural changes. This is because various new concepts were published separately in earlier papers, this being a normal custom in taxonomy if an author wishes to retain priority in the presentation of new taxonomic ideas. Apart from the aforementioned new subspecies, the author reduced *Scapania paradoxa* R.M.Schust. to the rank of variety within *S. obcordata*, whilst *Lophozia subapiculata* R.M.Schust. & Damsh. is considered as a variety of *L. ventricosa* (Dicks.) Dumort. In total, only five new combinations were proposed. It is unfortunate that these have not been listed separately at the end of the book, a present practice in various Floras and botanical taxonomic journals. However, an interesting novelty is a list of all new taxa of liverworts described from material collected in Greenland with the citation of the type and information on the current taxonomic status. The list consists of 98 names of taxa, most of which is currently accepted. To this list should be added *Jungermannia gracillima* subsp. *arctica* described by the author in the present Flora.

The nomenclature of taxa is very correct, although the author repeated some errors from the *Illustrated Flora of Nordic liverworts and hornworts*. Some of them were pointed out in the review of this book (Ochyra, 2004) including the indication that the correct name for *Mylia* Gray sect. *Verrucosae* R.M.Schust. is sect. *Mylia* because this section comprises *M. taylorii* (Hook.) Gray, the lectotype species of the generic name *Mylia* and automatically must be considered as the type section of the genus which should correctly be named sect. *Mylia*. Likewise, the correct name for *Cephaloziella varians* (Gottsche) Steph. var. *arctica* (Bryhn & Douin) Damsh. is *C. varians* var. *kaalaasii* (Douin) Ochyra because the epithet *kaalaasii* is the oldest available name for this taxon in the rank of variety.

The Flora is nicely and attractively published. It is the second *opus magnum* of the author crowning his long and extensive studies on arctic liverworts. At the same time it is a magnificent gift for all students of the vegetation of Greenland as well as coterminous territories of the Nearctic. It is rare that in the current period of great crisis for classical taxonomy, someone could attempt to produce an analytical Flora for this vast area. It is because such work needs great experience which can be achieved only through decades of constant study of these plants under the microscope in the laboratory and herbarium and in the field. Luckily, works of this kind grow old rather slowly and therefore one can be sure that this Flora will serve for arctic botanists for all times.

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