

Identification Keys to the Liverworts and Hornworts of Europe and Macaronesia

(Distribution and Status)

2nd revised edition

by

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Foreword to the second edition

The first edition of the *Identification Keys to Liverworts and Hornworts of Europe and Macaronesia* in 2000 was very successful: some 400 copies were sold, mostly in Europe, but also in other parts of the World.

This success was mainly due to the quality of the keys, especially in difficult genera, covering, for the first time, the liverworts and hornworts of Europe and Macaronesia, providing a unique tool for their identification.

Of course, we were very conscious that our work was not perfect.

Thanks to comments, remarks, questions of many users encountering difficulties – especially in the keys to genera or in some keys for large genera – from students, beginners, experimented hobby – and professional bryologists, as to recently published books and papers, we started since 2003 to prepare this 2nd revised and enriched edition.

This 2nd edition provides, a.o., new (or partly new) keys for *Conocephalum*, *Fossombronia*, *Herbertus*, *Lepidozia*, *Lophozia*, *Plagiochila*, *Riccia*, *Scapania*, *Telaranea*, etc., numerous new keys for subspecies or varieties, updated distribution data, many corrections to patronyms, an impressive number (ca. 400!) of new synonyms in the corpus as in the index and many new useful literature references and illustrations until August 2005.

The main authors are greatly indebted to all interested colleagues who kindly contributed to the quality of this 2nd edition.

They will be also grateful for further critical positive remarks and suggestions for a better 3rd edition.

August 2005

Hon. Prof. Dr. René Schumacker
and Hon. Prof. Dr. Jiří Váňa

1. Introduction

Identifying hepatics – liverworts and hornworts – from Europe and Macaronesia is not an easy task, either for beginners or for experienced bryologists.

The main reason for this lies not so much in their number (only 108 genera [3 *Anthocerotophyta*, 105 *Marchantiophyta*] and ca. 461 species), but in the lack of a modern, comprehensive, well documented and well-illustrated recent flora or, until very recently, a comprehensive critical check-list of the taxa occurring in this area, although it has been relatively intensively worked for more than 200 years!

Literature is scattered and often difficult to find. Illustrations are often very poor, or even completely lacking for some species. Some very important books are extremely expensive, especially for students and for hobby bryologists. This is very unfortunate, because amateurs have been, and still are, responsible for a large part of our knowledge of this group of plants in Europe and Macaronesia.

The last exhaustive European liverwort and hornwort flora, by the famous hepaticologist K. Müller, covering Europe and part of North Africa (but not Macaronesia = Canary, Madeira and Azores Islands) was published more than 50 years ago (1951-1958).

Since that time, there have been considerable advances in our knowledge of the European and Macaronesian liverworts and hornworts, as shown by the important lists of Grolle (1983) and Grolle & Long (2000), the check-lists with distributional data of Düll (1983), Söderström et al. (2002), Dierssen (2001), the publication of several excellent books, including Smith (1990), Schuster (1969-1992) and especially Paton (1999) and Damsholt (2002).

Modern monographs or new keys for some difficult genera, in Europe or significant parts of it, have been published, notably:

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|--|--|
| <i>Acantholejeunea</i> = <i>Dicranolejeunea</i> (Grolle, 1966, Kruijt, 1988) | <i>Lophozia</i> subgen. <i>Schistochilopsis</i> (Bisang, 1991) |
| <i>Adelanthus</i> (Grolle, 1972a) | <i>Marchantia</i> (Bischler-Causse, 1993) |
| <i>Anthelia</i> (Schnyder, 1988) | <i>Metzgeria</i> (Kuwahara, 1976) |
| <i>Bazzania</i> (Grolle, 1972b) | <i>Nardia</i> (Váňa, 1976) |
| <i>Calypogeia</i> (Bischler, 1970) | <i>Plagiochila</i> (Schumacker & Lecointe, 1989; Heinrichs et al., 1998, 2002; Rycroft et al., 2001, 2002, 2004) |
| <i>Cephaloziella</i> (Pierrot, 1988) | <i>Radula</i> (Bouman & Dirkse, 1992) |
| <i>Cololejeunea</i> (Sjögren, 1975; Grolle, 1985) | <i>Riccia</i> (Jovet-Ast, 1986) |
| <i>Frullania</i> (Bisang et al., 1988) | <i>Riella</i> (Cirjuano et al., 1988; Skrzypczak, 2001) |
| <i>Jamesoniella</i> (Grolle, 1971) | <i>Telaranea</i> (Paton, 1992; Engel & Smith Merrill, 2004) |
| <i>Jubula</i> (Guercke, 1978) | <i>Tetralophozia</i> (Urmi, 1983) |
| <i>Jungermannia</i> (Váňa, 1973a, 1973b, 1974, 1975) | <i>Tylimanthus</i> (Grolle & Persson, 1966) |
| <i>Kurzia</i> (Stieperaere & Schumacker, 1988) | |
| <i>Leptoscyphus</i> (Grolle, 1963) | |

There have also been many check-lists and red lists in different countries. However, no critical, reliable work covering this important biogeographical area was available until recently (Söderström et al., 2002).

Modern floras (published after 1980) have been produced for only a limited number of countries or regions: British Isles (Smith, 1990) and, very recently, the monumental and richly illustrated work of Paton (1999), SW-France (Pierrot, 1982) without illustrations, The Netherlands (Margadant & During, 1982) with excellent keys and illustrations and the nicely illustrated atlas by Landwehr (1980) and flora by Gradstein & van Melick (1996), Hungary (Orbán & Vajda, 1983), with keys and illustrations, Romania (Mohan, 1984) with keys and illustrations, Fennoscandia (Damsholt, 2002) with keys and splendid illustrations, Basque Country (Infante, 2000) and Catalonia (Casas et al., 2004). One will also find beautiful illustrations of some 25 species occurring in Europe in Wigginton [ed.] (2004), some of them never fully illustrated before.

There have also been some students' bryophyte handbooks, a.o. for Germany and surrounding countries with the exception of the High Alps (Frahm & Frey, 2004), Sweden (Hallingbäck & Holmåsén, 1985) with excellent keys and colour photographs (but only for a limited number of species), and lastly, a key with fairly good illustrations, for all species of Europe excluding Macaronesia (Frey et al., 1995, in German).

Older floras (see note below), although sometimes still partly useful, are mostly out of date, in many respects because they take no account of more recently described taxa and other taxonomic works.

Note. Belgium and G.-D. Luxemburg (Vanden Berghen, 1979), Czech and Slovak Republics (Pilous & Duda, 1960), Fennoscandia (Arnell, 1956b), France (Augier, 1966), Iberian Peninsula (Casares-Gil, 1918-1919), Italy (Zodda, 1934), Poland (Rejment-Grochowska, 1966: thallose liverworts only), N-Russia (Schljakov, 1976-1982), Switzerland (Meylan, 1924), Ukraine (Zerov, 1964), former Yugoslavia (Pavletić, 1968).

Furthermore, most floras and identification keys are restricted to the taxa occurring within national or regional boundaries, although there is now a general agreement that many of these plants have a very large distribution, at least in the Northern Hemisphere, owing to their very ancient origin in the Devonian and their wide dispersal capacity.

It is now very clear that national or regional floras, although useful, are of only limited use and that producing floras for cryptogams over wider areas seems more appropriate. For instance, out of the total number of liverworts and hornworts recorded in Europe and Macaronesia (ca. 461), ca. 310 species and subspecies are recorded from France incl. Corsica, ca. 290 from British Isles, ca. 288 from Italy, ca. 265 from the Iberian Peninsula, ca. 256 from Switzerland, ca. 246 from Germany, ca. 240 from former Czechoslovakia, etc. Every year, there are additions to our knowledge: new species, new – seemingly disjunct – localities of rare, overlooked or completely unexpected species in a given area!

However, to produce a new flora for European and Macaronesian liverworts and hornworts, with exhaustive descriptions, full illustrations, ecology, distribution, etc., would not only require many years of hard work and a lot of money for a team of good specialists and illustrators, but such a book would also probably be too expensive for students or hobby bryologists.

That is the reason why, in 1994, the main authors decided to produce an easily accessible basic identification key of European and Macaronesian liverworts and hornworts.

Unfortunately, due to the lack of funding possibilities, this edition as the first one, is not richly illustrated as we first intended, with at least a limited number of useful illustrations of special or unusual morphological features in difficult genera, groups of species or poorly illustrated species. But for each genus, references to important books or publications with good illustrations are given.

In case of difficulties, please ask the main authors, who may be able to provide some illustrations that are no longer covered by copyright.

At the right of keys, one third of the page free of text may be used to introduce small illustration or own drawings of difficult or subtle characters in some dichotomies (see examples under *Aphanolejeunea*, *Frullania*, *Marsupella*, etc.).

Some species known from W-Siberia, Caucasus, N-Africa, Greenland, Central America, as likely to be found in Europe and Macaronesia, have been introduced in the keys.

This second edition is again published in English, the most accessible international language for scientific publications.

A glossary is not included because excellent and illustrated glossaries are available a.o. in Smith (1990), Paton (1999) and Damsholt (2002) (all books that should normally be present on the shelves of every European hobby or professional bryologist) as well as the extraordinary well illustrated glossary of Malcolm & Malcolm (2000).

The *Glossarium Polyglottum Bryologiae* (Magill [ed.], 1990) is also recommended.