

## Check- and Red List of bryophytes of the Czech Republic (2003)

Seznam a Červený seznam mechorostů České republiky (2003)

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The second version of the checklist and Red List of bryophytes of the Czech Republic is provided. Generally accepted infraspecific taxa have been incorporated into the checklist for the first time. With respect to the Red List, IUCN criteria version 3.1 has been adopted for evaluation of taxa, and the criteria used for listing in the respective categories are listed under each red-listed taxon. Taxa without recent localities and those where extinction has not been proven are listed as a subset of DD taxa. Little known and rare non-threatened taxa with incomplete knowledge of distribution which are worthy of further investigation are listed on the so-called attention list. In total, 849 species plus 5 subspecies and 19 varieties have been accepted. 23 other historically reported species and one variety were evaluated as doubtful with respect to unproven but possible occurrence in the territory, and 6 other species with proven occurrence require taxonomic clarification. 43 taxa have been excluded from our flora compared to the last checklist version. 48.6 % of evaluated taxa have been listed in either of the Red List categories (EX (RE), CR, EN, VU, LR or DD), which is comparable to other industrialized regions of Central Europe.

**Key words:** checklist, Red List, threatened taxa, mosses, liverworts, hornworts, Czech Republic

### Introduction

Ten years have passed since the publication of the preliminary version of the Red List of hornworts and liverworts of the Czech Republic (Váňa 1993) and eight years since the respective treatment of the mosses (Váňa 1995). Those lists reflected the very unsatisfactory situation in the field of bryofloristics in the post-war period. The situation regarding floristic surveys in the Czech Republic and the allocation of Red List criteria has improved substantially in the last few years. It is therefore a good opportunity to reassess the current threat status of our bryophytes according to the new IUCN criteria (version 3.1, 2001). We decided to publish the new version of the Red List as a subset of the present revised checklist in compliance with the recommendations of IUCN and Planta Europa (the last version was published six years ago – Váňa 1997).

### Methods

The first stage of the project was to compile a new and up-to-date checklist of the bryophytes of the country. We have made one major change in the selection of taxa for the checklist. Only taxa accepted by the author at the specific level were listed in the previous

versions, but in the present version we also list generally accepted infraspecific taxa. Recognizing infraspecific taxa is always a controversial topic and we have not attempted to make any critical assessment of the taxonomy. We have tried to reduce the number of infraspecific taxa to a minimum, but at the same time we have considered it necessary to include taxa in which genetic distinctness was either proven or was very likely to be proven in the future.

Doubtful taxa of the previous checklist (Váňa 1997) were re-evaluated, including taxa based solely on literature sources. Therefore we tried to examine the specimens of every taxon. Among the taxa, which should be revised, we were only unable to trace *Rhynchostegiella tenuicaulis*.

The second stage involved gathering maximum information on the current distribution of all accepted taxa, with the emphasis on obtaining at least some quantitative data on the respective populations. As expected, for many taxa this proved to be impossible.

The third and final stage consisted of evaluating the data against the latest IUCN Red List criteria (IUCN 2001) with respect to the application guidelines for bryophytes (Hallingbäck et al. 1998). The application of individual criteria A-E (according to IUCN 2001) followed this scheme:

Criterion A (reduction in population size in the past or the probability of a reduction in the future). Based on the data we had available, this criterion could not be reasonably applied. The reason for this is the absence of surveillance programmes for the threatened species at their localities in recent (ten or so) years. We declined to apply the three-generation limit in case of long-lived bryophytes (up to 75 years for three generations suggested by Hallingbäck et al. 1998), mainly because of the general absence of effective sexual reproduction.

Criterion B (small geographic range and estimates of at least two of the following: (i) severe fragmentation or 1(CR), < 5(EN), < 10(VU) localities, (ii) continuing decline or (iii) extreme fluctuations). This criterion was the least problematical in most cases, particularly with respect to the geographic range, number of localities and the continuing decline inferred from the area, extent and/or quality of the habitat. Localities were considered recent if the information was no more than 20 years old and we had no information about the recent destruction of the site. Exceptionally, this limit has been extended to the mid-1970s (ca. 25 yrs).

Criterion C (small populations together with a continuing decline observed or inferred in individual numbers, unfavourable population structure or extreme fluctuations) was used in many cases, especially in rare bryophytes, despite the general lack of quantitative data. The definition of an individual in bryophytes is debatable but we often used turfs or patches as the equivalent to an individual (the recommendation given by Hallingbäck et al. 1998).

Criterion D (very small population size or very restricted area of occupancy irrespective of other factors) has sometimes been used for rare taxa with no obvious decline and/or threat to their habitat (equivalent of the 'Rare' category of old IUCN criteria, used in the previous red lists).

Criterion E (quantitative analysis showing the probability of extinction in the wild) has not been used due to the lack of such data for bryophytes in the Czech Republic.

The categories used in the present check- and Red List are given in the IUCN guidelines, version 3.1. RE (regionally extinct, used instead of EX (extinct) as there are no

endemics amongst the extinct taxa of our flora), CR (critically endangered), EN (endangered), VU (vulnerable), LR-nt (lower risk – near threatened) and DD (data deficient). We decided to establish a new subcategory of DD, denoted DD-va (vanished). Taxa are evaluated as vanished when there is no recent (for definition of recent see above) information on the existence of any individual in the wild, but when there is (in contrast to the definition of EX) a reasonable doubt that the last individual has died (either the respective historical localities have not been adequately searched, or unsearched localities with high potential to support the taxon exist). The evaluated taxa that are not classified in any of the preceding categories are regarded as not threatened at present and are called Least Concern (LC) in terms of the IUCN categories. We have established one more informal subcategory in the LC taxa, called the Attention list (LC-att). Taxa are included in this list if they have not met the criteria for inclusion in the LR-nt category but at the same time could not be placed in LC-nt (not threatened) category with sufficient certainty. Not evaluated (NE) are taxa of controversial taxonomic status or doubtful historical occurrence in our country. It has to be stressed that the phrase ‘doubtful historical occurrence’ has a somewhat broader sense than is usual in most recent checklists; we have accepted only taxa of which at least one specimen has been revised by either of us or we have evaluated the source of information as fully credible. The latter case is indicated in the present checklist and annotations.

Taxa listed as excluded in Váňa (1997) are not repeated in the present checklist unless their status has been changed.

## Species list

### Hornworts

- Anthoceros agrestis* Paton **LC**  
*Anthoceros neesii* Prosk. **DD-va**  
*Notothylas orbicularis* (Schwein.) A. Gray **DD-va**  
*Phaeoceros carolinianus* (Michx.) Prosk. **LC-att**

### Liverworts

- Anastrepta orcadensis* (Hook.) Schiffn. **LC**  
*Anastrophyllum hellerianum* (Nees ex Lindenb.) R. M. Schust. **CR** [B1ab(iii,iv,v)+2ab(iii,iv,v); C2a(i)]  
*Anastrophyllum michauxii* (F. Weber) H. Buch **EN** [B1ab(iii,iv,v)+2ab(iii,iv,v); C2a(i)]  
*Anastrophyllum minutum* (Schrad.) R. M. Schust. **LC** – Only in var. *weberi* (Mart.) Kartt.  
*Anastrophyllum saxicola* (Schrad.) R. M. Schust. **EN** [B1ab(iii)+2ab(iii)]  
*Aneura pinguis* (L.) Dumort. **LC**  
*Anthelia julacea* (L.) Dumort. **VU** [D2]  
*Anthelia juratzkana* (Limpr.) Trevis. **CR** [B1ab(iii,iv,v)+2ab(iii,iv,v); C2a(ii)]  
*Apometzgeria pubescens* (Schrank) Kuwah. **LC**  
*Asterella gracilis* (F. Weber) Underw. **CR** [C2a(i)]  
*Asterella saccata* (Wahlenb.) A. Evans **EN** [B2ab(iii)]  
*Bazzania flaccida* (Dumort.) Grolle **EN** [C2a(i)]  
*Bazzania tricrenata* (Wahlenb.) Lindb. **VU** [C2a(i)]  
*Bazzania trilobata* (L.) Gray var. *trilobata* **LC**  
*Bazzania trilobata* var. *depauperata* (Müll. Frib.) Grolle **LC-att**  
*Blasia pusilla* L. **LC**  
*Blepharostoma trichophyllum* (L.) Dumort. **LC** – Only in var. *trichophyllum*.  
*Calypogeia azurea* Stotler et Crotz **LC**  
*Calypogeia fissa* (L.) Raddi **LR-nt** [C2a(i)]

- Calypogeia integrispula* Steph. **LC**  
*Calypogeia muelleriana* (Schiffn.) Müll. Frib. **LC**  
*Calypogeia neesiana* (C. Massal. et Carestia) Müll. Frib. **LC**  
*Calypogeia sphagnicola* (Arnell et J. Perss.) Warnst. et Loeske **LC**  
*Calypogeia suecica* (Arnell et J. Perss.) Müll. Frib. **LR-nt** [B2ab(iii); C2a(i)]  
*Cephalozia bicuspidata* (L.) Dumort. (incl. subsp. *lammersiana* (Huebener) R. M. Schust.) **LC**  
*Cephalozia catenulata* (Huebener) Lindb. **VU** [C1a(i)+2a(i)]  
*Cephalozia connivens* (Dicks.) Lindb. **LC**  
*Cephalozia lacinulata* J. B. Jack ex Spruce **RE**  
*Cephalozia leucantha* Spruce **VU** [C1a(i)+2a(i)]  
*Cephalozia loitlesbergeri* Schiffn. **VU** [C1a(i)+2a(i)]  
*Cephalozia lunulifolia* (Dumort.) Dumort. **LC**  
*Cephalozia macrostachya* Kaal. **VU** [D2]  
*Cephalozia pleniceps* (Austin) Lindb. **VU** [B2ab(iii)]  
*Cephaloziella divaricata* (Sm.) Schiffn. **LC**  
*Cephaloziella elachista* (J. B. Jack ex Gottsche et Rabenh.) Schiffn. **VU** [B2ab(iii)]  
*Cephaloziella elegans* (Heeg) Schiffn. **DD-va**  
*Cephaloziella grimsulana* (J. B. Jack ex Gottsche ex Rabenh.) Lacout. **EN** [C2a(i)]  
*Cephaloziella hampeana* (Nees) Schiffn. **DD** – Ca. 5 recent localities in non-threatened habitats. The localities mostly in undercollected areas, therefore the number probably underestimated and the category **VU** or **LR-nt** [D2] would be unjustified.  
*Cephaloziella rubella* (Nees) Warnst. **LC**  
*Cephaloziella spinigera* (Lindb.) Warnst. **VU** [D2]  
*Cephaloziella stellulifera* (Taylor ex Spruce) Schiffn. **DD** – One recent locality without an obvious threat. The same applies as to *C. hampeana*.  
*Chiloscyphus coadunatus* (Sw.) J. J. Engel et R. M. Schust. **LC**  
*Chiloscyphus minor* (Nees) J. J. Engel et R. M. Schust. **LC**  
*Chiloscyphus polyanthos* (L.) Corda var. *polyanthos* **LC**  
*Chiloscyphus polyanthos* var. *pallescens* (Ehrh. ex Hoffm.) C. Hartm. **LC-att**  
*Chiloscyphus profundus* (Nees) J. J. Engel et R. M. Schust. **LC**  
*Cladopodiella fluitans* (Nees) H. Buch **EN** [B2ab(iii,iv,v); C2a(i)]  
*Cladopodiella francisci* (Hook.) Jörg. **DD** – recent locality in the Krkonoše Mts, the population probably very small but possibly partly overlooked like *Cephaloziella stellulifera*.  
*Cololejeunea calcarea* (Lib.) Schiffn. **EN** [B2ab(iii,iv,v)]  
*Cololejeunea rosettiana* (C. Massal.) Schiffn. **EN** [B1ab(iii,iv,v)+2ab(iii,iv,v)]  
*Conocephalum conicum* (L.) Dumort. **LC**  
*Diplophyllum albicans* (L.) Dumort. **LC**  
*Diplophyllum obtusifolium* (Hook.) Dumort. **LC**  
*Diplophyllum taxifolium* (Wahlenb.) Dumort. **LC**  
*Fossombronia angulosa* (Dicks.) Raddi **RE**  
*Fossombronia foveolata* Lindb. **EN** [B1ab(iv,v)+2ab(iv,v); C2a(i)]  
*Fossombronia pusilla* (L.) Nees **DD-va**  
*Fossombronia wondraczekii* (Corda) Lindb. **LC**  
*Frullania dilatata* (L.) Dumort. **LC**  
*Frullania fragilifolia* (Taylor) Gottsche, Lindenb. et Nees **CR** [C2a(i)]  
*Frullania inflata* Gottsche **DD** – Only one pre-1980 locality, the current state or threat unknown.  
*Frullania tamarisci* (L.) Dumort. **VU** [B2ab(iii,v)]  
*Geocalyx graveolens* (Schrad.) Nees **EN** [B2ab(iii)]  
*Gymnocolea inflata* (Huds.) Dumort. **LC**  
*Gymnomitrium concinatum* (Lightf.) Corda **LR-nt** [C2a(i)]  
*Gymnomitrium corallioides* Nees **EN** [B2ab(iii,iv,v); C2a(i)]  
*Gymnomitrium obtusum* Lindb. **DD-va**  
*Haplomitrium hookeri* (Sm.) Nees **CR** [B2ab(iii); C2a(i)]  
*Harpanthus flotovianus* (Nees) Nees **LC**  
*Harpanthus scutatus* (F. Weber et D. Mohr) Spruce **DD-va**  
*Hygrobrella laxifolia* (Hook.) Spruce **CR** [C2a(i)] – Found recently at several sites in the National Park Bohemian Switzerland (Müller 2003).

- Jamesoniella autumnalis* (DC.) Steph. **VU** [B2ab(iii); C2a(i)]  
*Jamesoniella undulifolia* (Nees) Müll. Frib. **RE**  
*Jungermannia atrovirens* Dumort. **EN** [B2ab(iii); C2a(ii)]  
*Jungermannia caespiticia* Lindenb. **VU** [C2a(i); D2]  
*Jungermannia confertissima* Nees **EN** [B2ab(iii); C2a(i)]  
*Jungermannia gracillima* Sm. **LC**  
*Jungermannia hyalina* Lyell **LR-nt** [C2a(i)]  
*Jungermannia leiantha* Grolle **LR-nt** [B2ab(iii); C2a(i)]  
*Jungermannia obovata* Nees **LC**  
*Jungermannia pumila* With. **LR-nt** [C2a(i)]  
*Jungermannia sphaerocarpa* Hook. **LC**  
*Jungermannia subelliptica* (Lindb. ex Kaal.) Levier **VU** [C2a(i)]  
*Jungermannia subulata* A. Evans **DD-va**  
*Kurzia pauciflora* (Dicks.) Grolle **VU** [C2a(i)]  
*Kurzia sylvatica* (A. Evans) Grolle **LC-att**  
*Kurzia trichoclados* (Müll. Frib.) Grolle **VU** [D2]  
*Lejeunea cavifolia* (Ehrh.) Lindb. **LC**  
*Lepidozia reptans* (L.) Dumort. **LC**  
*Lophozia ascendens* (Warnst.) R. M. Schust. **EN** [B2ab(iii); C2a(i)]  
*Lophozia atlantica* (Kaal.) Müll. Frib. **DD-va**  
*Lophozia attenuata* (Mart.) Dumort. **LC**  
*Lophozia badensis* (Gottsche) Schiffn. **VU** [D2]  
*Lophozia bantrienis* (Hook.) Steph. **LC**  
*Lophozia barbata* (Schmidel ex Schreb.) Dumort. **LC**  
*Lophozia bicrenata* (Schmidel ex Hoffm.) Dumort. **LC-att**  
*Lophozia capitata* (Hook.) Macoun **EN** [B2ab(iii); C2a(i)]  
*Lophozia excisa* (Dicks.) Dumort. **LC-att**  
*Lophozia floerkei* (F. Weber et D. Mohr) Schiffn. **LC**  
*Lophozia grandiretis* (Lindb. ex Kaal.) Schiffn. **VU** [C2a(i)]  
*Lophozia hatcheri* (A. Evans) Steph. **LC**  
*Lophozia heterocolpos* (Thed. ex Hartm.) M. Howe **CR** [B2ab(iii,iv,v); C2a(i)]  
*Lophozia incisa* (Schrud.) Dumort. **LC-att**  
*Lophozia kunzeana* (Huebener) A. Evans **CR** [C2a(i)]  
*Lophozia longidens* (Lindb.) Macoun **LC-att**  
*Lophozia longiflora* (Nees) Schiffn. **LC**  
*Lophozia lycopodioides* (Wallr.) Cogn. **LC**  
*Lophozia obtusa* (Lindb.) A. Evans **EN** [B2ab(iii); C2a(i)]  
*Lophozia opacifolia* Culm. ex Meyl. **DD-va**  
*Lophozia quadriloba* (Lindb.) A. Evans **CR** [C2a(i)]  
*Lophozia sudetica* (Nees ex Huebener) Grolle **LC**  
*Lophozia ventricosa* (Dicks.) Dumort. var. *ventricosa* **LC**  
*Lophozia ventricosa* var. *silvicola* (H. Buch) E. W. Jones **DD** – Rarely recognized due to the necessity of identification of fresh material.  
*Lophozia wenzelii* (Nees) Steph. **EN** [B2ab(iii); C2a(i)]  
*Lunularia cruciata* (L.) Dumort. **LC**  
*Mannia fragrans* (Balbis) Frye et L. Clark **LC**  
*Mannia triandra* (Scop.) Grolle **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i,ii); D]  
*Marchantia polymorpha* L. subsp. *polymorpha* **LC**  
*Marchantia polymorpha* subsp. *montivagans* Bischl. et Boisselier **DD** – This subspecies is not always morphologically recognizable from subsp. *ruderalis*. If all morphologically fitting populations are referable here, the taxon might be evaluated as **LR-nt** [D2].  
*Marchantia polymorpha* subsp. *ruderalis* Bischl. et Boisselier **LC**  
*Marsupella adusta* (Nees emend. Limpr.) Spruce **RE**  
*Marsupella alpina* (Gottsche ex Husn.) Bernet **VU** [C2a(ii); D2]  
*Marsupella brevissima* (Dumort.) Grolle **RE**  
*Marsupella emarginata* (Ehrh.) Dumort. var. *emarginata* **LC**  
*Marsupella emarginata* var. *aquatica* Lindenb. **LC**

- Marsupella funckii* (F. Weber et D. Mohr) Dumort. **LR-nt** [B2ab(iii,v); C2a(i)]  
*Marsupella sparsifolia* (Lindb.) Dumort. **EN** [B1ab(iii,iv,v)+2ab(iii,iv,v); C2a(i)]  
*Marsupella sphacelata* (Gieseke ex Lindenb.) Dumort. **LC**  
*Marsupella sprucei* (Limpr.) Bernet **CR** [B1ab(iii,v)+2ab(iii,v)]  
*Metzgeria conjugata* Lindb. **LC**  
*Metzgeria fruticulosa* (Dicks.) A. Evans **EN** [B2ab(iii); C2a(i)]  
*Metzgeria furcata* (L.) Dumort. **LC**  
*Metzgeria simplex* Lorb. ex Müll. Frib. **DD-va**  
*Moerckia blyttii* (Moerch) Brocckm. **VU** [B2ab(iii,iv,v); C2a(i)]  
*Moerckia hibernica* (Hook.) Gottsche **CR** [B1ab(iii,iv,v)+2ab(iii,iv,v); C2a(i); D?]  
*Mylia anomala* (Hook.) Gray **LC**  
*Mylia taylorii* (Hook.) Gray **LC**  
*Nardia compressa* (Hook.) Gray **VU** [C2a(i); D2]  
*Nardia geoscyphus* (De Not.) Lindb. **LC-att**  
*Nardia insecta* Lindb. **DD-va**  
*Nardia scalaris* Gray **LC**  
*Nowellia curvifolia* (Dicks.) Mitt. **LC-att**  
*Odontoschisma denudatum* (Mart.) Dumort. **LC-att**  
*Odontoschisma sphagni* (Dicks.) Dumort. **CR** [B1ab(iii)+2ab(iii)]  
*Oxymitra incrassata* (Brot.) Sérgio et Sim-Sim **EN** [B2ab(iii)]  
*Pallavicinia lyellii* (Hook.) Carruth. **DD-va**  
*Pedinophyllum interruptum* (Nees) Kaal. **VU** [C2a(i)]  
*Pellia endiviifolia* (Dicks.) Dumort. **LC**  
*Pellia epiphylla* (L.) Corda **LC** – Both *Pellia epiphylla* and *P. endiviifolia* are genetically quite variable, and several enzymatically separated crypto-species have been documented (cf. e.g. Szweykowski et al. 1995). One of the cryptic taxa of *P. epiphylla* is sometimes specifically recognized *P. borealis* Lorb. The latter taxon has never been documented from the Czech Republic, though it probably occurs in our territory  
*Pellia neesiana* (Gottsche) Limpr. **LC**  
*Plagiochila asplenioides* (L. emend. Taylor) Dumort. **LC**  
*Plagiochila porelloides* (Torr. ex Nees) Lindenb. **LC**  
*Porella arboris-vitae* (With.) Grolle **CR** [B1ab(iii,v)+2ab(iii,v)]  
*Porella baueri* (Schiffn.) C. E. O. Jensen **DD** – Formerly not separated from *P. platyphylla*, therefore the distribution and threat unknown.  
*Porella cordaeana* (Huebener) Moore **LR-nt** [B2ab(iii); C2a(i)]  
*Porella platyphylla* (L.) Pfeiff. **LC**  
*Preissia quadrata* (Scop.) Nees **LC**  
*Ptilidium ciliare* (L.) Hampe **LC**  
*Ptilidium pulcherrimum* (L.) Dumort. **LC**  
*Radula complanata* (L.) Dumort. **LC**  
*Radula lindenbergiana* Gottsche ex C. Hartm. **VU** [D2]  
*Reboulia hemisphaerica* (L.) Raddi **LR-nt** [C2a(i)]  
*Riccardia chamaedryfolia* (With.) Grolle **DD** – Only one pre-1980 locality, the current state unknown but strong threat supposed. Will probably be moved into one of the highest risk categories following the next evaluation.  
*Riccardia incurvata* Lindb. **VU** [B2ab(iii,iv); C2a(i)]  
*Riccardia latifrons* (Lindb.) Lindb. **LC-att**  
*Riccardia multifida* (L.) Gray **LC-att**  
*Riccardia palmata* (Hedw.) Carruth. **LC-att**  
*Riccia bifurca* Hoffm. **DD** – Probably one recent locality (identification uncertain, specimen not seen by the authors), population strongly fluctuating.  
*Riccia canaliculata* Hoffm. **DD-va**  
*Riccia cavernosa* Hoffm. **VU** [C2b]  
*Riccia ciliata* Hoffm. **CR** [C2a(i)]  
*Riccia ciliifera* Link ex Lindenb. **LR-nt** [B2ab(iii,iv,v); C2a(i)]  
*Riccia crinita* Taylor **LR-nt** [C2a(i)]  
*Riccia fluitans* L. **LC**  
*Riccia glauca* L. **LC**

- Riccia gougetiana* Durieu et Mont. **DD** – The recent status of populations unknown due to the occurrence in unsurveyed regions but at least some stable populations still expected. There are problems with the delimitation of Central European populations against the rather common *R. ciliifera*.
- Riccia huebeneriana* Lindenb. **DD** – Only one recent locality, the threat factors unknown. More populations expected in lowland areas where systematic survey is lacking.
- Riccia papillosa* Moris **EN** [B2ab(iii)]
- Riccia rhenana* Lorb. **DD** – There is little recent information on the occurrence, probably due to the difficult field recognition from the common *R. fluitans*.
- Riccia sorocarpa* Bisch. **LC**
- Riccia warnstorffii* Limpr. ex Warnst. **DD** – Only one recent locality but others expected in undercollected areas.
- Ricciocarpos natans* (L.) Corda **LC**
- Scapania aequiloba* (Schwägr.) Dumort. **LC-att**
- Scapania aspera* Bernet et M. Bernet **EN** [B1ab(iii,iv,v)+2ab(iii,iv,v); C2a(i)]
- Scapania calcicola* (Arnell et J. Perss.) Ingham **VU** [C2a(i); D2]
- Scapania carinthiaca* J. B. Jack ex Lindb. var. *massalongoi* Müll. Frib. **RE**
- Scapania compacta* (A. Roth) Dumort. **DD-va**
- Scapania curta* (Mart.) Dumort. **LC**
- Scapania cuspiduligera* (Nees) Müll. Frib. **EN** [B2ab(iii); C2a(ii)]
- Scapania gymnostomophila* Kaal. **EN** [B2ab(iii); C2a(i); D]
- Scapania helvetica* Gottsche **CR** [B2ab(iii,v); C2a(i)]
- Scapania irrigua* (Nees) Nees **LC**
- Scapania lingulata* H. Buch **DD** – Only one recent locality but others expected in undercollected areas.
- Scapania mucronata* H. Buch **LC-att**
- Scapania nemorea* (L.) Grolle **LC**
- Scapania paludicola* Loeske et Müll. Frib. **VU** [B2ab(iii); C2a(i)]
- Scapania paludosa* (Müll. Frib.) Müll. Frib. **VU** [B2ab(iii); C2a(i)]
- Scapania parvifolia* Warnst. **CR** [B1ab(iii,iv,v)+2ab(iii,iv,v); C2a(ii)]
- Scapania praetervisa* Meyl. **VU** [C2a(i); D2]
- Scapania scandica* (Arnell et H. Buch) Macvicar **DD** – Due to the impossible recognition of sterile material with respect to *S. mucronata* the current distribution and/or threat is unknown. Higher potential threat is supposed for this species than for the similar *S. mucronata*.
- Scapania subalpina* (Nees ex Lindenb.) Dumort. **LR-nt** [C2a(i); D2]
- Scapania uliginosa* (Sw. ex Lindenb.) Dumort. **LC**
- Scapania umbrosa* (Schrad.) Dumort. **LC**
- Scapania undulata* (L.) Dumort. **LC**
- Targionia hypophylla* L. **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i,ii); D]
- Tetralophozia setiformis* (Ehrh.) Schljakov **VU** [D2]
- Trichocolea tomentella* (Ehrh.) Dumort. **LR-nt** [B2ab(iii,iv,v); C2a(i)]
- Tritomaria exsecta* (Schmidel.) Schiffn. ex Loeske **LC-att**
- Tritomaria exsectiformis* (Breidl.) Schiffn. ex Loeske **LC-att**
- Tritomaria quinquentata* (Huds.) H. Buch **LC**

## Mosses

- Acaulon muticum* ([Schreb. ex] Hedw.) Müll. Hal. **VU** [C2a(i)]
- Acaulon triquetrum* (Spruce) Müll. Hal. **VU** [B2ab(iii); C2a(i)]
- Aloina aloides* (Schultz) Kindb. var. *aloides* **DD-va**
- Aloina aloides* var. *ambigua* (Bruch et Schimp.) E. J. Craig **EN** [B2ab(iii); C2a(i)]
- Aloina brevirostris* (Hook. et Grev.) Kindb. **DD-va**
- Aloina obliquifolia* (Müll. Hal.) Broth. (*A. rigida* var. *mucronulata* (Bruch et Schimp.) Limpr.) **LC**
- Aloina rigida* (Hedw.) Limpr. **LC**
- Amblyodon dealbatus* (Hedw.) P. Beauv. **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i,ii); D]
- Amblystegium fluviatile* (Hedw.) Schimp. **LC**
- Amblystegium humile* (P. Beauv.) Crundw. **LC-att**
- Amblystegium radicale* (P. Beauv.) Schimp. (*A. saxatile* Schimp.) **LC-att**
- Amblystegium serpens* (Hedw.) Schimp. **LC**
- Amblystegium tenax* (Hedw.) C. E. O. Jensen **LC-att**

- Amblystegium varium* (Hedw.) Lindb. **LC**  
*Amphidium lapponicum* (Hedw.) Schimp. **VU** [C2a(i); D2]  
*Amphidium mougeotii* (Bruch et Schimp.) Schimp. **LC**  
*Anacamptodon splachnoides* (Brid.) Brid. **EN** [B2ab(iii)]  
*Andreaea crassinervia* Bruch **VU** [D2]  
*Andreaea frigida* Huebener **CR** [B1ab(iii,v)+2ab(iii,v); C2a(ii)]  
*Andreaea rothii* F. Weber et D. Mohr subsp. *rothii* **VU** [C2a(i)]  
*Andreaea rothii* subsp. *falcata* (Schimp.) Lindb. **LC**  
*Andreaea rupestris* Hedw. **LC**  
*Anoetangium aestivum* (Hedw.) Mitt. **VU** [C2a(i); D2]  
*Anomobryum julaceum* (Schrad. ex P. Gaertn., B. Mey. et Scherb.) Schimp. **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i,ii); D] – Probably only in var. *concinatum* (Spruce) J. E. Zetterst.  
*Anomodon attenuatus* (Hedw.) Huebener **LC**  
*Anomodon longifolius* (Schleich. ex Brid.) Hartm. **LC-att**  
*Anomodon rostratus* (Hedw.) Schimp. **DD-va**  
*Anomodon rugelii* (Müll. Hal.) Keissl. **VU** [B2ab(iii); C2a(i)]  
*Anomodon viticulosus* (Hedw.) Hook. et Taylor **LC**  
*Antitrichia curtipendula* (Hedw.) Brid. **LC-att**  
*Archidium alternifolium* (Hedw.) Schimp. **DD** – Only one recent find in South Bohemia, at an unthreatened locality. The assessment of risk is quite difficult due to the ephemeral nature of occurrence. Further finds in undercollected areas are expected but still the species is probably very rare and likely to be listed in one of the threatened categories.  
*Arctoa fulvella* (Dicks.) Bruch et Schimp. **RE**  
*Atrichum angustatum* (Brid.) Bruch et Schimp. **DD** – Two recent localities, the habitats do not seem to be threatened at present, but an accurate assessment of possible risks is not possible. Further finds in poorly explored lowland regions are expected.  
*Atrichum tenellum* (Röhl) Bruch et Schimp. **LC-att**  
*Atrichum undulatum* (Hedw.) P. Beauv. var. *undulatum* **LC**  
*Atrichum undulatum* var. *gracilisetum* Besch. **DD** – Only one recent locality but further occurrences expected in poorly explored lowland regions.  
*Aulacomnium androgynum* (Hedw.) Schwägr. **LC**  
*Aulacomnium palustre* (Hedw.) Schwägr. **LC**  
*Barbula convoluta* Hedw. **LC**  
*Barbula crocea* (Brid.) F. Weber et D. Mohr **DD-va**  
*Barbula enderesii* Garov. **RE**  
*Barbula unguiculata* Hedw. **LC**  
*Bartramia halleriana* Hedw. **LC-att**  
*Bartramia ithyphylla* Brid. **LC**  
*Bartramia pomiformis* Hedw. **LC**  
*Blindia acuta* (Hedw.) Bruch et Schimp. **LC**  
*Brachydontium trichodes* (F. Weber) Milde **LC-att**  
*Brachythecium albicans* (Hedw.) Schimp. **LC**  
*Brachythecium campestre* (Müll. Hal.) Schimp. **DD** – Poorly known taxon with less than five recent records, distribution and possible risks therefore unknown.  
*Brachythecium capillaceum* (F. Weber et D. Mohr) Giacom. **DD-va**  
*Brachythecium geheebii* Milde **EN** [B2ab(iii); C2a(i)]  
*Brachythecium glareosum* (Bruch ex Spruce) Schimp. **LC**  
*Brachythecium laetum* (Brid.) Schimp. **DD** – The same applies as to *B. campestre*.  
*Brachythecium mildeanum* (Schimp.) Schimp. ex Milde **LC-att**  
*Brachythecium oedipodium* (Mitt.) A. Jaeger **LC-att**  
*Brachythecium plumosum* (Hedw.) Schimp. **LC**  
*Brachythecium populeum* (Hedw.) Schimp. **LC**  
*Brachythecium reflexum* (Starke) Schimp. **LC**  
*Brachythecium rivulare* Schimp. **LC**  
*Brachythecium rutabulum* (Hedw.) Schimp. **LC**  
*Brachythecium salebrosum* (F. Weber et D. Mohr) Schimp. **LC**  
*Brachythecium starkei* (Brid.) Schimp. **LC-att**

- Brachythecium velutinum* (Hedw.) Schimp. **LC**  
*Bryoerythrophyllum ferruginascens* (Stirt.) Giacom. **VU** [C2a(i); D2]  
*Bryoerythrophyllum recurvirostrum* (Hedw.) P. C. Chen **LC**  
*Bryum algovicum* Sendtn. ex Müll. Hal. **DD-va**  
*Bryum alpinum* Huds. ex With. **LR-nt** [B2ab(iii); C2a(i)]  
*Bryum argenteum* Hedw. **LC**  
*Bryum bicolor* Dicks. **LC**  
*Bryum binum* (Schreb.) Turner **LC**  
*Bryum caespiticium* Hedw. **LC**  
*Bryum capillare* Hedw. **LC**  
*Bryum creberrimum* Taylor **DD** – Poorly known taxon, with one recent locality (secondary occurrence on a wall). It might be undercollected due to the perceived difficulties of *Bryaceae* identification, but definitely not common.  
*Bryum cyclophyllum* (Schwägr.) Bruch et Schimp. **CR** [B1ab(iv,v)c(iii,v)+2ab(iv,v)c(iii,v)]  
*Bryum elegans* Nees ex Brid. **LC-att** – Our treatment includes *B. stirtonii* Schimp. (see below).  
*Bryum funckii* Schwägr. **DD** – The same applies as to *B. creberrimum*, probably without a recent record.  
*Bryum imbricatum* (Schwägr.) Bruch et Schimp. **DD** – The same applies as to *B. creberrimum*, also only one (but natural) recent locality.  
*Bryum intermedium* (Brid.) Blandow **DD** – Lowland species of poorly explored regions in our country, probably no recent locality known.  
*Bryum klinggraeffii* Schimp. **LC**  
*Bryum laevifilum* Syed (*B. subelegans* auct., *B. flaccidum* auct.) **LC**  
*Bryum longisetum* Blandow ex Schwägr. **RE**  
*Bryum mildeanum* Jur. **DD** – Poorly known species with one recent locality with very limited population. With respect to the historical data and ‘unattractiveness’ of the taxon further extant localities expected.  
*Bryum muehlenbeckii* Bruch et Schimp. **LC-att**  
*Bryum neodamense* Itzigs. **RE**  
*Bryum pallens* Sw. **LC**  
*Bryum pallescens* Schleich. ex Schwägr. **LC**  
*Bryum pseudotriquetrum* (Hedw.) P. Gaertn., B. Mey. et Scherb. **LC**  
*Bryum radiculosum* Brid. **LC**  
*Bryum rubens* Mitt. **LC**  
*Bryum ruderale* Crundw. et Nyholm **DD** – One of the less common species of the gemmiferous *Bryum erythrocarpum* group. No threat is assumed but very few recent records are known.  
*Bryum sauteri* Bruch et Schimp. **DD** – The same applies as to the preceding species.  
*Bryum schleicheri* Schwägr. **CR** [B1ab(iii)+2ab(iii)]  
*Bryum subapiculatum* Hampe **LC**  
*Bryum tenuisetum* Limpr. **DD** – The same applies as to *B. ruderale* and *B. sauteri*.  
*Bryum torquescens* Bruch et Schimp. **DD** – Recorded recently only once but due to the occurrence in poorly surveyed lowland regions further finds expected.  
*Bryum turbinatum* (Hedw.) Turner **EN** [B1ab(iii,v)+2ab(iii,v)]  
*Bryum uliginosum* (Brid.) Bruch et Schimp. **EN** [B2ab(iii); C2a(i)]  
*Bryum violaceum* Crundw. et Nyholm **LC** – This rather common species of the *Bryum erythrocarpum* complex was surprisingly not published from our territory prior to issuing the last checklist (Váňa 1997). First mentioned by Němcová (2000) and Hradílek (2000).  
*Bryum weigelii* Spreng. **LC-att**  
*Buxbaumia aphylla* Hedw. **VU** [C2a(i)]  
*Buxbaumia viridis* (Moug. ex Lam. et DC.) Brid. ex Moug. et Nestl. **EN** [C2a(i)]  
*Callicladium haldanianum* (Grev.) H. A. Crum **VU** [B2ab(iii); C2a(i)]  
*Calliargon cordifolium* (Hedw.) Kindb. **LC**  
*Calliargon giganteum* (Schimp.) Kindb. **VU** [B2ab(iii,iv,v); C2a(i)]  
*Calliargon megalophyllum* Mikut. (*C. moldavicum* (Velen.) Podp.) **RE** – The nomenclature follows the proposal by Hedenäs et al. (1999).  
*Calliargonella cuspidata* (Hedw.) Loeske **LC**  
*Calliargonella lindbergii* (Mitt.) Hedenäs (*Hypnum lindbergii* Mitt.) **LC**  
*Campyliadelphus chrysophyllus* (Brid.) Kanda **LC**  
*Campyliadelphus elodes* (Lindb.) Kanda **DD-va**  
*Campylium protensum* (Brid.) Kindb. **LC**

- Campyllum stellatum* (Hedw.) J. Lange et C. E. O. Jensen **LR-nt** [B2ab(iii)]
- Campylophyllum calcareum* (Crundw. et Nyholm) Hedenäs **DD** – Several (ca. 5) recent localities in the warmer regions on limestone. No obvious threat observed and the localities mostly in undercollected areas, therefore the number probably underestimated and the category **VU** or **LR-nt** (D) would be unjustified.
- Campylophyllum halleri* (Hedw.) M. Fleisch. **VU** [C2a(i); D2]
- Campylophyllum sommerfeltii* (Myr.) Hedenäs **EN** [B2ab(iii); C2a(i)] – Found recently several times at the same sites and in similar conditions as *Lescurea mutabilis* (q.v.). The historical occurrence is less documented than in the case of *L. m.* but this might be caused rather by the non-recognition of the species in the past.
- Campylopus flexuosus* (Hedw.) Brid. **LC**
- Campylopus fragilis* (Brid.) Bruch et Schimp. **LC-att** – This taxon is distributed exclusively in recently undercollected sandstone regions, less than ten recent localities known, without any obvious threat. The situation should be monitored in the future.
- Campylopus introflexus* (Hedw.) Brid. **LC**
- Campylopus pyriformis* (F. W. Schultz) Brid. **DD** – Discovered new for the territory during the partial revision of *Campylopus*. Two recent localities in SE Bohemia and one at a nearby site in SW Moravia from 1960s. Further finds are however expected.
- Campylopus subulatus* Schimp. **DD-va**
- Campylostelium saxicola* (F. Weber et D. Mohr) Bruch et Schimp. **LR-nt** [C2a(i)]
- Ceratodon purpureus* (Hedw.) Brid. **LC**
- Cinclidotus aquaticus* (Hedw.) Bruch et Schimp. **RE**
- Cinclidotus fontinaloides* (Hedw.) P. Beauv. **CR** [B1ab(iii,v)+2ab(iii,v)]
- Cinclidotus riparius* (Host ex Brid.) Arn. **CR** [B1ab(iii,v)+2ab(iii,v)]
- Cirriphyllum piliferum* (Hedw.) Grout **LC**
- Cirriphyllum tommasinii* (Sendt. ex Boul.) Grout **LC**
- Cleistocarpidium palustre* (Bruch et Schimp.) Ochyra et Bednarek-Ochyra (*Pleuridium palustre* (Bruch et Schimp.) Bruch et Schimp.) **VU** [C2a(i)]
- Climacium dendroides* (Hedw.) F. Weber et D. Mohr **LC**
- Conardia compacta* (Müll. Hal.) H. Rob. **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i); D]
- Coscinodon cribrosus* (Hedw.) Spruce **LC**
- Cratoneuron filicinum* (Hedw.) Spruce **LC**
- Crossidium squamiferum* (Viv.) Jur. **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i)]
- Ctenidium molluscum* (Hedw.) Mitt. **LC**
- Cynodontium bruntonii* (Sm.) Bruch et Schimp. **LC-att**
- Cynodontium gracilescens* (F. Weber et D. Mohr) Schimp. **VU** [C2a(i); D2]
- Cynodontium polycarpon* (Hedw.) Schimp. **LC**
- Cynodontium strumiferum* (Hedw.) Lindb. **LC**
- Cynodontium tenellum* (Schimp.) Limpr. **DD** – The majority of historical records, as in *Campylopus pyriformis*, comes from recently under-collected sandstone regions. Only two recent finds, threat not possible to assess at present.
- Dichelyma falcatum* (Hedw.) Myrin **DD-va**
- Dichodontium palustre* (Dicks.) M. Stech (*Dicranella palustris* (Dicks.) Crundw.) **LC**
- Dichodontium pellucidum* (Hedw.) Schimp. **LC**
- Dicranella cerviculata* (Hedw.) Schimp. **LC**
- Dicranella crispa* (Hedw.) Schimp. **DD-va**
- Dicranella heteromalla* (Hedw.) Schimp. **LC**
- Dicranella humilis* R. Ruthe **DD-va**
- Dicranella rufescens* (With.) Schimp. **LC**
- Dicranella schreberiana* (Hedw.) Hilf. ex H. A. Crum et L. E. Anderson **LC**
- Dicranella staphylina* H. Whitehouse **LC**
- Dicranella subulata* (Hedw.) Schimp. **EN** [B2ab(iii,iv,v); C2a(i)]
- Dicranella varia* (Hedw.) Schimp. **LC**
- Dicranodontium asperulum* (Mitt.) Broth. **LC-att**
- Dicranodontium denudatum* (Brid.) E. Britton **LC**
- Dicranodontium uncinatum* (Harv.) A. Jaeger **EN** [B2ab(iii); C2a(i)]
- Dicranoweisia cirrata* (Hedw.) Lindb. **LC**
- Dicranoweisia crispula* (Hedw.) Milde **LC**
- Dicranum bonjeanii* De Not. **LR-nt** [B2ab(iii)]

*Dicranum elongatum* Schleich. ex Schwägr. **EN** [B1ab(iii,iv,v)+2ab(iii,iv,v)] – The situation in this taxon has been a matter of confusion in the past due to the unclear concept and type of *Dicranum sendtneri* Limpr. Quite recently, Th.-B. Engelmark revised two isotypes of *D. sendtneri* and showed that they represented a mixture of *D. elongatum* and *D. fuscescens* (L. Hedenäs in litt.). The concept of Franklová (1994, 1999), which was accepted by Váňa (1997), argued for maintaining *D. sendtneri* as a taxon close or infraspecific to *D. elongatum*, placing all plants growing in the sandstone regions of North and East Bohemia under *D. s.* Several occurrences in the ADRŠpašsko-teplické skály sandstone region are the only recent ones in the country.

*Dicranum flagellare* Hedw. **LC-att**

*Dicranum flexicaule* Brid. **LC** – The majority of our historical reports of *D. congestum* Brid. including the distribution of the taxon charted by Franklová (1994) belongs here, not to *D. fuscescens*, where it should belong according to the type.

*Dicranum fulvum* Hook. **LC-att**

*Dicranum fuscescens* Turner (*D. congestum* Brid.) **LC**

*Dicranum majus* Turner **EN** [B2ab(iii); C2a(i)]

*Dicranum montanum* Hedw. **LC**

*Dicranum muehlenbeckii* Bruch et Schimp. **EN** [B2ab(iii,iv,v); C2a(i)]

*Dicranum polysetum* Sw. **LC**

*Dicranum scoparium* Hedw. **LC**

*Dicranum spadiceum* J. E. Zetterst. **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i,ii); D]

*Dicranum spurium* Hedw. **LC**

*Dicranum tauricum* Sapjegin **LC**

*Dicranum undulatum* Schrad. ex Brid. (*D. bergeri* Blandow) **LC**

*Dicranum viride* (Sull. et Lesq.) Lindb. **CR** [B1ab(iii)+2ab(iii)]

*Didymodon acutus* (Brid.) K. Saito **LR-nt** [C2a(i)]

*Didymodon australasiae* var. *umbrosus* (Müll. Hal.) R. H. Zander **LC** – Discovered new for the territory in 1997 (Kučera 1999).

*Didymodon cordatus* Jur. **VU** [B2ab(iii); C2a(i)]

*Didymodon fallax* (Hedw.) R. H. Zander **LC**

*Didymodon ferrugineus* (Schimp. ex Besch.) M. O. Hill **LC**

*Didymodon glaucus* Ryan **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i)]

*Didymodon insulanus* (De Not.) M. O. Hill **LC**

*Didymodon luridus* Hornsch. **LR-nt** [C2a(i); D2]

*Didymodon rigidulus* Hedw. var. *rigidulus* (*Didymodon mamillosus* (Crundw.) M. O. Hill) **LC** – *Didymodon mamillosus* was reported new to our territory by Soldán (2000). However, this taxon is regarded to be synonymous with *D. rigidulus* by Kučera (2000).

*Didymodon rigidulus* var. *validus* (Limpr.) Düll **DD-va**

*Didymodon sinuosus* (Mitt.) Delogne **EN** [B2ab(iii); C2a(i)]

*Didymodon spadiceus* (Mitt.) Limpr. **DD** – Only very few recent records; the situation is complicated by the fact that the usually sterile *D. spadiceus* is not with certainty distinguishable from the common *D. fallax*, moreover *D. s.* grows in undercollected regions.

*Didymodon tophaceus* (Brid.) Lisa **LC**

*Didymodon vinealis* (Brid.) R. H. Zander **DD-va** – The taxon has been evaluated as not threatened in the last Red List (Váňa 1995). The revision of available specimens (Kučera unpubl.) nevertheless showed that nearly all historical specimens present in the herbaria were wrongly identified and mostly belong to *D. insulanus*.

*Diphyscium foliosum* (Hedw.) D. Mohr **LC-att**

*Discelium nudum* (Dicks.) Brid. **CR** [B1ab(iii,v)c(iii,iv)+2ab(iii,v)c(iii,iv)]

*Distichium capillaceum* (Hedw.) Bruch et Schimp. **LC**

*Distichium inclinatum* (Hedw.) Bruch et Schimp. **VU** [C2a(i)]

*Ditrichum flexicaule* (Schwägr.) Hampe **LC-att**

*Ditrichum gracile* (Mitt.) Kuntze **LC**

*Ditrichum heteromallum* (Hedw.) E. Britton **LC**

*Ditrichum lineare* (Sw.) Lindb. **LC-att**

*Ditrichum pallidum* (Hedw.) Hampe **DD** – Only one recent record but probably under-recorded due to the occurrence in poorly surveyed regions.

*Ditrichum pusillum* (Hedw.) Hampe **LC-att**

*Ditrichum zonatum* (Brid.) Kindb. **EN** [B2ab(iii); C2a(i); D]

*Drepanocladus aduncus* (Hedw.) Warnst. **LC**

- Drepanocladus longifolius* (Mitt.) Paris **DD-va**  
*Drepanocladus polycarpus* (Blandow ex Voit) Warnst. **LC** – The reasons for distinguishing the taxon at the specific level have been summarized by Žarnowiec (2001).  
*Drepanocladus polygamus* (Schimp.) Hedenäs **LR-nt** [B2ab(iii); C2a(i)]  
*Drepanocladus sendtneri* (Schimp. ex H. Müll.) Warnst. **DD-va**  
*Drepanocladus sordidus* (Müll. Hal.) Hedenäs **RE**  
*Encalypta affinis* R. Hedw. **DD-va**  
*Encalypta ciliata* Hedw. **LR-nt** [C2a(i)]  
*Encalypta rhamnoides* Schwägr. **EN** [B1ab(iii)+2ab(iii); C2a(i); D]  
*Encalypta spathulata* Müll. Hal. **DD-va** – A specimen from Mt Kotel named as *E. rhamnoides* in herb. Pilous seems to belong to this species (the peristome is absent but see the note below *E. trachymitria*. Rev. Pilous in sched., teste Váňa).  
*Encalypta streptocarpa* Hedw. **LC**  
*Encalypta trachymitria* Ripart **DD** – Reported previously as *E. rhamnoides* var. *leptodon* Bruch ex Lindb. (i.e. *E. trachymitria* – cf. Mogensen 2001) from the Hrubý Jeseník Mts (Podpěra 1906). We have been able to confirm recently only *E. rhamnoides* at this locality, whereas plants corresponding to *E. t.* were recently found at the historical locality of *E. spathulata* (Mt Kotel). As both taxa seem to differ only in the degree of peristome development (absent in *E. s.* vs. reduced one in *E. t.*) and have never have been evaluated at the same time, we have reservations about the specific status of both taxa.  
*Encalypta vulgaris* Hedw. **LC**  
*Entodon concinnus* (De Not.) Paris **LC**  
*Entodon schleicheri* (Schimp.) Demet. **CR** [B1ab(iii,iv)+2ab(iii,iv); C2a(i,ii)]  
*Entosthodon fascicularis* (Hedw.) Müll. Hal. **DD** – Probably quite rare species (three recent records) but growing in little surveyed regions or habitats. The populations might be strongly fluctuating.  
*Ephemerum cohaerens* (Hedw.) Hampe **DD-va**  
*Ephemerum minutissimum* Lindb. **LC**  
*Ephemerum recurvifolium* (Dicks.) Boulay **LC**  
*Ephemerum serratum* (Hedw.) Hampe **DD** – Following the separation of *E. minutissimum*, this seems to be the rarer taxon of the two but no realistic assessment of the rarity and/or threat could be made.  
*Eucladium verticillatum* (Brid.) Bruch et Schimp. **LC-att**  
*Eurhynchium angustirete* (Broth.) T. J. Kop. **LC**  
*Eurhynchium crassinervium* (Wilson) Schimp. **LC**  
*Eurhynchium flotowianum* (Sendtn.) Kartt. **DD** – Rather poorly known species with between 5 and 10 recent localities, mainly in the Český kras karst region. Assessment of the possible risks could not be made.  
*Eurhynchium hians* (Hedw.) Sande Lac. **LC**  
*Eurhynchium praelongum* (Hedw.) Schimp. **LC**  
*Eurhynchium pulchellum* (Hedw.) Jenn. **DD** – About 5 recent localities without an obvious threat. With respect to the historical situation, further finds are expected.  
*Eurhynchium pumilum* (Wilson) Schimp. **DD** – One recent find in the Prague botanical garden, made shortly after the strong doubts regarding the historical occurrence in our territory had been published (annotation 89 in Váňa 1998).  
*Eurhynchium schleicheri* (Hedw. f.) Jur. **LC-att**  
*Eurhynchium speciosum* (Brid.) Jur. **LC-att**  
*Eurhynchium striatulum* (Spruce) Schimp. **LR-nt** [C2a(i)]  
*Eurhynchium striatum* (Hedw.) Schimp. **LC-att**  
*Fissidens adiantoides* Hedw. **LC-att**  
*Fissidens arnoldii* R. Ruthe **EN** [B1ab(iii,iv)+2ab(iii,iv)]  
*Fissidens bambergi* Milde **EN** [B2ab(iii); C2a(i); D] – Newly recognized taxon, based on the treatment by Hradílek (2002a).  
*Fissidens bryoides* Hedw. **LC**  
*Fissidens crassipes* Wilson ex Bruch et Schimp. **DD-va**  
*Fissidens dubius* P. Beauv. var. *dubius* **LC**  
*Fissidens dubius* var. *mucronatus* (Breidl. ex Limpr.) Kartt., Hedenäs et L. Söderstr. **LC**  
*Fissidens exilis* Hedw. **LC**  
*Fissidens gracilifolius* Brugg.-Nann. et Nyholm **LC**  
*Fissidens gymnanthus* Buse **LC-att**

- Fissidens incurvus* Starke ex Röhl **LR-nt** [C2a(i)] – The taxon is difficult to delimit against *F. viridulus* (cf. Hradílek 2002a).
- Fissidens limbatus* Sull. **EN** [B2ab(iii)]
- Fissidens osmundoides* Hedw. **LC-att**
- Fissidens pusillus* (Wilson) Milde **LC-att**
- Fissidens rufulus* Bruch et Schimp. **LR-nt** [B2ab(iii); C2a(i)]
- Fissidens taxifolius* Hedw. **LC**
- Fissidens viridulus* (Sw.) Wahlenb. **LC**
- Fontinalis antipyretica* Hedw. **LC**
- Fontinalis hypnoides* Hartm. **DD** – Found recently twice in South Bohemia, never in large quantity. However, the biotope in general has not been adequately surveyed and in addition, we have encountered difficulties concerning the delimitation against *F. antipyretica*.
- Fontinalis squamosa* Hedw. **LC**
- Funaria hygrometrica* Hedw. **LC**
- Funaria muehlenbergii* Turner **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i)]
- Grimmia alpestris* (F. Weber et D. Mohr) Schleich. **VU** [D2]
- Grimmia anodon* Bruch et Schimp. **EN** [B2ab(iii); C2a(i)]
- Grimmia anomala* Hampe ex Schimp. **VU** [D2]
- Grimmia atrata* Miel. ex Hornsch. **VU** [D2]
- Grimmia caespiticia* (Brid.) Jur. **DD** – The situation regarding this species is quite obscure. It was recorded from Velká kotlina cirque in the Hrubý Jeseník Mts. The corresponding specimens by Limpricht (coll. 1870), and later by Pokluda (coll. 1964) were revised and *probably* belong to this species – unfortunately they are sterile and the hair-point is distinctly longer than in typical specimens. Otherwise the gametophytic characters are matching but even Muñoz (1998) admits that sterile *Grimmia caespiticia* may be at times impossible to distinguish from *G. alpestris* and *Coscinodon cribrosus*. During a recent survey, sterile plants, transitional in their characters between *G. c.* and *G. a.* were again found in Velká kotlina, together with typical fertile *G. alpestris*.
- Grimmia crinita* Brid. **EN** [B1ab(iii,v)+2ab(iii,v); C2a(ii)]
- Grimmia donniana* Sm. **LC**
- Grimmia elatior* Bruch ex Bals.-Criv. et De Not. **DD-va**
- Grimmia elongata* Kaulf. **LR-nt** [D2]
- Grimmia funalis* (Schwägr.) Bruch et Schimp. **LC-att**
- Grimmia hartmanii* Schimp. **LC**
- Grimmia incurva* Schwägr. **LC**
- Grimmia laevigata* (Brid.) Brid. **LC**
- Grimmia longirostris* Hook. (*G. affinis* Hornsch.) **LC**
- Grimmia montana* Bruch et Schimp. **LR-nt** [C2a(i)]
- Grimmia muehlenbeckii* Schimp. **LC** – Regarded as a distinct species by Greven (1995); this view is mostly accepted by subsequent treatments.
- Grimmia orbicularis* Bruch **LC**
- Grimmia ovalis* (Hedw.) Lindb. **LC**
- Grimmia plagiopodia* Hedw. **DD-va**
- Grimmia pulvinata* (Hedw.) Sm. **LC**
- Grimmia ramondii* (Lam. et DC.) Margad. (*G. curvata* (Brid.) De Sloover, *Dryptodon patens* (Hedw.) Brid.) **LC-att**
- Grimmia sessitana* De Not. **VU** [D2] – Historical records have been omitted in previous version of checklist (Váňa 1997); the revision and new records have been summarized by Buryová & Kučera (1999). The taxon has been synonymized with *G. reflexidens* Müll. Hal. by Muñoz (1998) but Maier (2002) recently argued that the two types were not identical and advocated the earlier used name *G. sessitana*.
- Grimmia terebinervis* Limpr. **CR** [C2a(ii); D] – Newly reported from the territory by Kučera et al. (2001).
- Grimmia tergestina* Tomm. ex Bruch et Schimp. **LC-att**
- Grimmia torquata* Hook. ex Drumm. **VU** [D2]
- Grimmia trichophylla* Grev. **LR-nt** [C2a(i)]
- Grimmia unicolor* Hook. **RE**
- Gymnostomum aeruginosum* Sm. **LC**
- Gymnostomum calcareum* Nees et Hornsch. **DD-va**
- Gymnostomum viridulum* Brid. **VU** [C2a(i)]
- Gyroweisia tenuis* ([Schrad. ex] Hedw.) Schimp. **DD** – There are only very few recent records but according to the published distribution (Pospíšil 1983) many more records can be expected in under-worked regions.

- Hamatocaulis vernicosus* (Mitt.) Hedenäs **VU** [C2a(i)]
- Hedwigia ciliata* (Hedw.) P. Beauv. **LC**
- Hedwigia stellata* Hedenäs **DD** – Despite a focused survey in some regions of our country, no additional locality could be found to the recent published one. Nonetheless, the evaluation of this newly recognized taxon in one of the high-risk categories would be premature.
- Helodinium blandowii* (F. Weber et D. Mohr) Warnst. **EN** [B2ab(iii); C2a(ii)]
- Hennediella heimii* (Hedw.) R. H. Zander **DD-va**
- Herzogiella seligeri* (Brid.) Z. Iwats. **LC**
- Herzogiella striatella* (Brid.) Z. Iwats. **LR-nt** [C2a(i); D2]
- Heterocladium dimorphum* (Brid.) Schimp. **VU** [B1ab(iv,v)+2ab(iv,v); C2a(i)]
- Heterocladium heteropterum* (Bruch ex Schwäger.) Schimp. **LC**
- Hilpertia velenovskyi* (Schiffn.) R. H. Zander **VU** [B1ab(iii,iv,v)+2ab(iii,iv,v); C2a(i)]
- Homalia trichomanoides* (Hedw.) Schimp. **LC**
- Homalothecium lutescens* (Hedw.) H. Rob. **LC**
- Homalothecium philippeanum* (Spruce) Schimp. **DD** – Following the revision by Hofmann (1998), partial revision of the species was made (Voříšková pers. comm.), which confirmed a high number of misidentifications for the commoner *H. lutescens*. Also, the number of recent finds of *H. p.* is quite low, which indicates the need for focused survey in order to assess the recent distribution and possible threats.
- Homalothecium sericeum* (Hedw.) Schimp. **LC**
- Homomallium incurvatum* (Brid.) Loeske **LC**
- Hookeria lucens* (Hedw.) Sm. **VU** [C2a(i)]
- Hygrohypnum luridum* (Hedw.) Jenn. **LC-att**
- Hygrohypnum molle* (Hedw.) Loeske **LR-nt** [B2ab(iii)] – some localities, C2a(i) – most localities]
- Hygrohypnum ochraceum* (Turner ex Wilson) Loeske **LC**
- Hygrohypnum smithii* (Sw.) Broth. **RE**
- Hylocomium brevirostre* (Brid.) Schimp. **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i,ii); D]
- Hylocomium pyrenaicum* (Spruce) Lindb. **VU** [B2ab(iii,iv); C2a(i)]
- Hylocomium splendens* (Hedw.) Schimp. **LC**
- Hylocomium umbratum* (Hedw.) Schimp. **LC-att**
- Hymenostylium recurvirostrum* (Hedw.) Dixon **LR-nt** [D2]
- Hypnum andoi* A. J. E. Sm. (*H. mammillatum* (Brid.) Loeske) **LC**
- Hypnum callichroum* Brid. **EN** [B1ab(iii,iv,v)+2ab(iii,iv,v); C2a(i)]
- Hypnum cupressiforme* Hedw. var. *cupressiforme* **LC**
- Hypnum cupressiforme* var. *filiforme* Brid. **LC**
- Hypnum cupressiforme* var. *julaceum* Brid. **DD** – Very poorly known taxon of the *Hypnum cupressiforme* complex, found recently only at one locality. The assessment of the threat is not possible at present.
- Hypnum cupressiforme* var. *lacunosum* Brid. **LC**
- Hypnum cupressiforme* var. *subjulaceum* Molendo **DD** – Rather common occurrence of this poorly known taxon has recently been documented only from the Velká kotlina cirque in the Hrubý Jeseník Mts. The distribution is otherwise unknown.
- Hypnum fertile* Sendtn. **DD-va**
- Hypnum imponens* Hedw. **DD-va** – Reinstated after the exclusion by Váňa 1997 following the revision of the herbarium material by Z. Hradílek (Hradílek 2002b).
- Hypnum jutlandicum* Holmen et Warncke **LC**
- Hypnum pallescens* (Hedw.) P. Beauv. **LC-att**
- Hypnum pratense* (Rabenh.) W. Koch ex Hartm. **LR-nt** [C2a(i)]
- Hypnum recurvatum* (Lindb. et Arnell) Kindb. **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i,ii); D] – The historical specimen, identified during the Ando's revision (Ando 1976), was omitted by Váňa 1997. Recently the species has also been collected in the Krkonoše Mts (Kučera et al. 2003).
- Hypnum revolutum* (Mitt.) Lindb. **RE** – Only in var. *dolomiticum* (Milde) Mönk.
- Hypnum sauteri* Schimp. **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i,ii); D] – Newly discovered for our territory in the recent specimen of *H. recurvatum* (Kučera et al. 2003).
- Hypnum vaucheri* Lesq. **LC-att**
- Isoterygiopsis muelleriana* (Schimp.) Z. Iwats. **CR** [B1ab(iii,iv,v)+2ab(iii,iv,v); C2a(i)] – Newly discovered in the Czech Republic (Blockeel et al. 2003). Previous information about the occurrence of this arctic-alpine species in our country (Moravian thermophyticum) was based on an improbable literature record (cf. annotation 31, Váňa 1998).

- Isopterygiopsis pulchella* (Hedw.) Z. Iwats. **CR** [B1ab(iii,iv,v)+2ab(iii,iv,v); C2a(i)]
- Isothecium alopecuroides* (Dubois) Isov. **LC**
- Isothecium myosuroides* Brid. **LC-att**
- Kiaeria blyttii* (Bruch et Schimp.) Broth. **LC**
- Kiaeria falcata* (Hedw.) I. Hagen **CR** [C2a(i)]
- Kiaeria glacialis* (Berggr.) I. Hagen **DD-va**
- Kiaeria starkei* (F. Weber et D. Mohr) I. Hagen **LC**
- Leptobryum pyriforme* (Hedw.) Wilson **LC**
- Leptodictyum riparium* (Hedw.) Warnst. (*Amblystegium riparium* (Hedw.) Schimp.) **LC**
- Lescuraea incurvata* (Hedw.) E. Lawton **LC**
- Lescuraea mutabilis* (Brid.) Lindb. ex I. Hagen **EN** [B2ab(iii); C2a(i)] – Found recently several times in not very large turfs at the sites. The species has obviously rapidly retreated in the past but nothing is known about when the decline began and if it has ceased. The suitable habitats for the occurrence of the species have not been well investigated recently.
- Lescuraea patens* Lindb. **CR** [C2a(i)] – Newly discovered taxon (Kučera et al. 2003).
- Lescuraea radicata* (Mitt.) Mönk. **DD-va**
- Lescuraea saxicola* (Schimp.) Molendo **DD-va** – From all historical records, only one collected by Podpěra at Mt Šerák (Hrubý Jeseník Mts) in 1905 and another collected by Pilous at the Pančavský waterfall (Krkonoše Mts) are obviously correctly identified. The delimitation of the specimen against *L. mutabilis* is weak and rather intuitive with respect to the saxicolous habitat.
- Leskea polycarpa* Hedw. **LC**
- Leucobryum glaucum* (Hedw.) Ångström **LC**
- Leucobryum juniperoideum* (Brid.) Müll. Hal. **LC**
- Leucodon sciuroides* (Hedw.) Schwägr. **LC**
- Meesia longiseta* Hedw. **RE**
- Meesia triquetra* ([L. ex] Jolycl.) Ångström **CR** [C2a(i); D]
- Meesia uliginosa* Hedw. **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i,ii); D]
- Metaneckera menziesii* (Drumm.) Steere **CR** [C2a(i)] – Discovered new for the territory by Mudrová (2000).
- Microbryum curvicolle* ([Ehrh. ex] Hedw.) R. H. Zander **VU** [B2ab(iii); C2a(i)]
- Microbryum davallianum* (Sm.) R. H. Zander (*Pottia davalliana* (Sm.) C. E. O. Jensen, incl. *Pottia conica* (Schleich. ex Schwägr.) Nyholm) **DD** – Only one recent locality, however no systematic survey in the regions favourable to its occurrence is being made.
- Microbryum floerkeanum* (F. Weber et D. Mohr) Schimp. **DD-va**
- Microbryum starckeanum* (Hedw.) R. H. Zander **DD-va**
- Mielichhoferia mielichhoferiana* (Funck) Loeske **CR** [B1ab(iii)+2ab(iii); C2a(i,ii); D]
- Mnium ambiguum* H. Müll. **VU** [C2a(i)]
- Mnium hornum* Hedw. **LC**
- Mnium marginatum* (Dicks.) P. Beauv. **LC**
- Mnium spinosum* (Voit) Schwägr. **LC**
- Mnium spinulosum* Bruch et Schimp. **LC**
- Mnium stellare* Hedw. **LC**
- Mnium thomsonii* Schimp. **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i); D]
- Myurella julacea* (Schwägr.) Schimp. **EN** [B2ab(iii); C2a(i)]
- Neckera besseri* (Lobazewski) Jur. **LC**
- Neckera complanata* (Hedw.) Huebener **LC**
- Neckera crispa* Hedw. **LC**
- Neckera pennata* Hedw. **EN** [B2ab(iii)]
- Neckera pumila* Hedw. **DD-va**
- Octodiceras fontanum* (Bach. Pyl.) Lindb. **LR-nt** [C2a(i)]
- Oligotrichum hercynicum* (Hedw.) Lam. et DC. **LC**
- Oncophorus wahlenbergii* Brid. **RE**
- Orthodontium lineare* Schwägr. **LC**
- Orthothecium intricatum* (Hartm.) Schimp. **LC**
- Orthothecium rufescens* (Brid.) Schimp. **RE**
- Orthotrichum affine* Brid. **LC**
- Orthotrichum alpestre* Hornsch. ex Bruch et Schimp. **DD-va**
- Orthotrichum anomalum* Hedw. **LC**

- Orthotrichum cupulatum* Brid. var. *cupulatum* **LC-att**  
*Orthotrichum cupulatum* var. *riparium* Huebener **DD-va**  
*Orthotrichum diaphanum* Brid. **LC**  
*Orthotrichum gymnostomum* Bruch ex Brid. **RE**  
*Orthotrichum lyellii* Hook. et Taylor **LC-att**  
*Orthotrichum obtusifolium* Brid. **LC**  
*Orthotrichum pallens* Bruch ex Brid. **LC**  
*Orthotrichum patens* Bruch ex Brid. **EN** [B2ab(iii)]  
*Orthotrichum pumilum* Sw. **LC**  
*Orthotrichum rogeri* Brid. **DD-va**  
*Orthotrichum rupestre* Schleich. ex Schwägr. **LR-nt** [C2a(i)]  
*Orthotrichum scanicum* Grönvall **DD-va**  
*Orthotrichum speciosum* Nees **LC**  
*Orthotrichum stellatum* Brid. **CR** [B1ab(iii)+2ab(iii); C2a(i); D]  
*Orthotrichum stramineum* Hornsch. ex Brid. **LC-att**  
*Orthotrichum striatum* Hedw. **LR-nt** [B2ab(iii); C2a(i)]  
*Orthotrichum urnigerum* Myrin **CR** [B1ab(iii)+2ab(iii); C2a(i,ii); D]  
*Paludella squarrosa* (Hedw.) Brid. **CR** [C2a(i)]  
*Palustriella commutata* (Hedw.) Ochyra **LC**  
*Palustriella decipiens* (De Not.) Ochyra **LR-nt** [C2a(i)]  
*Palustriella falcata* (Brid.) Hedenäs **LC**  
*Paraleucobryum longifolium* ([Ehrh. ex] Hedw.) Loeske **LC**  
*Philonotis caespitosa* Jur. **LC**  
*Philonotis calcarea* (Bruch et Schimp.) Schimp. **LC**  
*Philonotis capillaris* Lindb. ex C. Hartm. (*P. arnellii* Husn.) **EN** [B1ab(iii)+2ab(iii); C2a(i)]  
*Philonotis fontana* (Hedw.) Brid. **LC**  
*Philonotis marchica* (Hedw.) Brid. **DD** – One recent locality (anthropic site), few other will probably emerge but the overall population is definitely small.  
*Philonotis seriata* Mitt. **LC**  
*Philonotis tomentella* Molendo **VU** [C2a(i)] – Included in synonymy with *P. fontana* in Váňa (1997) following the study of Buryová (1996).  
*Physcomitrella patens* (Hedw.) Bruch et Schimp. (*Aphanorrhagma patens* (Hedw.) Lindb.) **LR-nt** [C2a(i)]  
*Physcomitrium euryostomum* Sendtn. **VU** [C2a(i)]  
*Physcomitrium pyriforme* (Hedw.) Brid. **LC**  
*Physcomitrium sphaericum* (C. F. Ludw.) Fühnr. **VU** [C2a(i)]  
*Plagiobryum zierii* (Hedw.) Lindb. **VU** [C2a(i)]  
*Plagiomnium affine* (Blandow) T. J. Kop. **LC**  
*Plagiomnium cuspidatum* (Hedw.) T. J. Kop. **LC**  
*Plagiomnium elatum* (Bruch et Schimp.) T. J. Kop. **LC-att**  
*Plagiomnium ellipticum* (Brid.) T. J. Kop. **LC-att**  
*Plagiomnium medium* (Bruch et Schimp.) T. J. Kop. **LR-nt** [B2ab(iii); C2a(i)]  
*Plagiomnium rostratum* (Schrad.) T. J. Kop. **LC-att**  
*Plagiomnium undulatum* (Hedw.) T. J. Kop. **LC**  
*Plagiopus oederianus* (Sw.) H. A. Crum et L. E. Anderson **EN** [B2ab(iii); C2a(i)]  
*Plagiothecium cavifolium* (Brid.) Z. Iwats. **LC**  
*Plagiothecium curvifolium* Schlieph. ex Limpr. **LC**  
*Plagiothecium denticulatum* (Hedw.) Schimp. var. *denticulatum* **LC**  
*Plagiothecium denticulatum* var. *obtusifolium* (Turner) Moore (*Plagiothecium donnianum* (Sm.) Mitt.) **VU** [C2a(i); D2]  
*Plagiothecium laetum* Schimp. **LC**  
*Plagiothecium latebricola* Schimp. **DD** – The taxon has been found at some 5 or so localities in Moravia, without any obvious threat to the populations (Z. Hradílek in litt.). The distribution pattern is not clear and the search for the taxon should be more intense in the future.  
*Plagiothecium neckeroideum* Schimp. **EN** [B1ab(iii)+2ab(iii); C2a(i)]  
*Plagiothecium nemorale* (Mitt.) A. Jaeger **LC**  
*Plagiothecium platyphyllum* Mönk. **LC-att**  
*Plagiothecium ruthei* Limpr. **LC-att**

- Plagiothecium succulentum* (Wilson) Lindb. **LC**  
*Plagiothecium undulatum* (Hedw.) Schimp. **LC**  
*Platydictya jungermannioides* (Brid.) H. A. Crum **DD-va**  
*Platygyrium repens* (Brid.) Schimp. **LC**  
*Platyhypnidium grolleanum* Ochyra et Bednarek-Ochyra **DD-va** – Newly described taxon from a single locality in the Krkonoše Mts (Ochyra et Bednarek-Ochyra 1999).  
*Platyhypnidium riparioides* (Hedw.) Dixon **LC**  
*Pleuridium acuminatum* Lindb. **LC-att**  
*Pleuridium subulatum* (Hedw.) Rabenh. **LC**  
*Pleurochaete squarrosa* (Brid.) Lindb. **LR-nt** [D2]  
*Pleurozium schreberi* (Brid.) Mitt. **LC**  
*Pogonatum aloides* (Hedw.) P. Beauv. **LC**  
*Pogonatum nanum* (Hedw.) P. Beauv. **DD** – Only four localities known recently, no assessment of the threat could be made.  
*Pogonatum urnigerum* (Hedw.) P. Beauv. **LC**  
*Pohlia andalusica* (Höhn.) Broth. **DD** – One of the rarer gemmiferous *Pohlia* species; no threat for these pioneer species is obvious but too little is known to make final assessment at present.  
*Pohlia annotina* (Hedw.) Lindb. **LC**  
*Pohlia bulbifera* (Warnst.) Warnst. **LC**  
*Pohlia camptotrachela* (Ren. et Card.) Broth. **DD** – The same applies as to *P. andalusica*  
*Pohlia cruda* (Hedw.) Lindb. **LC**  
*Pohlia drummondii* (Müll. Hal.) A. L. Andrews **LC**  
*Pohlia elongata* Hedw. **VU** [C2a(i)]  
*Pohlia filum* (Schimp.) Mårtensson **DD** – The same applies as to *P. andalusica*  
*Pohlia lescuriana* (Sull.) Grout **DD** – Overlooked and poorly known taxon in our territory. Probably only two recent finds but no focused search has been undertaken.  
*Pohlia longicollis* (Hedw.) Lindb. **CR** [C2a(i); D]  
*Pohlia ludwigii* (Spreng. ex Schwägr.) Broth. **VU** [C2a(i); D2]  
*Pohlia lutescens* (Limpr.) Lindb. **DD-va** – A taxon with probably similar distribution and ecology to *P. lescuriana* but completely without recent (and with only one known historical record!) data.  
*Pohlia melanodon* (Brid.) A. J. Shaw **DD** – The same applies as to the preceding species, historically somewhat better documented and with one recent locality.  
*Pohlia nutans* (Hedw.) Lindb. subsp. *nutans* **LC**  
*Pohlia nutans* subsp. *schimperii* (Müll. Hal.) Nyholm **LR-nt** [D2] – Newly discovered taxon (Kučera et al. in prep.).  
*Pohlia obtusifolia* (Vill. ex Brid.) L. F. Koch **DD-va**  
*Pohlia prolifera* (Lindb. ex Breidl.) Lindb. ex Arnell **LC**  
*Pohlia wahlenbergii* (F. Weber et D. Mohr) A. L. Andrews **LC**  
*Polytrichastrum alpinum* (Hedw.) G. L. Sm. (*Polytrichum alpinum* Hedw.) **LC**  
*Polytrichastrum formosum* (Hedw.) G. L. Sm. (*Polytrichum formosum* Hedw.) **LC**  
*Polytrichastrum longisetum* (Sw. ex Brid.) G. L. Sm. (*Polytrichum longisetum* Sw. ex Brid.) **LC**  
*Polytrichastrum pallidisetum* (Funck) G. L. Sm. (*Polytrichum pallidisetum* Funck) **LC-att**  
*Polytrichastrum sexangulare* (Brid.) G. L. Sm. (*Polytrichum sexangulare* Brid.) **RE**  
*Polytrichum commune* Hedw. **LC**  
*Polytrichum juniperinum* Hedw. **LC**  
*Polytrichum perigoniale* Michx. **LC**  
*Polytrichum piliferum* Hedw. **LC**  
*Polytrichum strictum* Brid. **LC**  
*Pseudophemerum nitidum* (Hedw.) Reimers **LC**  
*Pseudobryum cinclidioides* (Huebener) T. J. Kop. **EN** [B2ab(iii); C2a(i)]  
*Pseudo-calliargon lycopodioides* (Brid.) Hedenäs (*Drepanocladus lycopodioides* (Brid.) Warnst.) **DD-va**  
*Pseudo-calliargon trifarium* (F. Weber et D. Mohr) Loeske (*Calliargon trifarium* (F. Weber et D. Mohr) Kindb.) **CR** [B1ab(iii,iv,v)+2ab(iii,iv,v); C2a(i)]  
*Pseudocrossidium hornsuschianum* (Schultz) R. H. Zander **LC**  
*Pseudocrossidium revolutum* (Brid.) R. H. Zander **DD** – A single recent locality, but systematic survey of potential sites has not been undertaken.  
*Pseudoleskeella catenulata* (Schrad.) Kindb. **LC**  
*Pseudoleskeella nervosa* (Brid.) Nyholm **LC**

- Pseudoleskeella rupestris* (Berggr.) Hedenäs et Söderström **VU** [C2a(i); D2]  
*Pseudoleskeella tectorum* (Brid.) Kindb. ex Broth. **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i,ii); D]  
*Pseudotaxiphyllum elegans* (Brid.) Z. Iwats. **LC**  
*Pterigynandrum filiforme* Hedw. **LC**  
*Pterygoneurum lamellatum* (Lindb.) Jur. **EN** [C2a(i)]  
*Pterygoneurum ovatum* (Hedw.) Dixon **LC**  
*Pterygoneurum sessile* (Brid.) Jur. **LR-nt** [C2a(i)]  
*Ptilium crista-castrensis* (Hedw.) De Not. **LC**  
*Ptychodium plicatum* (Schleich. ex F. Weber et D. Mohr) Schimp. (*Lescuraea plicata* (Schleich. ex F. Weber et D. Mohr) Lindb.) **EN** [B1ab(iii,iv)+2ab(iii,iv)]  
*Prychomitrium polyphyllum* (Sw.) Bruch et Schimp. **RE**  
*Pylaisia polyantha* (Hedw.) Schimp. **LC**  
*Pyramidula tetragona* (Brid.) Brid. **CR** [B1ab(iv,v)+2ab(iv,v); C2a(i)]  
*Racomitrium aciculare* (Hedw.) Brid. **LC**  
*Racomitrium affine* (Schleich. ex F. Weber et D. Mohr) Lindb. **VU** [C2a(i)]  
*Racomitrium aquaticum* (Brid. ex Schrad.) Brid. **LC**  
*Racomitrium canescens* (Hedw.) Brid. subsp. *canescens* **LC**  
*Racomitrium elongatum* [Ehrh. ex] Frisvoll **LC**  
*Racomitrium fasciculare* (Hedw.) Brid. **LC**  
*Racomitrium heterostichum* (Hedw. [ex Hedw.]) Brid. **LC**  
*Racomitrium lanuginosum* (Hedw.) Brid. **LC**  
*Racomitrium macounii* Kindb. subsp. *macounii* **EN** [B1ab(iii)+2ab(iii); C2a(ii)] – Discovered new for the territory by Kučera & Buryová (2001).  
*Racomitrium macounii* subsp. *alpinum* (E. Lawton) Frisvoll **LC** – Reported for the first time by Buryová & Kučera (1999).  
*Racomitrium microcarpon* (Hedw.) Brid. **LC**  
*Racomitrium sudeticum* (Funck) Bruch et Schimp. **LC**  
*Rhabdoweisia crenulata* (Mitt.) H. Jameson **VU** [D2]  
*Rhabdoweisia crispata* (Dicks. ex With.) Lindb. **LC-att**  
*Rhabdoweisia fugax* (Hedw.) Bruch et Schimp. **LC**  
*Rhizomnium magnifolium* (Horik.) T. J. Kop. **LC-att**  
*Rhizomnium pseudopunctatum* (Bruch et Schimp.) T. J. Kop. **CR** [C2a(i)]  
*Rhizomnium punctatum* (Hedw.) T. J. Kop. **LC**  
*Rhodobryum ontariense* (Kindb.) Paris **DD** – Few recent records from the limestone regions of our country. Probably not threatened but at present judgment would be premature.  
*Rhodobryum roseum* (Hedw.) Limpr. **LC**  
*Rhynchostegiella teneriffae* (Mont.) Dirkse et Bouman (*R. teesdalei* (Schimp.) Limpr., *R. jacquinii* (Garov.) Limpr.) **EN** [B2ab(iii); C2a(i)] – Following the synonymization of *R. teesdalei* and *R. jacquinii* with *R. teneriffae* (Dirkse et Bouman 1995), the doubtful Hein's report of *R. teesdalei* (annotation 91 in Váňa 1998) is no longer relevant.  
*Rhynchostegiella tenella* (Dicks.) Limpr. **LR-nt** [C2a(i)]  
*Rhynchostegiella tenuicaulis* (Spruce) Kartt. **DD-va**  
*Rhynchostegium confertum* (Dicks.) Schimp. **DD** – Very little known taxon in our territory. Less than five recent records but probably vastly overlooked at suitable localities.  
*Rhynchostegium murale* (Hedw.) Schimp. **LC**  
*Rhynchostegium rotundifolium* (Scop. ex Brid.) Schimp. **VU** [C2a(i)]  
*Rhytidiadelphus loreus* (Hedw.) Warnst. **LC**  
*Rhytidiadelphus squarrosus* (Hedw.) Warnst. **LC**  
*Rhytidiadelphus subpinnatus* (Lindb.) T. J. Kop. **LC-att**  
*Rhytidiadelphus triquetrus* (Hedw.) Warnst. **LC**  
*Rhytidium rugosum* (Hedw.) Kindb. **LC**  
*Saelania glaucescens* (Hedw.) Broth. **EN** [B2ab(iii); C2a(i)]  
*Santonina uncinata* (Hedw.) Loeske **LC**  
*Schistidium apocarpum* (Hedw.) Bruch et Schimp. **LC**  
*Schistidium brunnescens* Limpr. **LC** – Until now only known in subsp. *brunnescens*.  
*Schistidium confertum* (Funck) Bruch et Schimp. **DD** – Historically commonly reported but mostly based on mis-identifications, partly for the recently recognized taxa. Only two localities known recently; probably a rare

- and perhaps threatened taxon in our territory but systematic focused surveys are necessary to resolve this question.
- Schistidium confusum* H. H. Blom **DD** – Recently described taxon of poorly known ecology and distribution. About 5 recent localities.
- Schistidium crassipilum* H. H. Blom **LC**
- Schistidium dupretii* (Thér.) W. A. Weber **LC**
- Schistidium elegantulum* H. H. Blom **DD** – The same applies as to *S. confusum*; with all probability only subsp. *elegantulum* in our territory.
- Schistidium flaccidum* (De Not.) Ochrya **DD** – Of the 5 historical localities only at one found recently, in a rather small quantity. Most of the other localities have not been recently searched for.
- Schistidium lancifolium* (Kindb.) H. H. Blom **DD** – The same applies as to *S. confusum* and *S. elegantulum*.
- Schistidium papillosum* Culm. **LC**
- Schistidium pruinosum* (Wilson ex Schimp.) G. Roth **DD** – Recent records of this only recently recognized taxon only from Velká kotlina cirque in the Hrubý Jeseník Mts but further localities are expected; the threat cannot be assessed at present.
- Schistidium rivulare* (Brid.) Podp. **LR-nt** [C2a(i)]
- Schistidium robustum* (Nees et Hornsch.) H. H. Blom **LC**
- Schistidium singarense* (Schiffn.) Laz. **LC-att**
- Schistidium trichodon* (Brid.) Poelt var. *trichodon* **LC-att**
- Schistidium trichodon* var. *nutans* H. H. Blom **LC-att**
- Schistostega pennata* (Hedw.) F. Weber et D. Mohr **LC**
- Scleropodium purum* (Hedw.) Limpr. **LC**
- Scorpidium cossonii* (Schimp.) Hedenäs **LR-nt** [B2ab(iii); C2a(i)]
- Scorpidium revolvens* (Sw.) Hedenäs **DD** – Following revision by Hedenäs (1989), this taxon seems, in contrast to *S. cossonii*, to be extremely rare, with certainty known recently only from 2 localities, although some problems with the identification of sterile material have been encountered. Very probably under high risk.
- Scorpidium scorpioides* (Hedw.) Limpr. **VU** [B1ab(iii)+2ab(iii); D2]
- Seligeria acutifolia* Lindb. **EN** [B2ab(iii); C2a(i)]
- Seligeria calcarea* (Hedw.) Bruch et Schimp. **EN** [B2ab(iii); C2a(i)]
- Seligeria campylopoda* Kindb. **EN** [C2a(i)]
- Seligeria donniana* (Sm.) Müll. Hal. **LC**
- Seligeria patula* (Lindb.) I. Hagen **DD-va** – Former report on the occurrence of *Seligeria tristichoides* (Váňa 1997, 1998) should refer here (Gos 1994). Probably only one historical collection.
- Seligeria pusilla* (Hedw.) Bruch et Schimp. **LC-att**
- Seligeria recurvata* (Hedw.) Bruch et Schimp. **LC**
- Serpoleskea confervoides* (Brid.) Loeske (*Amblystegium confervoides* (Brid.) Schimp.) **DD** – Only a very few recent localities for this extremely inconspicuous species have been reported but very few recent surveys have been made in the area of occurrence.
- Serpoleskea subtilis* (Hedw.) Loeske (*Platydictya subtilis* (Hedw.) H. A. Crum) **VU** [C2a(i)]
- Sphagnum affine* Renauld et Cardot **VU** [B1ab(iii)+2ab(iii); D2]
- Sphagnum angustifolium* (C. E. O. Jensen ex Russow) C. E. O. Jensen **DD** – Very little information on this species is available with respect to the previous inclusion in the *Sphagnum recurvum* agg.
- Sphagnum austinii* Sull. ex Austin **RE**
- Sphagnum balticum* (Russow) Russow ex C. E. O. Jensen **LC**
- Sphagnum brevifolium* (Lindb. ex Braithw.) Röhl **LC**
- Sphagnum capillifolium* (Ehrh.) Hedw. **LC**
- Sphagnum centrale* C. E. O. Jensen **LC-att**
- Sphagnum compactum* DC. ex Lam. et DC. **LC**
- Sphagnum contortum* Schultz **VU** [B2ab(iii)]
- Sphagnum cuspidatum* Ehrh. ex Hoffm. **LC**
- Sphagnum denticulatum* Brid. **LC**
- Sphagnum fallax* (H. Klinggr.) H. Klinggr. **LC**
- Sphagnum fimbriatum* Wilson **LC**
- Sphagnum flexuosum* Dozy et Molk. **LC**
- Sphagnum fuscum* (Schimp.) H. Klinggr. **LC**
- Sphagnum girgensohnii* Russow **LC**
- Sphagnum inundatum* Russow **LR-nt** [B2ab(iii)]

- Sphagnum lindbergii* Schimp. ex Lindb. **LC**  
*Sphagnum magellanicum* Brid. **LC**  
*Sphagnum majus* (Russow) C. E. O. Jensen **LC**  
*Sphagnum molle* Sull. **DD-va**  
*Sphagnum obtusum* Warnst. **LR-nt** [B2ab(iii)]  
*Sphagnum palustre* L. **LC**  
*Sphagnum papillosum* Lindb. **LC**  
*Sphagnum platyphyllum* (Lindb. ex Braithw.) Sull. ex Warnst. **CR** [B1ab(iii,iv,v)+2ab(iii,iv,v)]  
*Sphagnum quinquefarium* (Lindb. ex Braithw.) Warnst. **LC**  
*Sphagnum riparium* Ångström **LC**  
*Sphagnum rubellum* Wilson **LC**  
*Sphagnum russowii* Warnst. **LC**  
*Sphagnum squarrosum* Crome **LC**  
*Sphagnum submitens* Russow et Warnst. **LC-att**  
*Sphagnum subsecundum* Nees **LC**  
*Sphagnum tenellum* (Brid.) Brid. **LC**  
*Sphagnum teres* (Schimp.) Ångström **LC**  
*Sphagnum warnstorffii* Russow **LR-nt** [B2ab(iii)]  
*Splachnum ampullaceum* Hedw. **LR-nt** [C2a(i)]  
*Splachnum sphaericum* Hedw. **LR-nt** [C2a(i)]  
*Stegonia latifolia* (Schwägr.) Venturi ex Broth. **DD-va**  
*Syntrichia calcicola* J. J. Amann (*Tortula calcicolens* W. A. Kramer) **LC** – Not included on the previous checklist following the view of Corley et al. (1981). The situation remains controversial, as most recent treatments recognize this taxon but Vanderpoorten (2001) demonstrated a series of intermediates among *S. ruralis*, *S. densa* and *S. calcicola* in Belgian material. The Czech material of *S. calcicola* seems to be distinct with respect to *S. ruralis*, in contrast to *S. densa* (q. v.).  
*Syntrichia caninervis* Mitt. **DD-va** – Only in var. *spuria* (J. J. Amann) R. H. Zander.  
*Syntrichia intermedia* Brid. **LC**  
*Syntrichia laevipila* Brid. **DD-va** – Only two correctly identified specimens exist, collected by Z. Pilous (1949 and 1954) in northern Bohemia. Both specimens emerged only after the Pospíšil's revision of the species which proved all historical specimens (including those provided before by Pilous) having been misidentified. Subsequent search at the localities has been unsuccessful.  
*Syntrichia latifolia* (Bruch ex Hartm.) Huebener **LC-att**  
*Syntrichia norvegica* F. Weber **CR** [B1ab(iii)+2ab(iii); C2a(i,ii)] – Newly discovered at Mt Sněžka (Blockeel et al. 2003).  
*Syntrichia papillosa* (Wilson) Jur. **LC-att**  
*Syntrichia ruraliformis* (Besch.) Cardot **DD** – Only less than 5 recent localities, probably only due to the lack of systematic survey in the taxons regions of occurrence. The taxonomic delimitation against *S. ruralis* has not yet been fully resolved; commonly recognized also at the varietal level as *S. ruralis* var. *arenicola* (Braithw.) J. J. Amann.  
*Syntrichia ruralis* (Hedw.) F. Weber et D. Mohr (incl. *Syntrichia densa* (Velen.) J.-P. Frahm [=*Tortula densa* (Velen.) J.-P. Frahm]) **LC** – The specific status of *S. densa* could not be retained on the basis of the material studied; a similar conclusion was reached by Kramer (1980) and Vanderpoorten (2001).  
*Syntrichia virescens* (De Not.) Ochyra **LC**  
*Taxiphyllum wissgrillii* (Garov.) Wijk et Margad. **LC**  
*Tayloria serrata* (Hedw.) Bruch et Schimp. **EN** [B2ab(iii); C2a(i)]  
*Tayloria splachnoides* (Schleich. ex Schwägr.) Hook. **RE**  
*Tayloria tenuis* (Dicks.) Schimp. **DD-va**  
*Tetraplodon angustatus* (Hook.) Bruch et Schimp. **EN** [C2a(i)]  
*Tetraplodon mnioides* (Hook.) Bruch et Schimp. **EN** [C2a(i)]  
*Tetradontium brownianum* (Dicks.) Schwägr. **VU** [C2a(i)]  
*Tetradontium repandum* (Funck) Schwägr. **LC-att**  
*Thamnobryum alopecurum* (Hedw.) Nieuwl. ex Gangulee **LC**  
*Thamnobryum neckeroides* (Hook.) E. Lawton **DD** – Newly recognized taxon, distributed sparsely in Europe, eastern North America, South Korea, China, India and New Zealand (Mastracci 2003). One of the cited specimens was collected in the Krkonoše Mts (Pilous, Musci čechoslovenici exsiccati No. 714).  
*Thuidium abietinum* (Hedw.) Schimp. var. *abietinum* **LC**

- Thuidium abietinum* var. *hystricosum* (Mitt.) Loeske et Lande **DD** – Following the recent revision of this taxon, only one historical locality could be confirmed, in contrast to the previous treatment by Pilous (1967). The recent distribution is unknown.
- Thuidium delicatulum* (Hedw.) Mitt. **LC-att**
- Thuidium philibertii* Limpr. **LC**
- Thuidium recognitum* (Hedw.) Lindb. **LC**
- Thuidium tamariscinum* (Hedw.) Schimp. **LC**
- Timmia austriaca* Hedw. **DD-va**
- Timmia bavarica* Hessel. **VU** [C2a(i); D2]
- Tomentypnum nitens* (Hedw.) Loeske **LR-nt** [B2ab(iii)]
- Tortella bambergensis* (Schimp.) Broth. **LC**
- Tortella inclinata* (R. Hedw.) Limpr. **LC**
- Tortella tortuosa* (Hedw.) Limpr. **LC**
- Tortula acaulon* ([L. ex] With.) R. H. Zander **LC**
- Tortula atrovirens* (Sm.) Lindb. **CR** [C2a(i); D]
- Tortula cernua* (Huebener) Lindb. **RE**
- Tortula euryphylla* R. H. Zander **EN** [B2ab(iii); C2a(i)]
- Tortula inermis* (Brid.) Mont. (*Syntrichia inermis* (Brid.) Bruch) **DD-va** – In spite of our general acceptance of Zander's classification of Pottiaceae (Zander 1993), this species is retained in *Tortula* rather than *Syntrichia* since it shares of most anatomical and morphological characters of *Tortula*. This view has been recently confirmed by the DNA studies of Werner et al. (2003).
- Tortula lanceola* R. H. Zander **LC**
- Tortula modica* R. H. Zander **LC**
- Tortula mucronifolia* Schwägr. **CR** [B1ab(iii)+2ab(iii); C2a(i); D]
- Tortula muralis* Hedw. var. *muralis* **LC**
- Tortula muralis* var. *aestiva* Hedw. **LC**
- Tortula protobryoides* R. H. Zander **LC**
- Tortula subulata* Hedw. **LC**
- Tortula truncata* (Hedw.) Mitt. **LC**
- Trematodon ambiguus* (Hedw.) Hornsch. **CR** [C2a(i); D]
- Trichodon cylindricus* (Hedw.) Schimp. (*Ditrichum cylindricum* (Hedw.) Grout) **LC**
- Trichostomum brachydontium* Bruch **DD-va**
- Trichostomum caespitosum* (Bruch ex Brid.) Jur. (*Pottiopsis caespitosa* (Bruch ex Brid.) Blockeel et A. J. E. Sm.) **DD-va**
- Trichostomum crispulum* Bruch **LC-att**
- Trichostomum pallidisetum* H. Müll. **DD-va** – Usually recognized recently within the genus *Weissia* under *W. triumphans* (De Not.) M. O. Hill. The taxon is however closest to *Trichostomum caespitosum*. The relationships between *T. pallidisetum* and *T. triumphans* De Not. have not yet been satisfactorily resolved.
- Trichostomum tenuirostre* (Hook. et Taylor) Lindb. **LC-att**
- Ulota bruchii* Hornsch. ex Brid. **LC**
- Ulota coarctata* (P. Beauv.) Hammar **CR** [B1ab(iii,v)+2ab(iii,v); C2a(i); D]
- Ulota crispa* (Hedw.) Brid. **LC**
- Ulota drummondii* (Hook. et Grev.) Brid. **DD-va**
- Ulota hutchinsiae* (Sm.) Hammar **DD-va**
- Warnstorfia exannulata* (Schimp.) Loeske **LC**
- Warnstorfia fluitans* (Hedw.) Loeske **LC**
- Warnstorfia pseudostraminea* (Müll. Hal.) Tuom. et T. J. Kop. **CR** [C2a(i)] – The species has recently been discovered in small quantities at several microsites in the Krkonoše Mts (Úpská jáma cirque). However, the majority of historical collections have been made in the Jizerské hory Mts, where no recent survey has been done.
- Warnstorfia sarmentosa* (Wahlenb.) Hedenäs (*Calliergon sarmentosum* (Wahlenb.) Kindb.) **LC-att**
- Weissia brachycarpa* (Nees et Hornsch.) Jur. **LC**
- Weissia condensa* (Voit) Lindb. **LC**
- Weissia controversa* Hedw. var. *controversa* **LC**
- Weissia controversa* var. *crispata* (Nees et Hornsch.) Nyholm (*W. fallax* Sehm.) **DD** – This taxonomically controversial variety has not been documented recently and the historical status is unknown. Detailed taxonomic-floristic treatments are needed.
- Weissia controversa* var. *wimmeriana* (Sendtn.) Blockeel et A. J. E. Sm. **VU** [D2]

- Weissia longifolia* Mitt. **LC**  
*Weissia rostellata* (Brid.) Lindb. **DD-va**  
*Weissia rutilans* (Hedw.) Lindb. **DD-va**  
*Weissia squarrosa* (Nees et Hornsch.) Müll. Hal. **VU** [C2a(i)]  
*Zygodon dentatus* (Breidl. ex Limpr.) Kartt. **EN** [B1ab(iii)+2ab(iii); C2a(i)]  
*Zygodon rupestris* Schimp. ex Lorentz **EN** [B2ab(iii); C2a(i)]  
*Zygodon viridissimus* (Dicks.) Brid. **RE**

## Not evaluated (NE) taxa

### (a) doubtful taxonomic status

- Andreaea alpestris* (Thed.) Schimp. – The taxonomic identity of the Central European plants growing in the (sub)alpine belt exclusively on rocks is uncertain (see Murray 1988).  
*Bryum dunense* A. J. E. Sm. et H. Whitehouse – Reported as new to the country by Hradílek (2000). The taxon has nevertheless been considered identical to *B. bicolor* by most recent authors (e.g. Nyholm 1993, Vanderpoorten & Zartman 2002)  
*Bryum stirtonii* Schimp. – Whereas most recent authors recognize this taxon, following the treatment of *Bryum capillare* group by Syed (1973), we are not certain in recognizing this taxon with confidence in our region, a view also expressed by Nyholm (1993). It seems however that most records of *B. elegans* apply in fact to *B. stirtonii*, if worth recognition. Revision of the *Bryum capillare* group in our country is badly needed.  
*Tetradontium ovatum* (Funck) Schwägr. – The taxonomic value of this taxon is still controversial. Plants approaching the described characters were found among *T. repandum* specimens.  
*Tortula lingulata* Lindb. – The taxonomy of *Tortula muralis* agg. is at present far from being satisfactory. The characters used for the delimitation of *T. lingulata* from *T. muralis* var. *aestiva* seem to be extremely variable and readily environmentally modified. More studies are necessary to evaluate the taxon properly. '*T. l.*' is known only from the arkoses in Central Bohemia, where it is rather rare and probably threatened.  
*Tortula obtusifolia* (Schwägr.) Mathieu – Regarding the taxonomic status, the same applies as to the preceding taxon. There seems to be a continuum in the phenotypical expressions between *T. muralis* var. *aestiva*, distributed in mesic habitats, '*T. lingulata*' from sandstones and '*T. obtusifolia*' from alpine habitats according to present knowledge. *T. a.* has been reported (and some of the specimens are present in herbarium PRC) from shaded habitats in the thermophilous karst region Český kras.

### (b) doubtful or uncertain occurrence in the Czech Republic<sup>1</sup>

- Fossombronia caespitiformis* De Not. ex Rabenh.  
*Lejeunea ulicina* (Taylor) Gottsche, Lindenb. et Nees – Listed among non-doubtful taxa in Váňa (1997), although the revision of the only record could not be made.  
*Riccia beyrichiana* Hampe ex Lehm.  
*Scapania apiculata* Spruce  
*Bryum arcticum* (R. Br.) Bruch et Schimp. – There is only one source of information on the occurrence in the Czech Republic – a report by C. Müller, cited in Milde (1869) and later authors, quoting his confirmation of the plant from a single collection from the borderline Mt Sněžka made probably shortly before by Boss.  
*Bryum knowltonii* Barnes  
*Bryum warneum* (Röhl.) Blandow ex Brid. – The species is reported by Hein (1874) and Svěrák (1905) from two lowland localities (road cutting and a reed fen) in Northern Moravia. No specimen has ever been seen by any reliable authority; the two specimens are not even cited in Podpěra's monographic treatments of the genus. However, the species might occur or have occurred in our country, as there exist verified records from neighbouring countries.  
*Ceratodon conicus* (Hampe) Lindb. – The occurrence of this taxon in our territory has yet to be proved, although it is highly probable, due to the presence in nearby countries. The inclusion in the previous version of checklist was based on the unpublished revision of I. Novotný. The specimens were nevertheless sterile and therefore not identifiable with certainty (cf. Burley & Pritchard 1990).

<sup>1</sup> Annotations are given only when new information emerged after publication of Váňa (1998) or the status has been re-evaluated to doubtful from 'extant' in Váňa (1997).

*Cinclidium stygium* Sw.

*Cnestrum schisti* (F. Weber et D. Mohr) I. Hagen – There are only three literature reports from our country; two of them have been based on misidentifications (Velenovský's specimen from Brandýs n. Orł. and Matouschek's specimen from Suché skály near Turnov), the third (Pilous's report from Nýznerov) could not be verified (the specimen is probably missing from Pilous's herbarium), the illustration nevertheless does not look convincing. Repeated historical reports have however been from the summit of Bavarian Mt Gr. Arber, close to our boundary.

*Cynodontium fallax* Limpr. – There are many literature reports and even specimens in our herbaria. However, all the herbarium specimens that were fertile proved to be *C. polycarpon*; one fertile specimen was extremely poor (one old capsule), and the sterile specimens are not identifiable. The occurrence of this species in our country is quite probable; one of the syntypes has even been described from the Polish part of the Krkonoše/Karkonosze Mts.

*Cyrto-hypnum minutulum* (Hedw.) W. R. Buck et H. A. Crum

*Cyrtomnium hymenophylloides* (Huebener) T. J. Kop.

*Dichodontium flavescens* (Dicks. ex With.) Lindb. – *D. flavescens* has been recently declared a distinct species by Werner (2002). As Frahm et al. (1998) did not mention this taxon at all in their recent worldwide revision and recognition was previously possible only with fertile material, we have not been able to confirm its presence at our territory. New revision is needed to confirm or exclude the presence of the taxon in the country.

*Grimmia decipiens* (Schultz) Lindb. – The revision of available specimens in our herbaria has not confirmed the occurrence of *G. d.* in our country. The reports from the high mountains (Mt Kotel in the Krkonoše Mts, Petrovy kameny in the Hrubý Jeseník Mts) refer almost certainly to *Grimmia elatior* but unfortunately there remain two other reports from the warmer regions (Chotěboř, Náměšř n. O.), which cannot be à priori excluded; the specimens however seem to have been lost.

*Hypnum cupressiforme* var. *resupinatum* (Taylor.) Schimp. – It is not clear if this oceanic taxon occurs in our territory at all. No specimen has been seen by the authors and a complete revision of the herbarium material has not yet been done.

*Mnium blyttii* Bruch et Schimp. – Based on the available informations (see annotation 21 in Váňa 1998), the historical occurrence of this species in our country could not be confirmed with sufficient certainty.

*Orthotrichum tenellum* Bruch ex Brid.

*Paraleucobryum sauteri* (Bruch et Schimp.) Loeske – The revision of available specimens in our herbaria has not confirmed the historical occurrence in our country. However, correctly identified specimens have been discovered from the Bavarian part of the Šumava Mts (Bayerischer Wald) and the future recovery is possible.

*Pohlia sphagnicola* (Bruch et Schimp.) Broth.

*Racomitrium ericoides* (Brid.) Brid. – Revision of available specimens in our herbaria proved in all cases the misidentification for either *Racomitrium elongatum* or *R. canescens*. One historical collection (leg. Winkelmann 1891), cited by Bednarek-Ochyra (1995), was nevertheless collected probably in the borderline area in the Krkonoše/Karkonosze Mts (Równia pod Śnieżką), maybe just inside our country.

*Rhynchostegium megalopolitanum* (F. Weber et D. Mohr) Schimp. – Revision of available specimens in herbaria PR, PRC, BRNM proved the misidentification for other taxa, in most cases for *Brachythecium oedipodium*.  
*Syntrichia sinensis* (Müll. Hal.) Ochyra

(c) newly excluded taxa

*Jungermannia exsertifolia* subsp. *cordifolia* (Dumort.) Váňa – Plumert's record can be excluded based on the taxon's known distribution and ecology (cf. annotation 61 in Váňa 1998).

*Pleurocladula albescens* (Hook.) Grolle – Kolenati's record is ecologically impossible (cf. annotation 59 in Váňa 1998).

*Riccia michelii* Raddi – Kavina's report is extremely improbable and should be excluded even with respect to his description (cf. annotation 67 in Váňa 1998).

*Saccogyna viticulosa* (L.) Dumort. – The three historical reports can be excluded based on the taxon's known distribution (cf. annotation 64 in Váňa 1998).

*Scapania verrucosa* Heeg – Šmarda's record is ecologically impossible (cf. annotation 63 in Váňa 1998).

*Tritomaria scitula* (Tayl.) Jörg. – Kern's report is extremely dubious (cf. annotation 60 in Váňa 1998).

*Aloina bifrons* (De Not.) Delgad. – Pilous's unpublished doubtful report (cf. annotation 100 in Váňa 1998) can be excluded on behalf of the taxon's known distribution.

*Andreaea heinemannii* Hampe et Müll. Hal. – The doubtful information on the occurrence of the species in former Czechoslovakia (cf. annotation 70 in Váňa 1998) refers probably to the Slovak territory or is erroneous.

- Brachythecium erythrorrhizon* Schimp. – Based on the revisions completed to-date, this taxon has not yet been collected in our territory (cf. annotation 88 in Váňa 1998).
- Brachythecium vanekii* Šmarda – This species has been included in the previous version of the checklist based on the unpublished information (manuscript of threatened mosses of the Krkonoše Mts) given by Mr. Z. Pilous. However, no specimen of *B. v.* was found in Pilous's herbarium.
- Bryum cryophilum* Mårtensson – The doubtful report of this Scandinavian taxon should refer to the Slovak territory (cf. annotation 74 in Váňa 1998, note added in proof).
- Bryum donianum* Grev. – Düll's report of this species from our territory was based on a nomenclatural confusion (wrong synonymization with *Bryum platyloma* Schwägr.); the Podpěra's records of *B. platyloma* belong mostly to *B. capillare*.
- Bryum purpurascens* (R. Br.) Bruch et Schimp. – Based on the distribution of this species, the doubtful unpublished record (cf. annotation 77 in Váňa 1998) has to be excluded.
- Bryum rutilans* Brid. – The same applies as to the preceding taxon (cf. annotation 78 in Váňa 1998).
- Callialaria curvicaulis* (Jur.) Ochyra – The previous reports of this high-alpine taxon (as *Cratoneuron filicinum* var. *curvicaule* (Jur.) Mönk.) are obviously wrong.
- Ceratodon heterophyllus* Kindb. – The report of this species (as *C. purpureus* var. *heterophyllus* Limpr.) from Mt Sněžka (cf. annotation 48 in Váňa 1998) is uncertain. As the material from Central Europe is sterile, the ultimate assignment of the latter taxon to *C. h.* is not assured (cf. Burley & Pritchard 1990).
- Cnestrum alpestre* (Wahlenb.) Nyholm – All reports of this Scandinavian taxon from our country refer probably to the illegitimate homonym *Cynodontium alpestre* Jur., which is a synonym to *Cynodontium fallax*. However, the revision of the available specimens proved that most of them are *C. tenellum*. *Cnestrum alpestre* probably does not occur in Central Europe at all, as pointed already by Grims et al. (1999).
- Didymodon giganteus* (Funck) Jur. – Hein's doubtful report (cf. annotation 104 in Váňa 1998) can be excluded based on the taxons known distribution. All available specimens in the herbaria proved to be different taxa.
- Encalypta mutica* I. Hagen – Pilous's doubtful unpublished report (cf. annotation 98 in Váňa 1998) can be excluded on based on the taxons known distribution.
- Fissidens rivularis* (Spruce) Schimp. – The species was excluded following the revision of available specimens and the ecological data attributed to the remaining ones (cf. annotation 111 in Váňa 1998).
- Hedwigia integrifolia* P. Beauv. – There is an old literature record of this taxon made by Opiz (1828) from Hraběšín near Čáslav. As Opiz in his later major work (Opiz 1852) does not repeat this remarkable find, we believe that he himself, or someone else for him, corrected the earlier identification. The occurrence of this oceanic taxon seems to be most unlikely in our country.
- Hygrohypnum alpestre* (Sw. ex Hedw.) Loeske – The occurrence of this taxon seems to be highly improbable in our country (annotation 85 in Váňa 1998).
- Hygrohypnum eugyrium* (Schimp.) Broth. – The information about the occurrence of this subatlantic species in our country is extremely uncertain; the revision of available specimens has proved the misidentification (cf. annotation 86 in Váňa 1998).
- Isoetecium holtii* Kindb. – The doubtful record from our territory (cf. annotation 90 in Váňa 1998) is phytogeographically most unlikely.
- Leptodontium flexifolium* (Dicks.) Hampe – The occurrence of this species can probably be excluded following the revision of the specimen from Lázně Kynžvart (BRNM). This specimen, belonging to *Hennediella heimii*, was erroneously identified by R. Vaněk as *L. f.* and Prát (1960) then published this revision, with however a different locality (Františkovy Lázně). The locality's name was obviously misspelled.
- Micromitrium tenerum* (Bruch et Schimp.) Crosby – The specimen, described as *Aporella moravica* Podp., does not belong to this taxon (Hradílek in litt.). However, there is another doubtful historical record by Hein (1874).
- Molendoa sendtneriana* (Bruch et Schimp.) Limpr. – The occurrence of the species can be excluded following the revision of herbarium specimens. As noted by Váňa (1998, annotation 106), at least two historical records of this high mountain taxon (from the warmest regions in our country) could not be found in herbaria. However, the other specimens, collected by the same authors at nearby localities, were wrongly identified.
- Neckera oligocarpa* Bruch – The only historical specimen from the Šumava Mts belongs to *N. crispa*.
- Oncophorus virens* (Hedw.) Brid. – The occurrence of the species is extremely improbable. Revision of available herbarium specimens always proved a misidentification. The only report that cannot be fully excluded with respect to ecology and distribution is the unlocalized Opiz's report from the Krkonoše Mts.
- Pohlia erecta* Lindb. – Erroneous report from the Czech Republic was based on a nomenclatural confusion (cf. annotation 79 in Váňa 1998).

- Pohlia flexuosa* Hook. – The species has been published new for the territory by Pilous (1994). However, the revision of the specimen confirmed T. Arts's (unpublished) opinion that one specimen belongs to *P. proliger*, the other to *P. nutans*. A third specimen, not sent by Z. Pilous to T. Arts, belongs also to *P. proliger*.
- Polytrichum swartzii* Hartm. – The information about the occurrence of this Scandinavian taxon in our country is obviously wrong (cf. annotation 71 in Váňa 1998).
- Pterogonium gracile* (Hedw.) Sm. – Hein's and Weidmann's doubtful reports (cf. annotation 96 in Váňa 1998) can be excluded based on the taxon's known distribution.
- Scleropodium touretii* (Brid.) L. F. Koch – Hein's doubtful report (cf. annotation 92 in Váňa 1998) can be excluded based on the taxon's known distribution.
- Seligeria trifaria* (Brid.) Lindb. – The Velenovský's report (cf. annotation 112 in Váňa 1998) is extremely improbable with respect to known distribution and ecology of the species; it was probably based on the trifarious *Seligeria patula*, occurring in the Český kras region.
- Seligeria tristichoides* Kindb. – This species, reported from the Czech Republic based on an unpublished record (cf. annotation 52 in Váňa 1998) was later identified as *S. patula* by Gos.
- Sphagnum pulchrum* (Lindb. ex Braithw.) Warnst. – The occurrence of this northern and oceanic species in our country is highly improbable. The revision of available herbarium specimen proved the misidentification for *S. brevifolium*, as pointed out by Váňa (1998) (annotation 69).
- Taxiphyllum densifolium* (Lindb. ex Broth.) Reimers – The only record corresponds to *T. wissgrilli* (cf. annotation 95 in Váňa 1998).
- Tortella densa* (Lorentz et Molendo) Crundw. et Nyholm – The species has been reported from a single locality (cf. annotation 42 in Váňa 1998), another specimen labelled *T. densa* was found in herbarium BRNM, collected by Pokluda in Mts Rychlebské hory. The revision of both specimens revealed a misidentification for *T. tortuosa* and *T. inclinata*, respectively.
- Tortella fragilis* (Hook. et Wilson) Limpr. – The occurrence of the species was excluded following the complete revision of available herbarium specimens. Several historical specimens, which were missing in the herbaria, can be excluded based on the reported locality and ecology (cf. annotation 107 in Váňa 1998).
- Ulota curvifolia* (Wahlenb.) Lilj. – The occurrence of this taxon in our country is extremely improbable (cf. annotation 73 in Váňa 1998).
- Weissia sterilis* W. E. Nicholson – Pilous's unpublished doubtful report (cf. annotation 103 in Váňa 1998) can be excluded based on the taxon's known distribution.

## Discussion

### Checklist

The last version of the checklist (Váňa 1997) included 847 unproblematic species (4 hornworts, 205 liverworts, 638 mosses), plus 63 species regarded as doubtful. The present list includes 849 species (4 hornworts, 204 liverworts, and 641 mosses) plus 24 infraspecific taxa; 23 additional species are regarded as doubtful, and 6 other taxa are regarded as taxonomically dubious. Despite the nearly equal number of accepted species, the number of identical species shared with the previous version is only 817. This means that there has been a rather significant flux between the categories of accepted, doubtful and excluded species in both directions. Eighteen moss taxa have been found new to the territory, and some other changes have been incurred by the new taxonomic treatments.

### Red List

According to the present state of knowledge, 3.1% of the historically known bryoflora of the Czech Republic is thought to be extinct, 23.6% is regarded as threatened according to the IUCN 3.1 criteria including CR (7.1%), EN (7.8%) or VU (8.7%) categories, 5.7% is regarded as Lower Risk (near threatened taxa), and 16.2% is data deficient (of which 7.8% has been evaluated as vanished). 51.5% of our bryoflora is regarded as Least Concern –

Table 1. – Comparison of the number and percentage of redlist-evaluated taxa between the current and previous version of the Red List. See text for abbreviations of categories.

Categories used			Hornworts and liverworts		
This study		Váňa 1993, 1995	This study		Váňa 1993
EX (RE)		Ex	6 (2.8%)		23 (10.7%)
CR		E	19 (8.9%)		48 (22.4%)
EN		V	24 (11.2%)		30 (14.0%)
VU			R	29 (13.6%)	
LR-nt		not used	13 (6.1%)		0
DD (s. str.)	DD	K	15 (7.0%)	28 (13.1%)	1 (0.5%)
DD-va			13 (6.1%)		
LC-att	LC	–	21 (9.8%)	95 (44.4%)	101 (47.2%)
LC (s. str.)			74 (34.6%)		

not threatened but about one quarter of these (10.1% of the total) is either locally important or little known and therefore evaluated as worth further attention ('attention list'). Opportunities for comparison of the Red List with neighbouring countries are extremely limited, as the criteria for threat categories in the other territories are derived from older, superseded IUCN versions, or are not IUCN at all. The former situation complicates the comparison of the present Red List with the previous version of the Czech Red List of bryophytes (Table 1).

A major difference between the previous and current versions of the Red List is the number of taxa evaluated as extinct from the region (however the differences diminish if we add the 'vanished' category to the proven extinct) and in the number of taxa evaluated as Data Deficient. Nevertheless, the greatest difference is between the total numbers of taxa regarded as threatened, especially among the mosses (20.3% of moss taxa in the categories CR+EN+VU versus 42.5% of moss taxa evaluated as E+V+R in Váňa 1995). This can be partly explained by the large number of recent field surveys that have resulted in the discovery of new localities or re-discovery of historical ones for taxa believed to be threatened or vanished. Nevertheless, a significant part (24%) of the number of taxa, previously believed to be threatened, moved to the DD (notably DD-va) category and the newly excluded taxa.

Interestingly, the overall percentage of redlist and non-redlist taxa is rather similar throughout the heavily industrialized Central Europe, despite the different criteria used. It is ranging from about 40–50% of redlist taxa, as evidenced by the Austrian (Saukel & Köckinger 1999, Grims & Köckinger 1999), German (Jedicke 1997), Slovak (Kubinská et al. 2001), Luxembourgian (Werner 2003) or Dutch (Siebel et al. 2000) Red Lists. On the other hand, in United Kingdom and Nordic countries, where the taxa were evaluated according to the same or largely similar IUCN 2.3 criteria (Frisvoll & Blom 1997, Gärdenfoss 2000, Church et al. 2001, Rassi et al. 2001) give a substantially smaller number of threatened taxa, ranging between about 15–30% (the exact percentage is difficult to calculate due to the non-contemporaneously published checklists). This probably reflects the better general health of the Nordic flora.

Mosses		Bryophytes total			
This study		Váňa 1995	This study		Váňa 1993, 1995
21 (3.2%)		40 (6.2%)	27 (3.1%)		63 (7.3%)
43 (6.5%)		115 (17.7%)	62 (7.1%)		163 (18.9%)
44 (6.7%)		129 (19.9%)	68 (7.8%)		159 (18.4%)
47 (7.1%)			76 (8.7%)		
37 (5.6%)		32 (4.9%)			42 (4.9%)
37 (5.6%)		0	50 (5.7%)		0
58 (8.8%)	113 (17.1%)	10 (1.5%)	73 (8.4%)	141 (16.2%)	11 (1.3%)
55 (8.3%)			68 (7.8%)		
67 (10.2%)	354 (53.7%)	322 (49.6%)	88 (10.1%)	449 (51.4%)	423 (49.0%)
287 (43.6%)			361 (41.4%)		

Another interesting point is the interpretation of uncertainty. While most red lists admit less than 5%, or none at all, of data deficient taxa, we have adopted a more rigorous approach with 16% of DD taxa. The IUCN recommendation for maximum decisiveness has been strictly adhered to; we have evaluated all available information. Another reason for the relatively large number of DD taxa has been the inclusion of ‘vanished’ taxa into this category. We believe that this is the correct interpretation, rather than the usual splitting of vanished taxa among the RE, CR and NE categories.

The creation of the attention list (LC-att) within the Least Concern category is hoped to have two positive effects: the acquisition of new distribution and population data on little known and rare taxa which do not qualify for inclusion on the Red List at present, and to acquire better knowledge of poorly known localities.

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## Souhrn

Po deseti letech od publikace prvního českého Červeného seznamu játrovek a hlevíků a sedmi letech od podobného zpracování mechů je publikována nová verze Červeného seznamu mechorostů podle nových kritérií IUCN (3.1). Červený seznam je poprvé publikován jako součást aktualizovaného kompletního seznamu mechorostů ČR, v souladu s doporučeními IUCN. Seznam mechorostů poprvé obsahuje kriticky vybrané infraspecifické taxony. Pro bryofloru České republiky bylo akceptováno 849 druhů (4 druhy hlevíků, 204 druhů játrovek a 641 druhů mechů), spolu s dalšími třemi poddruhy mechů, dvěma poddruhy játrovek, 4 varietami játrovek a 15 varietami mechů (tedy celkem 210 taxonů játrovek a 659 taxonů mechů); 4 další druhy játrovek a 19 druhů mechů (s 1 další varietou) byly vyhodnoceny jako pochybné pro nedoložený výskyt, 6 taxonů mechů na druhové úrovni bylo vy-

hodnoceno jako taxonomicky pochybné. Šest druhů játrovek a 36 druhů mechů (z těch, které v minulé verzi seznamu byly hodnoceny jako ověřené nebo pochybné) bylo z flóry nově vyloučeno.

Pro účely Červeného seznamu bylo hodnoceno 873 taxonů (kromě vyloučených druhů nebyly hodnoceny taxony s nejistým výskytem v ČR a taxonomicky problematické druhy), 424 z nich (tj. 48.6 %) jich bylo zařazeno do některé z kategorií ohrožení či jako vyhynulé. Mezi taxony nedostatečně známé (DD) byly jako nově vytvořená podkategorie zařazeny i druhy nezvěstné (DD-va), tj. takové, u nichž nebylo úplné vymizení dostatečně věrohodně prokázáno. Mezi druhy neohroženými (LC) byla vylíšena podkategorie taxonů vyžadujících pozornost (LC-att), zahrnující druhy regionálně ohrožené nebo významné, případně nedostatečně známé, avšak takové, u nichž ohrožení nebylo s dostatečnou jistotou předpokládáno

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## Erratum

*Straminergon stramineum* (Brid.) Hedenäs (*Calliergon stramineum* (Brid.) Kindb.) LC – The species has been unwittingly omitted from the moss species list. The total number of mosses thus changes to 642, making the total for bryophytes 850. The numbers given in Table 1 subsequently increase by one in LC category for mosses and bryophytes total, and the percentages change in the total for LC mosses (53.8%) and the totals for LC (51.5%) and DD (16.1%) bryophytes.