

**HOLEC J. & BERAN M. [eds.] (2006): Červený seznam hub (makromycetů) České republiky [Red list of fungi (macromycetes) of the Czech Republic]. – Příroda, Praha, 24: 1-282. [in Czech with English summary]**

**Summary**

A first version of the Red List of threatened fungi of the Czech Republic (CR) is presented. Theoretically, a Red List should be the first basic document if a wise and serious approach in conservation of any group of organisms is applied. However, due to various historical circumstances, the first publication evaluating the threat of fungi in the area of the contemporary Czech Republic was the Red Book of the Slovak and Czech Republics (KOTLABA et al. 1995). This book contains 119 species of fungi, which are described in detail (morphological description, biology, ecology, local and world distribution) and are all documented by a colour illustration and a distribution map. The low number of species does not reflect the real situation of threat to fungi and the species have to be considered examples of threatened groups of macrofungi.

As a next step in the conservation of fungi in the CR, 46 species were included into the list of organisms protected by law in 1992. Most of them were selected from those elaborated in the Red Book (see above). These protected species were presented to the general public by Antonín & Bieberová (1995). In 2005, mycologists proposed to update and extend the list, which then included 95 species of fungi to be judged by lawmakers in the near future.

In 2002, J. Holec and M. Beran (editors) addressed mycologists (both professionals and amateurs) in the Czech Republic to interest them to collaborate on the Red List of threatened fungi. Most of them reacted positively and so in 2003 a team of 22 authors was created (for names of authors and elaborated genera of fungi see the chapter Materials and Methods [Metodika in Czech]).

The subsequent work on the List was led by the following principles: 1. categories of threat by IUCN were used but slightly modified (see below); 2. as it is a first version of the Red List in the Czech Republic, some groups of fungi are elaborated less intensively (they are represented by a lower number of species than those really threatened – e.g. *Geoglossaceae*, cyphelloid fungi, *Agaricus*, *Conocybe*, *Entoloma*, *Galerina*, *Inocybe*) or fully omitted (*Ahnicola*, *Naucoria*, *Hebeloma*, hypogeous fungi) due to the lack of specialists or their lack of time; 3. the threat of individual species is evaluated exclusively according to the situation in the Czech Republic; 4. the threat is evaluated according to the „recent“ situation, i.e. according to the occurrence in the years 1995–2005 (some records made in 2006 were also included); this period is characterised by a slightly more frequent occurrence of some rare species when compared with the „worst years“ (about 1971–1990) when negative human impact on nature (acid rain, air and water pollution etc.) was the highest; 5. the threat of individual species is evaluated according to the number of localities found in the period 1995–2005 or by comparison of their occurrence in this period with the former state, i.e. until 1970 (the period when the occurrence of fungi was still „rather normal“; this period is termed “original state” in next paragraphs); 6. the Red List contains only species which have been revised taxonomically (using the morphological species concept) and proved to be „good species“ (except for several species described from the Czech Republic in the past 50 years); this means that e.g. some new taxa described by J. Velenovský but not revised to date are not included; 7. various groups and genera are elaborated in a slightly different way depending on the fact if the author is a specialist of this group (having long-term data and rich field experience with them) or not; 8. only macromycetes with fruitbodies or stromata larger than 2 mm are included, a group which represents the common scope of field mycologists and is well documented by published and herbarium data; 9. the Red List is not only an enumeration of threatened taxa but also contains data on the individual species useful for local mycologists and people working in nature conservation (for details see below)

The following categories of threat were used (based on IUCN guidelines, see IUCN 2001, 2005; for references see the chapter Material and Methods [Metodika in Czech]; the categories were slightly modified owing to the specific biology and ecology of fungi and history of the environmental load in the Czech Republic).

?EX: probably extinct – taxa not found after 1970. This category is not included in the IUCN materials (see above), however, with fungi we never know if the mycelium is present in the substrate even in the situation when no fruitbodies have been found for a long time. This was the reason to incorporate probability (with the symbol ‘?’) into category EX. In such taxa, the data on the last recorded locality are added.

CR: critically endangered – rare and threatened taxa known from a low number of localities (1–5) situated in threatened habitats (like wetlands, mowed meadows, virgin forests etc.) or taxa rapidly disappearing (number of localities not more than 10 % of the original state) due to successional changes in habitats (e.g. shrubs encroaching on rock steppes or meadows) or due to the high environmental load. In such taxa, the authors mention all localities known since 1971 (according to published and herbarium data and unpublished finds of the authors and their colleagues).

EN: endangered – taxa with a low number of localities (6–20) or taxa disappearing (number of localities up to 50% of the original state) due to the environmental load. In such taxa, the authors list areas of occurrence in the CR (according to published and herbarium data and unpublished finds of the authors and their colleagues).

VU: vulnerable – taxa slightly but distinctly disappearing (number of localities up to 50–80% of the original state) in the whole CR or in some areas of the CR. It mostly relates to taxa growing in disappearing habitats (like oligotrophic meadows and pastures, wetlands, rock steppes etc.) or taxa affected by air pollution, eutrophication etc. (e.g. some mycorrhizal fungi). In such taxa, the authors give the areas of occurrence in the CR (according to published and herbarium data and unpublished finds of the authors and their colleagues).

NT: near-threatened – taxa potentially threatened in the near future due to the environmental load or taxa depending on special management of their habitats (mowing of meadows, pasturing, occurrence of old or dying trees in avenues etc.) or species with an ephemeral character of occurrence on temporary substrates. Finally, species considered rare or disappearing in the past but recently found at new localities are also classified to this category.

DD: data deficient – this is in fact not a category of threat but only a statement that the status of threat is not known due to lacking data. In such taxa, it is desirable to obtain more data to evaluate their category of threat in the future. Examples: newly described taxa recently known from one or several localities but potentially much more distributed, rare taxa with taxonomic problems, taxa that are considered by the specialists to be rare, in which case their inclusion in the Red List helps to collect more data on their occurrence and status of threat.

In the next paragraphs, the term „species“ will be used instead of „taxon“ as almost all taxa included in the Red List are species. The data on individual species are given by different authors (or small teams of authors), who are in most cases specialists of these taxa. The authors used their own data and long-term, in older generation of mycologists (F. Kotlaba, Z. Pouzar, M. Svrček) even lifelong, experience, which is a valuable contribution to the Red List. The authors also used reliable recent data from their field collaborators (mostly mycological friends and colleagues) and published data. Most authors further used herbarium data from the largest mycological herbaria in the CR (especially PRM, BRNM and CB). Consequently, the texts on the species have a reliable basis and represent a valuable core of information on ecology, distribution and status of threat of the taxa in the List.

The text on the taxa is structured as follows:

1. Latin name with authors abbreviations; 2. important synonyms (not given in all species); 3. Czech name (the List should also serve as a reference for the national nomenclature); 4. category of threat (for abbreviations see above); 5. indication of trophic group (see chapter Material and Methods [Metodika in Czech]); 6. ecology, distribution and status of threat in the Czech Republic; 7. abbreviations of authors (see chapter Material and Methods); 8. Literature on the taxonomy and iconography of the species in question. The references cover the description of macro- and microcharacters, line drawings of microcharacters and a colour illustration (drawing, painting or photograph). Common Czech literature was primarily selected, if absent, references to foreign floras, monographs or journals were added. In some species, basic mycofloristic publications were also cited, however, the literature does not cover all published data on the occurrence of the species in the CR. The chief aim of the references is to demonstrate the taxonomic concept used and to help mycologists and people working in nature conservation to identify the taxa which are in many cases very rare and not described or not depicted in Czech mycological literature.

The Red List comprises data on 904 species (5 of them given more exactly to the rank of variety) of macromycetes, of which 81 are ascomycetes and 823 basidiomycetes. From the trophical point of view, there are 2 species of lichenised basidiomycetes (lichenised ascomycetes, i.e. the core of lichens, are not included in this List; a Red List of lichens of the CR will be published by lichenologists); 282 mycorrhizal fungi (31 %); 40 parasites and saproparasites (5 %); 567 species of saprotrophic fungi (63 %), most of them lignicolous saprotrophs (255 species = 28 % of the total number of species) and terrestrial saprotrophs (249 species = 28 % of the total number of species). The remaining group (8 %) is represented by species with intermediate trophism (e.g. mycorrhizal-saprotrophic) and saprotrophic fungi confined to special substrata (e.g. anthracophilous, fungicolous, graminicolous, herbicolous, coprophilous, muscicolous). For complete data, tables and graphs, see the chapter Conclusions [Závěry in Czech].

Concerning the categories of threat, the results are as follows:

<b>category of threat</b>	<b>?EX</b>	<b>CR</b>	<b>EN</b>	<b>VU</b>	<b>NT</b>	<b>DD</b>	<b>Total</b>
number of species	84	229	227	75	72	217	904
%	9	25	25	8	8	24	100

When the probably extinct and really threatened species are considered (those classified as DD must be excluded in this case), we obtain a number of 687 species. The expected number of macromycetes in the Czech Republic is about 3000–4000 (there is no published checklist for the CR) so that about 20–25% of the mycobiota of the Czech Republic is more or less threatened. This is really alarming!

There is a surprisingly high number of probably extinct species, which however well correlates with the high environmental load in the Czech Republic, especially in the period 1970–1990. The classification of taxa in this category should initiate intensive search for them in the field which could render new finds, especially now that some positive changes (lower rate of air and water pollution) have been recently observed in the CR. The same relates to taxa classified as DD.

We hope and wish that the next version of the Red List of fungi of the Czech Republic will be more exact and especially poorer in species.