

## RED LIST OF MACROFUNGI OF HUNGARY (REVISED EDITION)

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Several species of various living organisms are under protection in Hungary, but fungi, although, unfavourable anthropogenic influences do not avoid them either. Lists of protected fungi are usually given by the Red Data Books published recently in several European countries. The main goal of this paper is the presentation of a list of endangered macrofungi in Hungary. The list reflects our present knowledge about the species require urgent protection and about the categories into which they have to be classified for the sake of their successful protection.

Key words: macrofungi, protection, Red Data List

### INTRODUCTION

Increasing anthropogenic influences affect harmfully natural ecosystems, and a growing number of species becomes endangered. Thus, for about two decades, all over the world so-called Red Data Books and Red Data Lists have been compiled, which specify taxa threatened by extinction and outline the feasibilities of their protection.

Fungi have been simply omitted by the nature conservation measures and red data lists for a long time (RAKONCZAY 1990). In Europe the supplementation of this insufficiency began in the eighties and macrofungi were also registered in some red lists (WINTERHOFF and KRIEGLSTEINER 1984, RASSI and VÄISÄNEN 1987, WÖLDECKE 1987, SCHMID 1990, BEDIKSEN and HOILAND 1992). In the last years some works were also published about the possibilities of the protection of macrofungi in Hungary (BABOS 1989, RIMÓCZI 1992a, 1992b, SILLER and VASAS 1993, 1995). In his article RIMÓCZI (1992b) examined the present situation in the country and set the most important duties to be done. The aim of the present work is to complete the red data list of macrofungi, which can be immediately submitted to the officials who are authorized to take the necessary legislative measures.

The proposed list was compiled by the contribution of several Hungarian mycologists (Albert L., Babos M., Bohus G., Bratek Z., Locsmándi Cs., Rimóczi I., Siller I. and Vasas G.), who determined the endangered categories considering

the Hungarian conditions, discussed the possible causes of threatening as well as the standardized aspects necessary for the selection of species for protection. The above-mentioned mycologists feel it necessary to carry out direct research for conservation purposes, e.g. evaluation of mycologically less investigated areas as well as distribution studies of endangered species.

The list published hereafter represents the first stage of an attempt to rescue of endangered macrofungi in Hungary. The list reflects our present knowledge about the species should be protected most urgently and about the categories into which they can be classified to promote their successful protection. Latin names of macrofungi were taken from the works of DENNIS (1978), MOSER (1983) and JÜLICH (1984).

#### RECOMMENDED RED DATA LIST OF MACROFUNGI IN HUNGARY

1. Vanished species. Species belonging to this category are represented by a single former known occurrence only. At present they can not be found, or their habitat has been changed or destroyed.

- Agaricus lutosus* (F. H. Møller) F. H. Møller  
*Clitopilus hobsonii* (Berk. et Broome) P. D. Orton  
*Clitopilus scyphoides* (Fr.) Singer f. *scyphoides* Noordel.  
*Coprinus micaceus* (Bull. : Fr.) Fr. var. *mamosus* Babos  
*Coprinus spilosporus* Romagn.  
*Coprinus tigrinellus* Boud.  
*Gymnopilus spectabilis* (Fr.) Singer var. *junonia* (Fr.) J. E. Lange  
*Gymnopilus stabilis* (Weinm.) Kühner et Romagn.  
*Hemimycena cucullata* (Pers. : Fr.) Singer  
*Hemimycena delicatella* (Peck) Singer  
*Hohenbuehelia mastrucata* (Fr.) Singer  
*Hygrotrama foetens* (Phill. : Berk. et Broome) Singer  
*Omphalina smaragdina* (Berk.) Malençon et Berth.  
(syn. *O. chlorocyanea* (Pat.) Singer)  
*Panaeolus cyanescens* Berk. et Broome  
*Panaeolus guttulatus* Bres.  
*Pholiotina cyanopus* (G. F. Atk.) Singer  
*Psathyrella abortiva* A. H. Sm.  
*Psathyrella albidula* (Romagn.) Moser  
*Tephroclybe mephitica* (Fr.) Moser

2. Species endangered by extinction, vulnerable and rare species. These three categories – generally accepted in the international literature – were fused because of the insufficiency of the data available. Almost extinct and very rare macrofungi living in extremely endangered biotopes belong to the first group; macrofungi living in seriously endangered biotopes as well as declining and in some areas already extinct species fall into the second group; at present still not rare, however, in some areas sporadic macrofungi, and generally those living in endangered biotopes or having very special ecological demands belong to the third group. These three, fused groups are recommended for protection. The species are as follows:

## AGARICALES

- Agaricus bernardiiiformis* Bohus  
*Agaricus macrosporoides* Bohus  
*Amanita caesarea* (Scop. : Fr.) Pers. : Schw.  
*Amanita beckeri* Huijsman  
*Amanita ovoidea* (Bull. : Fr.) Quéf.  
*Amanita regalis* (Fr.) Michael  
*Amanita solitaria* (Bull.) Mérat  
*Boletus dupainii* Boud.  
*Boletus fechtneri* Vel.  
*Boletus regius* Krombh.  
*Boletus rhodopurpureus* Smotl.  
*Boletus rhodoxanthus* (Krombh.) Kallenb.  
*Boletus torosus* Fr.  
*Camarophyllus lacmus* Fr.  
*Chalciporus rubinus* (W. G. Smith) Singer  
*Gomphidius roseus* (L.) Fr.  
*Hebeloma ammophilum* Bohus  
*Hebeloma ochroalbidum* Bohus  
*Hygrocybe cantharellus* (Schwein.) Murrill  
*Hygrocybe laeta* (Pers. : Fr.) P. Karst.  
*Hygrocybe marchii* Bres.  
*Inocybe dunensis* P. D. Orton  
*Inocybe halophila* R. Heim  
*Inocybe javorkae* Babos et Stangl  
*Lactarius flexuosus* Fr.  
*Lactarius lilacinus* (Lasch) Fr.  
*Lactarius mammosus* Fr.  
*Lactarius sphagneti* (Fr.) Neuhoff

*Leccinum holopus* (Rostk.) Watl.  
*Leccinum variicolor* Watl.  
*Leucoagaricus carneifolius* (Gillet) Wasser  
*Limacella ochraceolutea* P. D. Orton  
*Oudemansiella nigra* Dörfelt  
*Phyllotopsis nidulans* (Pers. : Fr.) Singer  
*Pleurotus eryngii* (DC. : Fr.) Quél. var. *ferulae* Lanzi  
*Pulveroboletus cramesinus* (Secr.) Singer  
*Rhodotus palmatus* (Bull. : Fr.) Maire  
*Russula rhodopoda* Zv.  
*Russula rubra* Krombh.  
*Russula seperina* Dup.  
*Russula torulosa* Bres.  
*Russula viscida* Kudr.  
*Squamanita schreieri* Imbach  
*Suillus aeruginascens* (Secr.) Snell  
*Suillus placidus* (Bon.) Singer  
*Tricholoma atosquamosum* (Chev.) Sacc.  
*Tricholoma aurantium* (Schaeff. : Fr.) Ricken  
*Tricholoma bresadolianum* Clémentçon  
*Tricholoma focale* (Fr.) Ricken  
*Tricholoma goniospermum* Bres.  
*Tricholoma orirubens* Quél.  
*Tricholoma pardinum* Quél.  
*Tricholoma sulphurescens* Bres.  
*Volvariella bombycina* (Pers. : Fr.) Singer  
*Volvariella surrecta* (Knapp) Singer  
*Xerocomus parasiticus* (Bull. : Fr.) Quél.

#### GASTEROMYCETES

*Anthurus archerii* (Berk.) E. Fischer  
*Geastrum badium* Pers.  
*Geastrum hungaricum* Hollós  
*Geastrum pseudostriatum* Hollós  
*Geastrum melanocephalum* (Czernajev) Stanek  
*Hymenogaster cerebellum* Cavara  
*Montagnea arenaria* (DC.) Zeller (syn. *M. radiosa* (Pallas) P. Henn.)  
*Myriostoma coliforme* (Dicks. : Pers.) Corda  
*Phellorinia herculeana* (Pallas : Pers.) Kreisel (syn. *Ph. inquinans* Berk.)

*Pisolithus arhizus* (Pers.) Rauschert (syn. *P. tinctoria* (Pers.) Desv.)  
*Tulostoma volvatum* Borscow

## ASCOMYCETES

*Elaphomyces maculatus* Vitt.  
*Elaphomyces virgatosporus* Hollós

## APHYLLOPHORALES

*Albatrellus cristatus* (Schaeff. : Fr.) Kotl. et Pouzar  
*Albatrellus pes-caprae* (Pers. : Fr.) Pouzar  
*Gomphus clavatus* (Pers. : Fr.) S. F. Gray  
*Hydnum repandum* L. : Fr.  
*Hydnum rufescens* Fr.  
*Polyporus rhizophilus* Pat.  
*Sarcodon fuligineo-violaceus* (Kalchbr. in Fr.) Pat.  
*Sarcodon imbricatus* (L. : Fr.) P. Karst.  
*Sarcodon scabrosus* (Fr.) P. Karst.

3. Care-demanding species. Macrofungi, which became endangered because of the mass gathering and selling as well as those species, which are still not rare, but are decaying mycorrhizal companions of forest trees or important representatives of the characteristic mycoflora of Hungary, are listed in this group.

## AGARICALES

*Agaricus bernardii* (Quél.) Sacc.  
*Agaricus bohusii* Bon  
*Agaricus maskae* Pilát  
*Amanita vittadinii* (Mor.) Vittad.  
*Armillaria rickenii* Bohus  
*Boletinus cavipes* (Opat.) Kalchbr.  
*Boletus appendiculatus* Schaeff. : Fr.  
*Clitocybe alexandri* (Gillet) Konrad  
*Clitocybe maxima* (Fl. Wett. : Fr.) P. Kumm.  
*Cortinarius moserianus* Bohus  
*Cortinarius paracephalixus* Bohus  
*Cortinarius parumatus* Bohus

*Cortinarius praestans* (Cord.) Gillet  
*Cortinarius xanthophyllus* Cooke  
*Gyrodon lividus* (Bull. : Fr.) Sacc.  
*Hygrocybe conicoides* (P. D. Orton) Ort. et Watl.  
*Hygrophorus russula* (Schaeff. : Fr.) Quél.  
*Inocybe aeruginascens* Babos  
*Lactarius volemus* Fr.  
*Leucoagaricus arenicola* (Menier) Bon et Boiffard  
*Leucoagaricus subvolvatus* (Malençon et Bert.) Bon  
*Leucoagaricus wychanskyi* (Pílát) Singer  
*Leucopaxillus cutefractus* Noordel.  
*Leucopaxillus giganteus* (Fr.) Singer  
*Leucopaxillus lepistoides* (Maire) Singer  
*Leucopaxillus macrocephalus* (Schulzer) Bohus  
*Leucopaxillus rhodoleucus* (Romell) Kühner  
*Limacella guttata* (Fr.) Konrad et Maubl.  
*Pleurotus calyptratus* (Lindblad in Fr.) Sacc.  
*Pleurotus dryinus* (Pers. : Fr.) P. Kumm.  
*Psathyrella ammophila* (Dur. et Lév.) P. D. Orton  
*Psathyrella calcarea* (Romagn.) Moser  
*Psathyrella subatrata* (Batsch : Fr.) Gillet  
*Russula aurata* (With.) Fr.  
*Russula paludosa* Britzelm.  
*Russula sardoniana* Fr. emend. Romell  
*Strobilomyces floccopus* (Vahl in Fl. Dan. : Fr.) P. Karst.

#### GASTEROMYCETES

*Battarraea phalloides* (Dicks.) : Pers.  
*Battarraea stevenii* (Liboschitz) Fr.  
*Endoptychum agaricoides* Czernajev  
*Geastrum fornicatum* (Huds. : Pers.) Hooker  
*Geastrum sessile* (Sow.) Pouzar  
*Geastrum triplex* Jungh.  
*Geastrum vulgatum* Vittad.  
*Mycenastrum corium* (Guersent : DC.) Desv.  
*Tulostoma brumale* Pers. : Pers.  
*Tulostoma fimbriatum* Fr.  
*Tulostoma kotlabae* Pouzar  
*Tulostoma melanocyclum* Bres. in Petri  
*Tulostoma squamosum* Gmel. : Pers.

## APHYLLOPHORALES

*Polyporus tuberaster* (Pers.) : Fr.

## ASCOMYCETES

*Tuber aestivum* Vittad.

To promote the protection of macrofungi in Hungary introduction of the following measures is recommended:

- endangered macrofungi in the national parks, nature reserves, as well as landscape protection areas should be in practice protected (gathering of the mushrooms in these areas must be prohibited with the exception of salable species).
- macrofungi, recommended for protection, should not be permitted to sell.
- care-demanding macrofungi should be gathered only moderately.

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(Received on 15 December, 1994)