

PROTECTED SPECIES OF MACROMYCETES IN THE REPUBLIC OF MONTENEGRO

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ABSTRACT

We give a list of protected species of macromycetes with the national legislative in the territory of Montenegro. This list is based on the published scientific papers. The author's unpublished data were used as well. Complying with recent efforts to catalogue the mycological records and in accordance with the knowledge on rare and threatened species in Europe, it becomes possible to select some species important for protection and conservation in Montenegro. For this purpose the list of protected species of macromycetes in Montenegro has been elaborated. The list is an open working document aimed at offering a definite estimation. The list has been made according to the following criteria: (i) presence of the species on the European Red List, groups A, B, C and D (Ing, 1993), and which are rare or endangered in Montenegro; (ii) species which are included in ECCF Project "Mapping and monitoring of threaten fungi in Europe" (50 threatened fungal species, including all 33 species candidates for listing in Appendix 1 of the Bern Convention - 2001), and which are rare or endangered in Montenegro; (iii) species which are especially rare or rare in Montenegro, endangered because of excessive exploitation; (iv) species with locus classicus in Montenegro; (v) species restricted to rare or endangered habitats and substrates. A total of 111 species of macromycetes in Montenegro are selected. 98 species belong the Basidiomycotina and 13 species to the Ascomycotina. That is the first list of fully protected macromycetes in Montenegro.

Key words: macromycetes, protected species, The Republic of Montenegro.

Introduction

The Republic of Montenegro belongs to the pioneer countries protecting macromycetes by law. The plant species including the macromycetes have to be protected by the current laws: The Law on Environment (1996), The Law on Nature Protection (1977/1989), The Law on Forests (1955/2000). However, this is the first list of fully protected macromycetes in Montenegro ("Official Gazette of RM", No. 76/06). By now only plants and animals were totally protected in Montenegro (314 animal and 57 plant species have been protected by a special Decision on protection of rare, endemic and endangered

animal and plant species, 1982), because the macromycetes have been studied for a relatively short time period and knowledge about distribution has been scarce. The list of mushroom species of that could be used for commercial purpose is declaimed by The Law on Forests.

In the last 15 years the study of macromycetes in Montenegro has become more intensive and systematic. The number of identified species in 1997 was 569 (Perić & Perić, 1997). Since this year 351 species (Hadžić, 1995; Kasom 2003, 2004, 2006; Perić & Perić, 1998, 1999, 2002-2006 and Perić, Perić, & Perić 2000) could be added to this list. In combination with the existing literature data a total of 920 fungi species have been recorded in Montenegro up to now. A main part of them are rare in other countries as well as in Montenegro. Complying with recent efforts to catalogue the mycological records and in combination with the knowledge on rare and threatened species in Europe, it is possible to make a list of species for protection. The list is an open working document aimed at offering to definite estimation.

Tab. 1 Review of species (Ascomycotina and Basidiomycotina) according to taxonomical categories in Montenegro

Subsections		No of species
Ascomycotina		152
Basidiomycotina		768
	Agaricales	321
	Aphyllorphorales	221
	Boletales	69
	Russulales	91
	Gasteromycetes	47
	Phragmobasidiomycetidae	19
Total		920

Resultants and discussion

The basic criteria for the categorisation of important species as a part of biodiversity are from international obligations of Montenegro State on one side and national obligations on there other side. International obligations concern activities to protect and conserve species of global importance. The national obligations are needs of the state to protect biodiversity, the national nature heritage including populations in typically habitats.

The List of protected species of macromycetes in Montenegro has been elaborated according to the following criteria:

- Presence of the species on the European Red List, groups A, B, C and D (Ing, 1993), and which are - in addition- rare or endangered in Montenegro;
- Species which are included in ECCF Project “Mapping and monitoring of threaten fungi in Europe” (50 threatened fungal species, including all 33 species candidates for listing in Appendix 1 of the Bern Convention - 2001), and which - in addition - are rare or endangered in Montenegro;
- Species which are very rare or rare in Montenegro;
- Species which are very rare or rare in Montenegro, and endangered because of excessive exploitation;

- Species with a locus classicus in Montenegro;
- Species confined to rare or endangered habitats and substrates.

The species categorisation according to the IUCN categories could not have been entirely applied for the time being as the region is insufficiently investigated. In our country we can use the same categorisation as in the Republic of Macedonia because the situation concerning the knowledge on distribution and ecology of macromycetes is similar (Karadelev, 2000).

The categorisation of endangered species is as follows:

- Very rare or rare species in Montenegro -EKSP;
- Species confined to endangered or rare habitats - RV;
- Very rare or rare species in Montenegro endangered because of excessive exploitation - RS.

A total of 111 protected species of macromycetes in Montenegro are on the List. The number of species belonging to subsection Basidiomycotina is 98 and 13 species are from subsection Ascomycotina. The numerous protected species have international level of importance.

The present list of protected species in Montenegro has the following background:

- 94 species are from the European Red List.
- 12 species are from the List of the ECCF Project “Mapping and monitoring of threaten fungi in Europe” in Montenegro, from which four species (*Bovista paludosa*, *Gomphus clavatus*, *Sarcosphaera coronaria*, *Suillus sibiricus subsp. helveticus*) are candidates for listing in Appendix 1 of the Bern Convention.
- Additional species are protected because their locus classicus are in Montenegro (*Gyromitra mcknightii*), or that species are very rare or rare in Montenegro and species which exist in endangered or rare habitats.

In some cases some species have been proposed because of more than one reason.

The number of species within the mentioned categories is the following:

- 92 are very rare or rare species in Montenegro (EKSP);
- 1 species is confined to endangered or rare habitats (RV);
- 18 are very rare or rare species in Montenegro endangered because of excessive exploitation (RS).

Tab. 2. List of macromycetes species (Basidiomycotina and Ascomycotina) protected in the Republic of Montenegro

MNE (Montenegro): EKSP – very rare or rare species in Montenegro; RV – species confined to endangered or rare habitats in Montenegro; RS – very rare or rare species in Montenegro, endangered because of excessive exploitation.

ERL – species from European Red List (Ing, 1993) groups A, B, C, D;

ECCF – species from ECCF Project “Mapping and monitoring of threaten fungi in Europe” - 50 threatened fungal species, including all 33 species candidates for listing in Appendix 1 of the Bern Convention (2001);

BERN – candidates for listing in Appendix I of the Bern Convention.

Species	MNE	ERL	ECCF
<i>Albatrellus ovinus</i> (Schaeff.) Murrill	EKSP	D	
<i>Albatrellus pes-caprae</i> (Pers.) Pouzar	EKSP	D	

<i>Aleurodiscus disciformis</i> (Vill.) Pat.	EKSP	B	
<i>Amanita aspera</i> (Fr.) Gray	EKSP	C	
<i>Amanita caesarea</i> (Scop.) Pers.	RS	D	+
<i>Amanita solitaria</i> (Bull.) Mérat	EKSP		
<i>Amanita vittadinii</i> (Moretti) Vittad.	EKSP		
<i>Boletus aereus</i> Bull.	RS	C	
<i>Boletus appendiculatus</i> Schaeff.	RS	C	
<i>Boletus fechtneri</i> Velen.	RS	B	
<i>Boletus impolitus</i> Fr.	RS	B	
<i>Boletus queletii</i> Schulzer	RS	B	
<i>Boletus radicans</i> Pers. Syn.: <i>B. albidus</i> Roques	RS	C	
<i>Boletus regius</i> Krombh.	RS	A	
<i>Boletus rhodoxanthus</i> (Krombh.) Kallenb.	RS	A	
<i>Boletus satanas</i> Lenz	RS	A	
<i>Boletus torosus</i> Fr.	RS	D	
<i>Bovista paludosa</i> Lév.	EKSP	B	BERN
<i>Caloscypha fulgens</i> (Pers.) Boud.	EKSP	C	
<i>Cantharellus cinereus</i> (Pers.) Fr.	RS	C	
<i>Cantharellus friesii</i> Quél.	RS		
<i>Catathelasma imperiale</i> (Fr.) Singer	EKSP	B	
<i>Clavariadelphus truncatus</i> (Quél.) Donk	EKSP	D	
<i>Coltricia cinnamomea</i> (Jacq.) Murrill.	EKSP	C	
<i>Cortinarius bulliardii</i> (Pers.) Fr.	EKSP	B	
<i>Cortinarius orellanus</i> Fr.	EKSP	C	
<i>Cortinarius praestans</i> (Cordier) Sacc.	EKSP	C	
<i>Cortinarius violaceus</i> (L.) Fr.	EKSP	B	
<i>Cudonia circinans</i> (Pers.) Fr.	EKSP	C	
<i>Ganoderma resinaceum</i> Boud. in Pat.	EKSP	C	
<i>Geastrum fimbriatum</i> Fr.	EKSP		
<i>Geastrum coronatum</i> Pers.	EKSP	C	
<i>Geastrum fornicatum</i> (Huds. ex Pers.) Hook.	EKSP	A	
<i>Geastrum quadrifidum</i> Pers. ex Pers.	EKSP	C	
<i>Geastrum minimum</i> Schwein.	EKSP	C	
<i>Geastrum pectinatum</i> Pers.	EKSP	C	
<i>Geastrum schmidelii</i> Vitt. syn.: <i>G. nanum</i> Pers.	EKSP	B	
<i>Geastrum striatum</i> DC.	EKSP	C	
<i>Geoglossum umbratile</i> Sacc. syn.: <i>G. nigrum</i> Cooke	EKSP	C	
<i>Gomphidius maculatus</i> (Scop.) Fr.	EKSP	C	
<i>Gomphus clavatus</i> (Pers.) Gray	EKSP	A	BERN
<i>Gyroporus cyanescens</i> (Bull. ex Fr.) Quél.	EKSP		
<i>Gyrodon lividus</i> (Bull.) Fr.	RV		
<i>Gyromitra gigas</i> (Krombh.) Cooke	RS	C	
<i>Gyromitra mcknightii</i> Harmaja	EKSP		
<i>Helvella atra</i> Holmsk.	EKSP		+
<i>Hericium clathroides</i> (Pall.) Pers.	EKSP	C	
<i>Hydnellum aurantiacum</i> (Batsch.) P. Karst.	EKSP	B	
<i>Hydnellum caeruleum</i> (Hornem.) P. Karst.	EKSP	B	

<i>Hydnellum conrescens</i> (Pers.) Banker	EKSP	C	
<i>Hydnellum ferrugineum</i> (Pers.) P. Karst.	EKSP	A	
<i>Hydnellum peckii</i> Banker	EKSP	B	
<i>Hydnellum suaveolens</i> (Scop.) P. Karst.	EKSP		+
<i>Hygrocybe citrinovirens</i> (J. E. Lange) Jul. Schäff.	EKSP		
<i>Hygrocybe intermedia</i> (Pass.) Fayod	EKSP	C	
<i>Hygrocybe obrussea</i> (Fr.) Wünsche	EKSP	C	
<i>Hygrocybe ovina</i> (Bull.) Kühner	EKSP	B	
<i>Hygrocybe punicea</i> (Fr.) P. Kumm.	EKSP	C	
<i>Hygrocybe spadicea</i> (Scop.) P. Karst.	EKSP	A	
<i>Hygrocybe subglobispora</i> (P. D. Orton) M. M. Moser	EKSP	C	
<i>Hygrophorus gliocyclus</i> Fr. Syn.: <i>H. ligatus</i> auct.	EKSP	C	
<i>Hygrophorus hypothejus</i> (Fr.) Fr.	EKSP	C	
<i>Hygrophorus marzuolus</i> (Fr.) Bres.	EKSP	D	+
<i>Hygrophorus nemoreus</i> (Pers.) Fr.	EKSP	C	
<i>Hygrophorus poetarum</i> R. Heim	EKSP	D	
<i>Hygrophorus russula</i> (Schaeff.) Quél.	EKSP	B	
<i>Hymenochaete cruenta</i> (Pers.) Fr.	EKSP		+
<i>Lactarius acris</i> (Bolton) Fr.	EKSP	C	
<i>Lactarius controversus</i> (Pers.) Fr.	EKSP	C	
<i>Lactarius mairei</i> Malençon	EKSP	B	
<i>Lactarius musteus</i> Fr.	EKSP	B	
<i>Lentinus adhaerens</i> (Alb. et Schwein.) Fr.	EKSP	C	
<i>Lepiota grangei</i> (Eyre) J. E. Lange	EKSP	C	
<i>Limacella glioderma</i> (Fr.) Maire	EKSP	C	
<i>Limacella guttata</i> (Pers.) Konrad & Maubl.	EKSP	C	
<i>Lycoperdon mammiforme</i> Pers.	RS	C	
<i>Mitrophora semilibera</i> (DC.) Lév.	EKSP		
<i>Morchella rotunda</i> (Pers.) Boud.	RS		
<i>Mutinus caninus</i> (Huds.) Fr.	EKSP	C	
<i>Omphalotus olearius</i> (DC.) Singer	EKSP	C	
<i>Onnia tomentosa</i> (Fr.) P. Karst.	EKSP	B	
<i>Onygena equina</i> (Willd.) Pers.	EKSP	C	
<i>Otidea concinna</i> (Pers.) Sacc.	EKSP	C	
<i>Phellodon niger</i> (Fr.) P. Karst.	EKSP	B	
<i>Phellodon tomentosum</i> (L.) Banker	EKSP	B	
<i>Phylloporus rhodoxanthus</i> (Schwein.) Bres.	EKSP		+
<i>Pisolithus arhizus</i> (Scop.) Rauschert	EKSP	C	+
<i>Polyporus umbellatus</i> (Pers.) Fr.	EKSP	B	
<i>Porphyrellus porphyrosporus</i> (Fr.) J.-E. Gilbert	EKSP	C	
<i>Porphyrellus pseudoscaber</i> (Secr.) Singer	EKSP	C	
<i>Ramaria botrytis</i> (Fr.) Ricken	EKSP	C	
<i>Ramaria formosa</i> (Pers.) Quél.	EKSP	C	
<i>Sarcodon imbricatus</i> (L.) P. Karst.	EKSP	C	
<i>Sarcodon joeides</i> (Pass.) Bat.	EKSP	D	
<i>Sarcodon leucopus</i> (Pers.) Maas Geest. & Nannf.	EKSP	C	
<i>Sarcodon scabrosus</i> (Fr.) P. Karst.	EKSP	B	

<i>Sarcosphaera coronaria</i> (Jacq.) J. Schröt.	EKSP		BERN
<i>Sparassis laminosa</i> Fr.	EKSP	C	
<i>Strobilomyces strobilaceus</i> (Scop.) Berk. Syn. <i>S. floccopus</i> (Vahl) P. Karst.	EKSP	C	+
<i>Suillus luteus</i> (L.) Gray	RS		
<i>Suillus sibiricus</i> Singer subsp. <i>helveticus</i> Singer	EKSP		BERN
<i>Trametes suaveolens</i> (L.) Fr.	EKSP	C	
<i>Trichoglossum hirsutum</i> (Pers.) Boud.	EKSP	C	
<i>Tricholoma acerbum</i> (Bull.) Quéf.	EKSP	B	
<i>Tricholoma aurantium</i> (Schaeff.) Ricken	EKSP	B	
<i>Tricholoma sejunctum</i> (Sowerby) Quéf.	EKSP	C	
<i>Tricholoma squarrulosum</i> Bres.	EKSP	B	
<i>Tulostoma brumale</i> Pers.	EKSP	C	
<i>Tulostoma fimbriatum</i> Fr.	EKSP	C	
<i>Verpa conica</i> (O. F. Müll.) Sw.	RS	C	
<i>Volvariella bombycina</i> (Schaeff.) Singer	EKSP	C	

Acknowledgements

Gordana Kasom would like to express gratitude to prof. Dr Mitko Karadelev (Faculty of Natural Sciences and Mathematics, Skopje, Republic of Macedonia) for his suggestion and professional assistance and Dr Peter Otto (University of Leipzig, Systematic Botany, Germany) for his help and support during her stay in Germany.

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October 2006