The role of the ECCF in studies and conservation of fungi in Europe

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Abstract. The European Council for the Conservation of Fungi (ECCF) promotes and co-ordinates efforts for protection of fungi in Europe. Activities over the last 19 years are summarised. The ECCF is seen as a link between research and practice, with provision of information as its most important task. Current projects include European-level mapping of selected species and a European Red List of larger fungi. Examples from various countries are given of conservation strategies (e.g. monitoring, mapping, selection of Important Fungus Areas), public relations (protected species, flagship species, species of the year), and management guidelines for macromycetes.

Key words: conservation of fungi, conservation strategies, European Council for the Conservation of Fungi, mapping, Red lists

History of ECCF

Long before the Convention on Biological Diversity appeared on international agendas, European mycologists worried about a decline in certain fungal species. The effects of acid rain deposition and the subsequent forest die back in many parts of Europe made it clear that fungi were being affected. Arnolds (1985a, b) was among the first to report about changes in the mycota within one country, the Netherlands. The increase in rarity, especially of mycorrhizal fungi, was found to be correlated with changes in the herb layer, especially of forests, and a decline of tree vitality. To gather more information about this apparently changing mycota and its reasons, and to form a strong pressure group for the conservation of fungi, mycologists from several European countries decided to found a common platform: the ECCF (European Council for the Conservation of Fungi) was established at the 9th European Congress of Mycologists (CEM) in Oslo in 1985 with the task to promote and co-ordinate studies and publications on protection of fungi and to promote effective measures in this respect. As a first action a questionnaire on the decline and protection of macrofungi was sent to committee members or preliminary committee members in 19 European countries.

Under the guidance of Anna Elise Jansen as the first president, a subsequent meeting in Poland made it clear, that a strong decline of formerly widespread and common fungi was being observed in many parts of Europe (Jansen & Lawrynowicz 1991). Decline was reported in both saprotrophic and mycorrhizal fungi, but representation of mycorrhizal fungi was disproportionately high in the declined fungi group. First Red Lists published between 1984 and 1988 listed 136 genera and, in some regions such as Saarland, 50 % of all macromycetes.

Since then, meetings of the ECCF have been held annually or biennially (see Tab. 1) in various parts of Europe, always organised by local hosts, and every meeting with 20 to 30 participants. Today delegates currently represent nearly 40 countries.

During the nineties conservation of biological diversity became a major issue on political agendas with the Rio Convention (1992) as a strong, and powerful initiative. New questions arose where mycological expertise was needed. Alongside national interests, European-level questions arose. Which species are of European importance? Where are Europe's hotspots of fungal diversity? Is it possible to designate important areas for fungi? What management policies promote fungi?

Table 1. Meetings of the ECCF in chronological order

1985 – September, Oslo, Norway, Congress of European Mycologists
1988 – August 11-13, Lodz, Poland
1989 – August, Tallin, Estonia, Congress of European Mycologists
1990 – September, Regensburg, Germany, 5th International Mycological Congress
1991 – September 13-18, Vilm, Germany
1992 – September, Kew, United Kingdom, Congress of European Mycologists
1993 – September 17-22, Le Louvrin, Switzerland
1995 – September, Wageningen, The Netherlands
1997 – September 9-14, Vipiteno (Bressanone), Italy
1999 – September, Alcala De Henares (Madrid), Spain, Congress of European Mycologists
2001 – August 28-September 1, Oulanka (Kuusamo), Finland
2002 – August, Oslo, Norway, 7th International Mycological Congress
2003 – September, Katsiveli, Ukraine, Congress of European Mycologists

Present activities of the ECCF

Information as an activity of the ECCF

Exchange of information about national initiatives in fungal conservation is seen as the prime task of the ECCF. To facilitate this goal a website (www.eccf.info) and an internet forum have been launched. To post a message to all listed members, an e-mail should be sent to eccf@seiti-lists.univ-lille2.fr.

Information about the various conservation activities, i.e. red listing, mapping, and national legal measurements, are distributed in a newsletter edited by Claudia Perini and, since 2003 starting with issue 13, by Beatrice Senn-Irlet. Many can be downloaded through the ECCF-website.

In addition proceedings have been published from three meetings (Jansen & Lawrynowicz 1991; Arnolds & Kreisel 1992; Perini 1998).

Mapping on a European scale as an activity promoted by the ECCF

Reliable data about threatened fungi, especially of their distribution and ecology are needed to improve conditions for their conservation. Knowledge about distribution at a European level is essential if species with narrow ranges or for which conservation is the responsibility of a single country are to be identified. The work of Lange (1974) was a very early attempt to show distribution patterns on a European scale: 50 species were analysed.

As a cartographic basis the UTM system has been chosen, i.e. maps with a grid of 50 × 50 km using software from other similar projects such as "Atlas Florae Europaeae".

A pilot series of macromycetes maps again contains 50 species, including those proposed for the appendix of the Bern Convention.

Species selected for mapping should be taxonomically well-defined with easily visible fruit-bodies, sporulating more or less regularly. Species known only from Europe or Eurasia are preferred. The species should include representatives from different floristic regions and vegetation types of Europe, fitting the concept of the EU habitat initiative. The organisation of this project is with Peter Otto from Leipzig.

The practical importance of a European mapping for conservation: the case of Lyophyllum favrei (see box)

Compilation of national data on distribution and ecology of 33 threatened species for the Bern Convention (Dahlberg & Croneborg 2003) revealed that *Lyophyllum favrei,* a species first described from Switzerland in 1950, has its centre of distribution in Switzerland. No other European country, regardless of its size, has such a high number of known localities for this fungus. In terms of national responsibilities for this species, Switzerland therefore has a leading role. At a national level (Fig. 3) the distribution map (see www.swissfungi.ch) reveals a striking pattern: all localities are in the neighbourhood of rivers flowing north from the Alps, i.e. north of the continental watershed. The habitat is best described as alluvial forests in transition to beech forest. Furthermore the map shows that all localities are situated in densely populated areas which are under permanent stress from human impact. This is also documented at the local scale (Fig. 4): at this example locality an autobahn exit leads directly to a local recreation area along the river. New dams for flood protection, a pump station for drinking water, road works, additional parking space, trampling, and over-fertilisation by dogs are current threats to this site. Only joint efforts from national, regional and local authorities together with the landowner will help to conserve the several populations of *Lyophyllum favrei* on this site.

Fig. 1. *Lyophyllum favrei,* fresh fruit-bodies

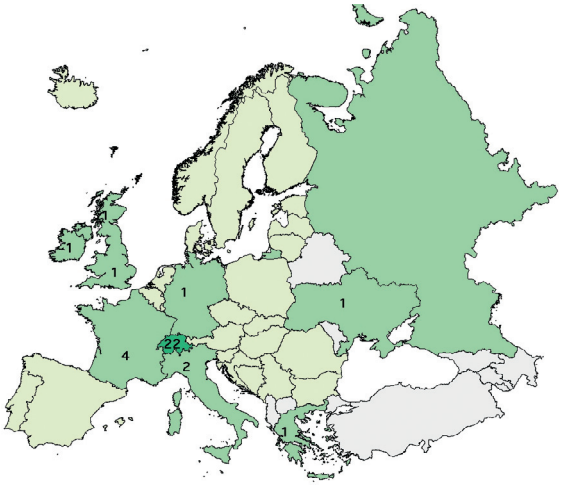

Fig. 2. European scale: status of *Lyophyllum favre*i in Europe: grey = no data, pale greenish = not present, green = 1-5 localities, strong green > 6 localities

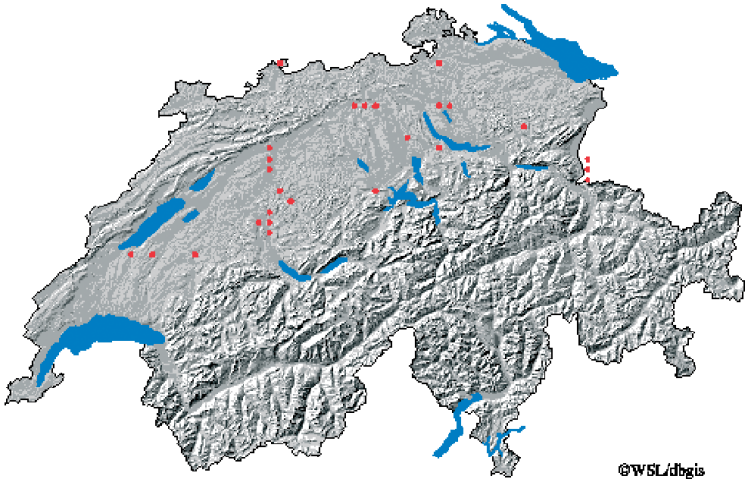

Fig. 3. National scale: Map of Switzerland and Liechtenstein with the known sites of *Lyophyllum favrei* as of July 2004

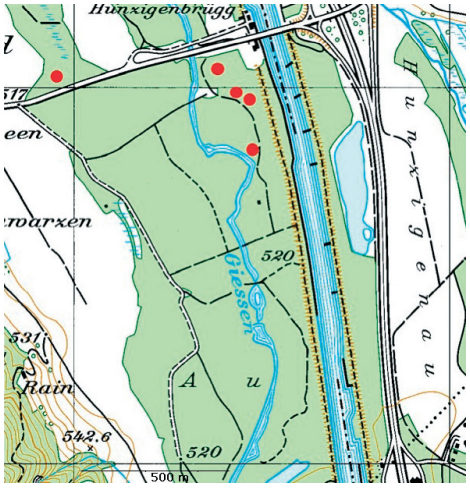

Fig. 4. Local scale. Populations of *Lyophyllum favrei* South of Bern, Switzerland in a 1-km grid

Scales of biodiversity and their underlying processes: the case of macromycetes in Switzerland

A prerequisite to meet one requirement of the Convention on Biological Diversity is scientific knowledge as a base for conservation efforts. Therefore well-designed programmes are needed to cover the various aspects of biodiversity (Weber *et al.* 2004).

National checklists document the wealth of species which each country can claim as a natural heritage. Such lists can provide long-term information about species extinctions and new colonisations especially if historical documents from former centuries are analysed. The total species number is mainly influenced by climate and geology, and in addition by presence of mountainous areas. Regional checklists or national distribution maps on a macro-scale will provide information about between-region-diversity. Regions with extraordinarily high species richness or a set of otherwise very rare species can be selected on this macro-scale, an important tool for setting priorities in management programmes. Moreover, trends for invasive species can be estimated.

Local checklists, and regional Red Lists contain information about within-habitat-mosaic-diversity. They are defined on the base of distinct dominating vegetation, climatic or geological units. The size and the distribution of different land use types within this region become the most important factors explaining processes in species changes on this landscape-scale. For most species the area size is large enough to maintain healthy populations. Conservation efforts with management programmes will be most effective at this scale. Very specific local populations will probably still diminish or even get lost, but the chances are that stands with similar conditions will improve if protected.

A third spatial scale may be called local. It is best defined as a stand with some within-stand-diversity. It may cover areas of some 10 to 100 m². Human impact results from various land use techniques. Local checklists will describe hot spots,

small areas with high species diversity or the presence of many rare species. They are often best characterized by a striking uniqueness. Even if the population sizes may often be too small to guarantee a long-term survival, such sites may act as a "flagship" for conservation efforts on a regional scale.

To illustrate the dimensions of species richness of macromycetes at different scales, an example from the Swiss mapping project is presented in Fig. 5. The basic survey area consists of a transect of 100 × 2 m, which was visited for macromycetes four times during a single fruiting period. Four such strips characterize one forest stand and ten such stands, each investigated in the same way, characterize one landscape (for methods see Senn-Irlet *et al.* 2003). While small stands, i.e. one transect, exhibit on average 33 species, four transects revealed on average 91 species and, at landscape level 334 species, each level showing considerable variation.

Yet, in Switzerland with an area size of 42 000 km² a total of 5600 species is reported which may be classified as macromycetes illustrating the huge task for fungal ecologists to understand all the processes behind this diversity.

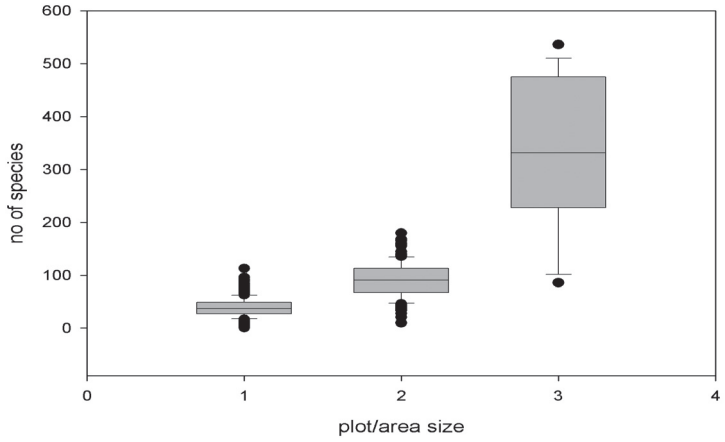

Fig. 5. Species richness at different scales: results from a standardized survey in transects of (1) 100 × 2 m, (2) of four transects starting from one spot, 800 m², and (3) ten such spots randomly distributed in an area of 50 × 50 km²

The European Red List of macrofungi as an activity launched by the ECCF

A European Red-List of macrofungi has, among other main topics, been on the agenda since the ECCF's beginning in Oslo during the European Congress in 1985. The publication by Bruce Ing (Ing 1993) was a first attempt by a small number of mycologists in this direction; it was the result of collaboration which started during the ECCF meeting at Vilm, Germany, in September 1991. The completion of a report on 33 threatened fungi for the Bern Convention during the last two years and in particular during spring 2003 revealed a tremendous amount of mycological knowledge, enthusiasm and activity in most European countries.

This report on 33 threatened fungi leads to a realistic hope that in the near future a European Red List project can be launched. Mycologists at the Swedish Species Information Centre have already designed a project with plans to circulate a questionnaire gathering all official and unofficial Red Lists of larger fungi from all European countries. In those countries where no such lists exist, the national mycological organisation or professional mycologists will be asked to suggest tentative fungi as candidates for a European Red List of Larger Fungi. After the available information has been compiled into a compact form, representatives from all interested member countries will be invited to workshops with the aim of harmonizing habitat categorization, evaluating local threats and setting priorities.

Conservation strategies

Monitoring

To detect changes in ecosystems any variable which can be readily measured and dated may be valuable. Non-lichenized fungi have up to now only rarely been used for monitoring purposes. The short life-span of fruit-bodies and absence of fruit-bodies at some localities for several years gave macromycetes the reputation of being organisms unsuitable for monitoring programmes aimed at detecting environmental change. If goals are clearly defined, however, macromycetes too can be used as will be shown with two examples.

Monitoring one species, Amanita muscaria, an example from the Netherlands

In the Netherlands the Royal Netherlands Society for Natural History has chosen the fly-agaric, *Amanita muscaria* (L.) Hook., for a country-wide monitoring with a 9 year-interval. This species is not threatened in the Netherlands, however as an easy recognisable, well-known organism it may serve as a symbol for the awareness of fungal biodiversity and the awareness of fungi as a group of organisms also in need of special conservation efforts. A broad campaign was started

in all kinds of different media. Naturalists from all over the country were asked to send information about observed fruit-bodies of *A. muscaria* during one season (van Tweel 2002). Beside the notation of the exact locality, information about the most probable host tree at this site was gathered. The result was overwhelming; more than 2500 contributors were counted. The results are summarized in Tab. 2. In 1991 the number or records was higher and the area, expressed by the number of grid units of 1 km² was larger than in 2000. The species has been observed again in less than half of the spots, again expressed as the pooled records in one 1 km² grid unit. The clear distribution pattern, proposed as a result of the national mapping program by the Dutch Mycological Society (Nauta & Vellinga 1995), i.e. acidic sandy areas, was confirmed. Astonishing was the observation that *A. muscaria* showed a remarkable shift in the host tree preference. In 1991 the fungus has been found overwhelmingly with birch and not with oak. In 2000 birch was still the preferred host but much less so, and oak had become another important host.

The scientific interpretation of this simple monitoring remains difficult. The project's aim, to make people aware of fungi, their beauty, their life-forms and special responses to weather, soil conditions and host tree diversity, was however roundly achieved. Long-term monitoring must be supported by administrative continuity otherwise the programme may simply be overlooked or forgotten (Spellerberg 1993). That simple rule was followed in this case: the data gathered was forwarded to the national centre of biogeography where all spatial data on fungi are stored.

Table 2. Results of a monitoring project with *Amanita muscaria* in the Netherlands

	Year	
	1991	**2000**
No of records	10 374	7526 (with 70 980 fruit-bodies)
No of 1 × 1 km grids	5122	3351
Records in the same grid	1540 (= 45 %)	
Host / tree ratio *Quercus* / *Betula*	1:12	1:2

Monitoring the most frequent species – results from mapping in Switzerland

If a regional mapping project implies recording on more or less fixed excursion routes with a fixed group of enthusiastic amateur mycologists over several years, then the apparently simple mapping project will also include monitoring aspects. This is the case in the region of NW Switzerland. Almost weekly excursions during the last four years into an area of about 990 km² in the Jura Mountains south of Basel dominated by beech and beech-fir-spruce forests on limestone yielded a total of 20 190 records of macromycetes (Senn-Irlet *et al.* 2004). This dataset (Tab. 3) was analysed for the abundance and the frequency of the Agaricales, Boletales and Russulales. Three ectomycorrhizal species and four wood-inhabiting species were among the seven most abundant and most frequent species.

A clear effect of the exceptionally dry-hot summer 2003 became visible: in this vegetation period distinctly fewer species were found and those species still fruiting showed a more equal distribution. Wood-inhabiters became the dominant species encountered.

Important Fungus Areas (IFA) – an example from the United Kingdom

Two trends exist to protect specific organisms, one focuses on individual species protection, the other on habitat and site protection. The latter implies the existence of local checklists, of regional and national distribution data to select specific areas with an outstanding mycota.

The United Kingdom has a long tradition in recording identified fungi, dating back at least to 1899. More than 2 million records have been accumulated since, forming a viable database for selection of important habitats.

A set of criteria has been defined to guarantee an objective selection process (see Tab. 4), which include rarity and high species richness based on database knowledge as well as traditional recognition of uniqueness of some sites. For the latter recommendations by mycologists through questionnaires, letters and direct approaches have been searched for (Evans 2002). Applying all these criteria, which follow the guidelines to the selection of Important Plant Areas in Europe (Palmer & Smart 2001; Anderson 2002), more than 500 sites have been selected to present the best-recorded sites in UK. However, more than 50 % of these selected sites are nominated by criterion D, i.e. a site considered important without scientific support from the database.

As an example of a possible IFA site in the UK, Epping Forest (Essex) in England is presented (Plantlife, British Mycological Society 2001), a relict pasture woodland with many veteran broad-leaved trees, a site of rare or threatened species. The mycological records for this classic site dates back for 120 years. *Gomphus clavatus* is one of the species with no recent record, the last dates back in 1924. Another possible IFA site is Garn-Ddyrys, Blorenge (Powys) in Wales, unimproved upland grassland with many *Hygrocybe* species on a relatively small area. The area is already part of the Blaenavon World Heritage Area, known for its industrial archaeology.

An important aspect of the selection of IFAs is that it rises the profile of fungi beyond the limits of the mycological community.

Table 3. The 10 most frequently observed macromycetes in the years 2000-2003, with indications of the number of records per species and its rank position

Life forms: w = wood-inhabiting species, e = ectomycorrhizal species, l = litter saprotrophic species

	Life form	Year			
		2000	**2001**	**2002**	**2003**
Total # of records		4465	5562	7040	3143
Total # of species		747	874	904	582
Hypholoma fasciculare (Huds.) Quél.	w	55 (5.)	44	97 (4.)	67 (1.)
Megacollybia platyphylla (Pers.) Kotl. & Pouzar	w	59 (4.)	82 (4.)	101 (3.)	54 (2.)
Collybia dryophila (Bull.) P. Kumm.	l	23	40	46	42 (3.)
Pluteus cervinus P. Kumm. *aggr.*	w	20	31	39	40 (4.)
Marasmius alliaceus (Jacq.) Fr.	w	16	20	31	37 (5.)
Kühneromyces mutabilis (Schaeff.) Singer & A.H. Sm.	w	42 (9-10.)	34	64 (10.)	36 (6.)
Armillariella mellea (Vahl) P. Kumm. *aggr.*	w	33	21	16	34 (7-8.)
Mycena galericulata (Scop.) Gray	w	26	31	21	34 (7-8.)
Oudemansiella radicata (Relhan) Singer	w	40	63 (5-6.)	74	32 (9-10.)
Russula olivacea (Schaeff.) Fr.	e	98 (1.)	95 (2.)	92 (5.)	32 (9-10.)
Russula cyanoxantha (Schaeff.) Fr.	e	80 (3.)	123 (1.)	142 (1.)	20
Amanita rubescens (Pers.) Gray	e	36	89 (3.)	103 (2.)	18
Clitopilus prunulus (Scop.) Fr.	e	88 (2.)	46 (10.)	79 (6.)	6
Collybia confluens (Pers.) P. Kumm.	l	52 (6.)	37	70 (7.)	17
Lactarius piperatus (L.) Pers.	e	33	63 (5-6.)	68 (8.)	18
Lactarius salmonicolor R. Heim & Leclair	e	42 (9-10.)	32	65 (9.)	18
Boletus edulis Bull.	e	35	50 (7.)	47	14
Boletus luridus Schaeff.	e	10	49 (8.)	39	5
Clitocybe gibba (Pers.) P. Kumm.	l	34	48 (9.)	63	28
Mycena pura (Pers.) Sacc.	l	46 (7.)	39	62	22
Russula integra (L.) Fr.	e	43 (8.)	35	37	21
Lactarius deterrimus Gröger	e	37	25	44	13

Table 4. Proposal for the selection of Important Fungus Areas in the UK. Criteria and number of sites selected

Criterion	**# of sites selected**			
		A & B	A, B & C	B & C
A: the site holds significant populations of rare fungi species which are of European or UK conservation concern	38	40	15	5
B: the site has an exceptionally rich and well-recorded mycota of a UK interest (at least 500 recorded species)	50			
C: a site which is an outstanding example of a habitat type of known mycological interest	70			
D: a nominated site which is considered to be important but for which further information is needed	282			

PR strategies

Protected species – an example from Switzerland

A decree of a federal law about nature and homeland conservation from 2000 lists together with some plants and animals 12 fungal species. Picking, selling or destroying of these species is prohibited. Local authorities are committed to impose this regulation. Regional authorities are bound to enlarge the list with regionally or locally threatened species.

The criteria for the selection of these 12 species include morphological characteristics such as showy fruit-bodies which are easy and unequivocal to identify, ecological characteristics such as a strict host dependency or presence in highly endangered habitats and political considerations, i.e. a somewhat equal distribution of the localities throughout the country.

The advantages are obvious. These species profit from a clear legal protection and a broad acceptance by the public and various authorities. Non-governmental organisations may accompany and monitor the implementation and the execution.

Protected species should mainly symbolize the high value of the national nature heritage. Most frequently, protected species also feature in Red Lists.

Table 5. List of protected fungi in Switzerland

Boletus regius Krombh.
Clavaria zollingeri Lév.
Hygrocybe calytriformis (Berk. & Broome) Fayod
Laricifomes officinalis (Vill.) Kotl. & Pouzar
Lyophyllum favrei (R. Haller Aar. & R. Haller Suhr) R. Haller Aar. & R. Haller Suhr
Pluteus aurantiorugosus (Trog) Sacc.
Sarcodon joeides (Pass.) Bat.
Squamanita schreieri Imbach
Suillus plorans (Rolland) Kuntze
Tricholoma caligatum (Viv.) Ricken s. lat.
Tricholoma colossus (Fr.) Quél.
Verpa conica (O.F. Müll.) Sw.

Signal species – an example from Sweden

In Sweden an informative book was published (Nitare 2000) illustrating together with lichens and mosses 130 fungi, which have been designated as indicator species mainly of forest stands worthy of conservation. Selection of species is based on whether they are known to occur mainly in sites holding endangered species, or to species restricted to certain substrata or habitats rarely found in woodland landscape, and to species known as poor colonizers which are restricted to aged habitats or old-growth forest stands.

Each species is illustrated with a coloured picture of excellent quality and by a short morphological description, a distribution map, an enumeration of known habitat types (out of a classification with 22 different types) and its status on the Red List.

Table 6. Selected examples from signal species

Catathelasma imperiale (Fr.) Singer
Clavariadelphus truncata (Quél.) Donk
Clavicorona pyxidata (Pers.) Donk
Coprinus picaceus (Bull.) Gray
Cortinarius percomis Fr.
Hapalopilus croceus (Pers.) Donk
Hydnellum aurantiacum (Batsch) P. Karst.
Inonotus dryadeus (Pers.) Murrill
Irpicodon pendulus (Alb. & Schwein.) Pouzar
Lactarius volemus (Fr.) Fr.
Laurilia sulcata (Burt) Pouzar
Oxyporus corticola (Fr.) Ryvarden
Ramariopsis pulchella (Boud.) Corner
Sarcosoma globosum (Schmidel) Rehm

Fungus of the year – an example from Germany

In various groups such as birds and plants, selection of an "organism of the year" by a non-governmental organisation has already a tradition of more than 30 years. The German Mycological Society decided ten years ago to join this initiative by promoting each year one selected fungal species. This species should exemplify the importance of fungi in ecosystems. Therefore the criteria for selection are not so much based on rarity or acute threat of a specific species but more on value as a representative of a specific habitat type or of traditional use by humans. So, *Serpula lacrymans,* the fungus of the year 2004 should emphasize its underestimated economic importance.

Illustrations and information about the selected fungus are distributed via the internet (see http://www.dgfm-ev.de/www/de/start/index.php3). In addition postcards are available.

Table 7. Fungi of the Year presented by the German Mycological Society since 1994

2004: *Serpula lacrymans* (Wulfen) J. Schröt.
2003: *Hygrocybe psittacina* (Fr.) Fr.
2002: *Cortinarius orellanus* Fr.
2001: *Choiromyces maeandriformis* Vittad.
2000: *Amanita regalis* (Fr.) Michael
1999: *Boletus satanas* Lenz
1998: *Gomphus clavatus* (Pers.) Gray
1997: *Russula cyanoxantha* (Schaeff.) Fr.
1996: *Sarcodon imbricatus* (L.) P. Karst.
1995: *Fomes fomentarius*. (L.) J.J. Kickx
1994: *Leccinum quercinum* (Pilát) E.E. Green & Watling

Management guidelines: an example from the Netherlands

Conservation practice is often confronted with the need for detailed instructions for the management of a specific site or for specific organisms. For fungi hardly any recommendations exist except the demand for a general effective site protection. However, an interesting start for clear and specific instructions comes from The Netherlands. Common activities in land-management, gardening and urban planning are critically commented and classified as favourable or unfavourable with regards to specific fungal needs (Keizer 2003). Disturbance by civil engineering, various machines, parking, trampling, and disposal of organic material is seen in general as unfavourable, whereas removal of autumnal leaf litter and hay in urban areas, extensive grazing, confining exotic plants and especially a continuing identical management and cultivation treatment over many years may favour macromycetes.

Management guidelines may be especially useful in urban areas. In parks, and roadside verges the presence of large size logs and trunks will favour rare and interesting decomposers; an avoidance strategy for an accumulation of leaves, dead branches, and remains of pruning or wood chips will favour ectomycorrhizal fungi. Special care should be given to host trees known to harbour many ectomycorrhizal species such as oak and beech, whereas exotic host species or trees with arbuscular mycorrhizas such as maple or sycamore should be avoided as they are poor in fungi.

The principle of fungus-friendly forest management is to avoid disturbance. The forest structure should be multilayered, diverse in respect to host trees, in addition the groundwater-table should be left unchanged and coarse woody debris not removed.

The future: building networks

ECCF is best seen as a link between research and practice. A close co-operation with non-governmental organisations such as Planta Europa, IUCN species survival commission, Plantlife (UK), and national or regional amateur groups or mycological societies is of paramount importance.

The slowly accumulating huge amount of information about distribution and ecology of many fungal species throughout Europe requires a close attachment of mapping groups to national centres of spatial information or biogeography so that conservation authorities can profit from this knowledge. Only by linking the result of scientific projects, locally mandated inventories and mapping data as a recreational output of numerous amateurs, the conservation of fungi can be set on a sound scientific ground, a precondition for governmental actions.

For future activities the ECCF has joined forces with the recently established European Mycological Association (EMA, see http://www.euromould.org/index.htm) and will help this new Association to define clear goals and objectives. There are promising perspectives that the EMA will enforce the active role of ECCF in the conservation of fungi in Europe.

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