International Society for Fungal Conservation

At a special meeting on 6 August 2010 at the *Royal Botanic Garden, Edinburgh*, mycologists from over forty countries established the *International Society for Fungal Conservation*. For the conservation movement, this was an event of enormous and historical significance. Almost unbelievably, this new Society appears to be the first anywhere in the world exclusively and explicitly devoted to protecting fungi. The present note is a short account of how the Society came to be formed, and what it hopes to achieve. For information about how to join the Society, please visit its website (<fungal-conservation.org>).

Fungi: the orphans of Rio

The challenges for fungal conservation are daunting. As nature's recyclers, fungi are like municipal refuse collectors employed to take away our rubbish. We don't notice them until they go on strike. The well-being of fungi is necessary for sustainable life on this planet. Scientists have known for over 100 years that, like animals and plants, fungi too are affected by the destructive activities of mankind. The impact of air pollution on lichen-forming fungi is one particularly well documented example. Although there is still insufficient information about the conservation status of fungi, there is no reason to suppose that fungi are any less vulnerable than other groups of organisms to habitat loss and climate change. The topic is far too important to ignore.

Cryptomyces maximus: provisionally assessed globally as critically endangered. IUCN Species of the Day, 20 September 2010 (<iucnredlist.org/sotdfiles/cryptomyces-maximus.pdf>). Photo: David Harries.

Public awareness of their importance is, however, very low, not least because biodiversity - the full and wonderful diversity of life - is still widely portrayed as "flora and fauna" or "animals and plants". These are lazy and misleading descriptions. Those responsible include a range of major biological institutions and learned societies which should and do know better. The five kingdom classification of life, which recognizes fungi in a kingdom of their own, has been generally accepted by scientists since at least 1970.

The broader conservation movement, as a result, remains largely unaware of the need to conserve fungi. Priority habitats for conservation, such as biodiversity hotspots, are almost always defined on the basis of bird, mammal and flowering plant diversity. This means that habitats rich in fungal diversity are missed and remain unprotected. Most nature reserve management plans do not take fungi into account. Fungi (for example host-specific species known only on rare endemic plants) are often treated as part of the problem (a threat to the plant) rather than recognized as themselves being in need of protection. In many countries there is no explicit legal protection for fungi.

This failure to take fungi into account spilled over into the *Rio Convention on Biological Diversity* [CBD]. Laudibly, it claims to protect all forms of life, but its text defines biodiversity as "animals, plants and micro-organisms", i.e. two taxonomic kingdoms and a third category by size. Fungi belong in neither the animal nor plant kingdom and, as they include in their number the largest single living individual known on earth, far bigger than the blue whale or any of the great redwoods, they can hardly be described as micro-organisms. They simply do not fit any of the CBD categories. As a result, many national biodiversity action plans produced as a result of that convention fail to consider fungi at all. The few which do, treat them as "lower plants" - an obscure corner of botany. As David Hawksworth, one of the world's leading mycologists so eloquently put it, fungi are "the orphans of Rio".

Poronia punctata: provisionally assessed globally as vulnerable. IUCN Species of the Day, 21 August 2010 (<iucnredlist.org/sotdfiles/poronia-punctata.pdf>). Photo: David Minter

The start of the modern fungal conservation movement

Fungal conservation is in its infancy. The *European Council for Conservation of Fungi* (now the fungal conservation group of the *European Mycological Association*) was established in Oslo in 1985, and that event marked the start of the modern fungal conservation movement. Thereafter, specialist groups for "lichens" and "fungi" were set up in the *Species Survival Commission* of the *International Union for Nature Conservation* (IUCN), the *Australasian Mycological Society* formed a continental-level fungal conservation group, and the ground-breaking volume *Fungal Conservation: issues and solutions* (Moore *et al.*, eds, Cambridge University Press, 2001) drew world-wide attention to the topic.

Recent developments

To date, mycologists have concentrated on gathering scientific evidence of population declines. But fungal conservation is more than just scientific evidence. It also has a political dimension: the movement must use such scientific evidence ("fungal populations are declining") in political activities ("something needs to be done about it") to promote policy changes which will result in better protection for fungi. The political dimension makes it important to keep the science separate

Zeus olympius: provisionally assessed globally as critically endangered. IUCN Species of the Day, 21 February 2010 (<iucnredlist.org/sotdfiles/zeus-olympius.pdf>). Photo: David Minter.

from the politics. The science needs to be protected from the unscrupulous verbal abuse which is so often an unfortunate side-effect of lobbying. To achieve this, the movement for fungal conservation must have some basic infrastructure, including components independent from learned societies. There must also be an awareness of how to work in the political arena. In this respect, important and exciting developments have occurred in fungal conservation over the past few years.

- November 2005. A pioneering workshop was organized by the *European Council for Conservation of Fungi* in Córdoba, Spain. This was one of the earliest uses (perhaps the first) for fungi of the IUCN conservation status evaluation system.
- September 2007. Three prototype specialist committees were established for conservation of fungi inadequately covered by the IUCN's specialist groups of that time:
  1. *Mildews, Moulds & Myxomycetes* (<cybertruffle.org.uk/moulds>).
  2. *Non-lichen-forming Ascomycetes* (<cybertruffle.org.uk/ascos>).
  3. *Rusts & Smuts* (<cybertruffle.org.uk/rustsmut>).
- November 2007. The *Sociedade Brasileira de Micologia* established a national fungal conservation group, perhaps the first in South America.
- December 2007. At an international meeting in Spain on conservation and sustainable use of fungi, the *Declaration of Córdoba* (<cybertruffle.org.uk/whitby-mycosynod/decofcor.pdf>) was published by over 150 mycologists from 35 countries - a first attempt to establish global principles for fungal conservation.
- August 2008. The *Mycological Society of America* established a continental-level fungal conservation group for North America.
- November 2008. The *Asociación Latino-Americana de Micología* established a working party to set up a continental-level fungal conservation group for South America.
- January 2009. The *African Mycological Association* established a continental-level fungal conservation group for Africa.
- February 2009. The *Species Survival Commission* of the IUCN formally recognized fungi as needing fully separate representation within the Commission's structure. The Commission also decided to increase the number of Specialist Groups representing fungi to five by adopting the prototype specialist committees described above, and re-defining the old "Fungal Specialist Group" so that it henceforth covered the larger basidiomycetes.
- October 2009. At an international meeting in the UK (<cybertruffle.org.uk/whitbymycosynod>), the Chairs of the five IUCN *Species Survival Commission* fungal Specialist Groups, together with representatives from each continental level fungal conservation group, and mycologists from over 20 countries appointed a Steering Committee to prepare proposals for a federation of fungal conservation groups.
- November 2009. The *Mycological Committee for Asia*, at its *Asian Mycological Congress* established a continental-level fungal conservation group for Asia.

Collectively, these events constituted huge progress for fungal conservation. In geographical terms within every continental-level mycological learned society, there is now a conservation group in existence or at least in preparation, and therefore an identifiable cadre of people interested in fungal conservation. Conservation groups have also started to appear in national mycological learned societies, and even in one or two places at a local level. In terms of taxonomic coverage the reform and enlargement of the IUCN *Species Survival Commission* fungal specialist groups mean that there are now identifiable teams responsible for promoting conservation of all fungal groups. By the start of 2010, the one missing component was a general society specifically dedicated to fungal conservation, which could engage support from the general public, draw all of these elements together, and take responsibility for the political lobbying which conservation always entails.

The new society is established

IMC9 in August 2010, gathered mycologists from all over the world. This provided an excellent opportunity for meetings beyond the formal and purely scientific congress programme. The

steering committee mentioned earlier, appointed in October 2009, produced proposals for a new society for fungal conservation, and a special meeting was convened to discuss those proposals. The *Royal Botanic Garden* Edinburgh generously hosted the event. Nearly 60 mycologists from 21 different countries attended, with messages of interest and support from about ninety more, taking the total number of countries represented to over forty. In addition, there were messages of support from a range of learned societies, NGOs and national representatives of the CBD *Subsidiary Body on Scientific, Technical and Technological Advice* (the scientists who advise the *Rio Convention*). After animated discussion, there was overwhelming support to set up the *International Society for Fungal Conservation*.

Time constraints made it impossible to agree all of the draft constitution which had been circulated, but enough was agreed to determine the name of the Society, its status, address, objectives and activities, and to establish English as the Society's working language. A new steering committee was appointed to carry out the remaining work needed to bring the Society to an operational state. The composition of that Steering Committee is as follows: Peter Buchanan (New Zealand), Sharon Cantrell (Puerto Rico), Marieka Gryzenhout (South Africa), Greg Mueller (USA), David Minter (UK, co-ordinator), and Tatyana Svetasheva (Russia). The Steering Committee is now occupied in revising the draft constitution so that it can be circulated to Founder Members for comment and, hopefully, eventual adoption. As soon as possible, the minimum officers necessary for the Society to function will be appointed, and activities will begin. Even at this early stage - particularly at this early stage - new members are very welcome.

Likely activities of the new society

Until the constitution is adopted, and a system of governing the Society has been set up, there can be no formal policy within the Society. The following comments are therefore merely speculative and tentative ideas on general directions. They are far from exhaustive, but it is already clear that the Society will need to work in at least four general areas: infrastructure, education, science and politics.

Infrastructure. The Society will need to start fund-raising. Little can be achieved without money. The Society must promote and support efforts to establish a network of conservation societies for fungi working at different levels (continental, national and local). At present, fungal conservation is supported mainly by field mycologists and taxonomists. The Society needs to raise awareness among other mycologists, for example experimental mycologists, that their work is relevant to the movement, and that they too have a responsibility to promote conservation. The Society should also seek to raise awareness among curators of fungal culture collections of the important role these bodies have for *ex situ* fungal conservation. The Society will also seek to establish links with other organizations promoting conservation of overlooked and under-valued groups of organisms, so that experience and resources can be pooled.

Education. The Society will work with learned mycological societies to raise general public awareness of the importance of fungi, to promote the teaching of mycology at all levels in education, and to develop educational websites and other resources appropriate for that objective.

Science. The Society will work to identify, classify and publicise threats to fungi, and to identify important areas for fungi (fungal hotspots and coldspots), important fungal associated organisms, and impacts on human society which may occur as a result of fungal population declines and extinctions. The Society will furthermore promote the message that, without taking fungi into account, the ecosystem approach to conservation is so severely compromised as to be invalid. This will entail raising awareness that fungi are essential components of ecosystems.

Politics. The Society will develop policy, and will develop political expertise where possible by learning from the experiences of other conservation societies. The Society will seek to raise awareness of fungi among the CBD National Focus Points, and will also seek to engage governments which are not signatories to the CBD, making them aware of the importance of fungal conservation. The Society will seek to raise the profile of fungi, in part through a campaign to encourage biological institutions and learned societies to ensure that the language used in their promotional material properly reflects the true importance of fungi. This will, for example, entail discouraging language which results in confusion of fungi with plants ("botany" does not include "mycology", fungi are not "lower plants", they are not part of a "flora" etc.). Use of "biodiversity" as shorthand for "animals and plants" will also be discouraged.

The Society will also work to promote representation by mycologists on bodies concerned with biodiversity and conservation. If fungi are the "orphans of Rio", then mycology, like an orphan, enjoys little of the family wealth (mycologists are usually hidden away in obscure departments of botanical institutions, getting a very small share of resources), and mycology is rarely consulted on family matters by the biological sciences. Biodiversity initiatives should as a matter of course involve mycologists as equal playes from their inception. At present, in general, they don't.

Conclusions

As already stated, it is almost unbelievable that up to now there has been no society explicitly devoted to protecting fungi. Fungal conservation is far too important to be left to chance. The challenges are daunting. Establishing this new Society was an important and historic event in the conservation world. The Society needs enthusiastic support from all those who understand the pressing need to protect the "orphans of Rio".

David W. Minter *President, European Mycological Association*
(Whitby, UK; d.minter@cabi.org)

Mycological Society of America

The Mycological Society of America had its 2010 annual meeting among the gently rolling hills of the inner Bluegrass Region of the eastern United States - Lexington, KY, the "horse capital of the world." This was a joint meeting with the International Symposium on Fungal Endophytes of Grasses (ISFEG), a society that we had not met with in recent years. Both societies have many common interests and it was an excellent opportunity for the two groups to interact. The theme of the meeting was "Symbiosis."

The MSA pre-meeting foray took mycologists to the Bernheim Arboretum and Research Forest in Western Kentucky. This is a private educational facility dedicated to the restoration and preservation of Kentucky's native ecosystems, including forests, wetlands and grasslands. A wide array of fungi was found despite the dry weather. It was wonderful to visit with friends and colleagues among the trees.

The invitational Karling Lecturer was Sally Smith, an excellent speaker and powerful researcher in the field of mycorrhizal symbioses. She gave a charming overview of her work on phosphorous transfer in arbuscular mycorrhizae. The keynote speaker of ISFEG was Charles W. Bacon who gave a review of the basic biology of forage grass fungal endophytes. Symposia included "Impacts of endophytes on host plant ecology and biotechnology," "The role of stress response mechanisms in symbiotic and pathogenic associations of fungi," "Advances in DNA barcoding for fungi," and "Molecular insights into the fungus:host plant interface." An informal meeting was held for mycologists interested in the status of white-nose syndrome, a devastating fungal disease of bats in eastern North America.

Several prominent mycologists received awards at the meeting. These included: Gary Samuels (USDA-ARS Systematic Mycology and Microbiology Laboratory, Beltsville, MD) – Distinguished Mycologist; Joseph Spatafora (Oregon State University) – Weston Teaching Award; Anne Pringle (Harvard University) – Alexopoulus Prize for Outstanding Early-Career Mycologist; Steven Stephenson (University of Arkansas) – MSA Fellow; and José Carmine Dianese (Universidade de Brasilia) – Honorary Member. Twenty-five students and young professionals received awards for travel and research excellence. Eight students received International Travel Awards to help defray expenses for their participation in IMC9. The annual banquet was held at the famous Kentucky Horse Park (<kyhorsepark.com>) and included local cuisine and entertainment. The annual auction featured a wide array of literature and mycological curiosities so that everyone left with something new!

Preparations are already underway for next year's annual meeting at the University of Alaska – Fairbanks. The theme of that meeting will be "High latitude fungi in a changing climate." More information on this meeting can be found throughout 2011 at <mercury2.iab.uaf.edu/msa/>. MSA has not previously met in Alaska, so this should be an excellent opportunity to explore boreal fungi in the "Land of the Midnight Sun."

Jessie A. Glaeser
(msasec1@yahoo.com)

Silent auction at MSA 2010 annual meeting. Photo: Thomas J. Volk.

MSA pre-meeting foray at the Bernheim Arboretum and Research Forest, near Bardstown, KY. Photo: Thomas J. Volk.

Iranian Mycological Society

It gives me great pleasure to announce that the Iranian Mycological Society is now established. The calls for the establishment of such society first came some 15 years ago, but the major move was made two years ago at the 18th Iranian Plant Protection Congress in Hamedan (Iran)in 2008 where about 70 mycologists from universities and research institutions in the country gathered and registered to become members of this society; the society was subsequently officially registered at the high commissions for scientific societies of the Iranian Ministry of Science, Research and Technology. With respect to the number of mycologists, the need for this society was approved by this commission. Consequently, the first general meeting was announced and took place on 15 September 2010. Members of the executive committee were elected by those present in the general meeting and five members were elected to officially follow up on various tasks for the Iranian Mycological Society. A website is dedicated to this society (<imys.ir>) with a permanent office at the Iranian Research Institute of Plant Protection, Tehran. The following mycologists were elected for the 3-year period 2010-2013 -- the first officers of the executive committee of the Iranian Mycological Society:

President: Djafar Ershad (Emeritus Professor, Iranian Res. Inst. of Plant Protection)

Vice-President: Mohammad Javan-Nikkhah (Associate Professor, University of Tehran)

Secretary: Rasoul Zare (Professor, Iranian Research Institute of Plant Protection)

Treasurer: Mehrdad Abbasi (Associate Professor, Iranian Research Institute of Plant Protection)

Newsletter editor: Akbar Khodaparast (Associate Professsor, University of Guilan)

Rasoul Zare
(simplicillium@yahoo.com)

Mycologists at the end of the first general meeting of the Iranian Mycological Society. *Left to right*: D. Ershad, S. Rezaee, A. Khodaparast, H. Azimi, M.J. Soleimani, A. Abbasi-Moghaddam, Gh. Hedjaroude, M. Abbasi, M. Javan-Nikkhah, V. Minassian, Z. Banihashemi, Gh. Balali, B. Sharifnabi, and R. Zare.