

Towards assessment of fungi, including lichens, for the IUCN Red List – species nominations needed!!

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The IUCN produce Red Lists, the purpose being to assess the risk of extinction of living organisms (Figure 1). Any species can be assessed and categorised, no matter how common. For instance, *Homo sapiens* are Least Concern (LC) with an increasing population trend! At the time of writing (August 2014) there are only *three* fungi (two of which are lichens) on the IUCN Red List.

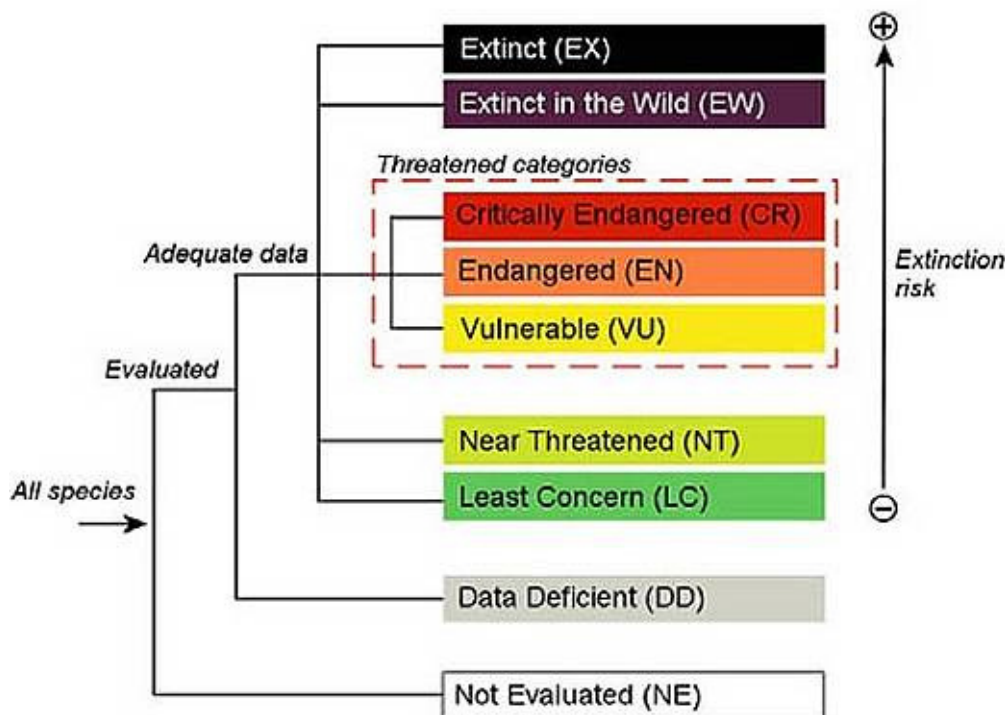


Figure 1: Structure of the Red List Categories (Source IUCN, http://www.iucn.org/about/union/secretariat/offices/iucnmed/iucn_med_programme/species/red_list)

The main reasons for this are perhaps because: (1) few mycologists have been engaged or interested in international conservation issues; (2) fungi have been considered so special that they must need their own ‘red-list-system’ to be conservation evaluated. Only recently has it been understood and appreciated that, to be successful, fungal conservation must go hand-in-hand with conservation efforts for all other aspects of biodiversity. It is acknowledged that there are difficulties in assessing the conservation status of fungi. For instance, very little is known about the distribution and population size of most fungi, and due to continuous nomenclatural and taxonomic upheavals it is difficult to even determine ‘what is a species?’ Also issues such as what constitutes an individual; is a fungus still present if it is not fruiting; and is a species, which is recorded on different continents, really one species? However, there are similar issues with other groups of organisms which undergo IUCN Red List evaluation, so these problems should not deter us!

Like all other organisms, fungi suffer the consequences of the deterioration of the environment in which they exist, and similarly need conserving. Fungal conservation was recognised as important as far back as 1985 with the formation of the European Council for the Conservation of Fungi. A symposium on fungal conservation was held by the British Mycological Society in 1999 and an edited book produced (Moore et al. 2001). At the same time, an international conference on lichen conservation biology was jointly organized in Switzerland by the Swiss

Federal Institute for Forest, Snow and Landscape Research WSL, and the IUCN. There was already an awareness amongst lichenologists of the need for conservation of lichen forming fungi (Scheidegger et al. 1995, Scheidegger et al. 2000, Scheidegger and Goward 2002, Scheidegger and Werth 2009). From 2006 the IMI Descriptions of Fungi and Bacteria included information regarding the conservation status of the species presented. What is now recognised as the first international congress on fungal conservation was held in Córdoba, Spain in 2007. Also around this time the IUCN further acknowledged the importance of fungal conservation by increasing the number of fungal specialist groups in its Species Survival Commission to five, which is how it currently stands (Vilaró et al. 2012).

Despite the advances outlined above, it was evident that at the time, there remained a perception that fungi were either not important, or could be included under the umbrella term 'plants' judging by an evaluation of the Convention on Biological Diversity (CBD) Action Plans and Reports submitted by signatory countries (<http://www.fungal-conservation.org/micheli.htm>). In these reports few countries either included fungi or wrote about them in a conservation context (Abdel-Azeem and Minter 2011). Furthermore, most country profiles on Wikipedia failed to acknowledge fungi while discussing their biodiversity (Minter 2011b).

In 2009 the formation of the International Society for Fungal Conservation was proposed at a meeting in Whitby, and as well as a committee subsequently being elected to run the society, a journal 'Fungal Conservation' was established. This journal, which is Open Access and available on the ISFC website (<http://www.fungal-conservation.org/publs.htm>) provides an update on attempts being made to address the issue of poor representation of fungi in the IUCN Red List.

There have so far been two initiatives using different approaches. Firstly, Minter (Minter 2011a) reported on how ascomycete species were evaluated for their conservation status (<http://www.cybertruffle.org.uk/darwin-microfungi/samredli.htm>). This involved using the Sampled Red List Index scheme and was applied to ascomycetes (after some necessary data quality control) to give an approximation of the conservation status of members of this group, which could then be extrapolated from the random sample tested, to the group as a whole. The method was entirely computerised and generated the rather disappointing, but not unexpected, results that 95% of the species were data deficient. However, as Minter (2011a) is at pains to point out, these fungi have now undergone preliminary assessment and are now eligible to be moved from the 'Not Evaluated' to the 'Data Deficient' IUCN categories. This is a considerable result, but Minter (2011a) notes that poor perception by funding bodies from this large proportion of data deficient fungi may act as a deterrent for funding further evaluations. Indications from the data of endemism and substrate specificity could be followed up however, and this study has provided a starting point for this process.

A second approach is the direct nomination of fungi, including lichens, by experts in a given taxon who are aware of the potentially rare status of their proposed species. This is called the "Global Fungal Red List Initiative" (Mueller et al. 2014). Nominated species will need to be submitted along with certain data to support preliminary assessment. In order to facilitate this process an interactive website has been developed with instructions on its use (<http://iucn.ekoo.se/>). Mueller et al. (2014) outline 5 steps which will be undertaken in order to propose, and hopefully contribute, more fungal species to the IUCN Red list. The initial step is however for mycologists and lichenologists to nominate species via the website (<http://iucn.ekoo.se/>).

There is no doubt that a complete assessment of a single species takes some considerable time (Dahlberg and Mueller 2011), even if the data supplied is very detailed and comprehensive, which in many cases it may not be. However, the aim is to undertake preliminary assessment of as many as 300 species and then prioritise the most likely candidates (Mueller et al. 2014), with an aim to contributing towards the 2014 and 2015 IUCN Red Lists.

Mycologist and lichenologists can contribute as follows:

- 1). Propose species.
- 2). Comment on already proposed species.

Members of the Fungal Red List Initiative encourage nominations ***before the end of 2014*** in order that the preliminary assessments can be carried out. So without delay, visit the website (<http://iucn.ekoo.se/>), register and start proposing your species. Remember to please add as much detail as possible and in particular comment and provide additional information on distribution, ecology, threat and so forth, on species suggested by others.

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