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## Uganda's Mycota

### By Perpetua Ipulet

Uganda is a small country between the Democratic Republic of Congo (DR Congo) and Kenya, lies within the East African region and covers an area of about 236,000 km<sup>2</sup>. The central part of the country is characterised by a gentle topography of flat-topped hills and broad, often swampy valleys lying at an altitude of 1000 – 1500 m. More spectacular scenery is found in the west where the landscape is dominated by the rift valley and its associated lakes and mountains. In the east the international border follows a line of raised land associated with the large Miocene volcanoes of Mountains Elgon, Kadam and Moroto. Lake Victoria, the second largest lake in the world covers the down-warped south-central part of the country.

Uganda has a diverse climate influenced by latitude, altitude and topography. Seasonal movements of the Inter-tropical Convergence Zone (ITCZ) determine the general pattern of rainfall, with rainy seasons during April – May and October – November. Much of the country receives 1000 – 1500 mm of rain per annum. Mean temperatures are influenced mainly by altitude, the warmest areas lying in the Rift Valley and the plains of the north, the coolest being the highlands of south-west and eastern border areas. Climatic conditions favourable to the formation of forest are found in parts of the southern half of the country where rainfall exceeds 1150 mm p.a. evenly distributed throughout the year, and on the Karamoja mountains where low temperatures associated with altitude serve to moderate water loss during the long dry season.

Ecologically Uganda is exceptionally diverse largely due to its location in east-central Africa, in a zone of overlap between ecological communities

characteristic of the dry East African savanna, and those of the West African rainforests. It is also partly the result of the country's great topographical diversity, with a range of altitude from below 600 m in the bottom of the rift valley, to 5109 m (16 763 feet) at the top of the Rwenzori mountains, Africa's third highest mountain range. The UNESCO Vegetation map of Africa (White, 1983) shows that seven of mainland Africa's 18 phytochoria ('plant endemic species' richness regions) are represented in Uganda, more than in any other single country. Uganda therefore contains vegetation and associated animal communities, characteristic of habitats as diverse as glacier-topped mountains, lowland and montane rainforests, wooded savanna, grassland, bushland and thicket.

There is evidence of forest clearance and cultivation dating as far back as 2000 years. Currently less than 12% is covered by forest and woodland, 96% of energy consumption is provided by wood fuels. In addition, Uganda is predominantly an agricultural nation and with its population standing at about 29 million, there is a lot of pressure on land.

Development of myco-collections alongside plant herbaria in tropical Africa has for several decades been neglected. In the past 10 or so years in Uganda, fungi and especially macrofungi have received a little more attention. Edible and medicinal mushrooms stealing the show; with mycorrhizal fungi, polypores and litter decomposing fungi as isolated studies.

The Makerere Herbarium (MHU) at the Botany Department, Makerere University (Mak), plays the



Pictures from Jolanda Roux's African trips.



role of a national herbarium. Established in 1946, it houses a little over 50 000 collections of plants including lichens and bryophytes. Except for crop pathogens, documented species of fungi are housed in myco-collections outside Africa, and the MHU duplicates cannot be traced. It has also been noted that most local researchers of macrofungi do not obtain material useful for reference purposes.

A myco-collection of 2008 specimens is being established, consisting of roughly 173 species of polypores. Other groups represented, though in small numbers, are mostly hymenomycetes - *Aphyllphorales* and *Agaricales*. The polypores are 54% of species recorded Africa south of the Sahara which has about 317 documented species according to Ryvarden (2000). Given the country's high diversity for reasons above, and that most areas have not been visited, possibly many species are yet to be documented. Material is also being collected for DNA analysis of the difficult taxa, and plans are underway to establish a culture collection. A short local course on 'Modern fungi systematics' is planned for January – February 2008 at Makerere University and Rwenzori mountains DR Congo.

#### Acknowledgements

We thank the following persons for their contribution to the development of this collection: Prof Leif Ryvarden's (University of Oslo, Norway), Prof HK Taligoola (Department of Botany, Mak), Prof Kare Lye (Norwegian University of Life

Sciences), Dr Cornelius Decock (Catholic University Louvain, Belgium). Many persons especially fellow mycologists are saluted for their contributions.

Sincere thanks are extended to the following organisations for their support: MacArthur Foundation, Makerere University Institute of Environment and Natural Resources, Chicago Field Museum, Norwegian Development Agency – NORAD, and The Global Taxonomy Initiative – Belgian Focal Point.



Collecting fungi in Liege, Belgium: Perpetua Ipulet (standing), Gabriel Castillo (bending), Cony Decock.

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### Report of the All Fungi Barcode of Life

By Amy Rossman

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**Summary.** Thirty-seven invited participants from twelve countries met from 13-15 May 2007 at the Smithsonian Conservation and Research Center Front Royal, Virginia to discuss DNA barcoding of all true Fungi as well as the Oomycota. The goals of the meeting were to arrive at a consensus on a standard gene region for barcoding fungi, brainstorm and prioritize projects, and establish a steering committee. The first day was devoted to reporting experiences with use of the CO1 gene as a barcode followed by those who had used other genes. Although the CO1 gene works for the non-fungal group Oomycota and a few groups of true Fungi, it does not work well for most true Fungi. The consensus of the participants was that the most appropriate gene known at present for DNA barcoding of true Fungi is the ITS region of the

nuclear rDNA. The next day researchers reported on fungal DNA barcoding projects already in progress and brainstormed about possible big science projects that involved DNA barcoding. General topics such as vouchering specimens from DNA barcoding, obtaining DNA from herbarium and culture collections, and standards for DNA barcodes were woven into these discussions.

#### The Meeting

With 90-99% of the fungi still unknown, it is expected that a great deal of diversity will be revealed through DNA barcoding as demonstrated by studies using environmental sampling in which major new lineages have been revealed. Those most excited about the application of this technology are ecologists working with