

MYCORRHIZA NEWSLETTER 6 – February 2007

Editorial note

Dear fellow Mycorrhiza

There are now more than a hundred people on our e-mail list server. Because many of you newcomers may not understand what the newsletter wants to achieve, I thought of explaining it again. Please remember that the newsletter is meant to be understood by everyone, it is not written only for scientists. Also, any questions about something in the newsletter or something else are always welcome.

The **BOF** feature stands for **Beginners of Fungi**, and are there for those of us who know nothing about fungi. It deals with a small topic in each newsletter, but each BOF follows on the previous features. For you to understand everything you thus need to read the previous ones too.

The **Feature** deals with a slightly more advanced topic. We started off explaining the different groups of larger fungi that you will see, but in future these features will also deal with interesting stories of fungi, or how to identify a particular group of fungi, for instance all the different puff balls. Here any input is welcome, if you would like to contribute something.

The **Recipe of the month** is exactly that, and here especially I want to hear from you. In every newsletter we treat at least two **Fungi of the month**, thus what they look like and background information. One of the fungi will be something common, and the other less common or very interesting. Lastly, any unknown fungi I encounter, or that those of you keen on taking photos send to me, might end up in the **UFO (Unidentified Fungal Organisms)** section. Here we want to pick each others brains, maybe someone will know what it is. We will not always get names for them, but some of them are just too beautiful not to share.

After each newsletter I send out a follow-up. This includes any feed-back from the newsletter, e.g. names for the UFO's. I also include additional UFOs in the follow-up, because there are so many.

New people are continuously added to the list, and I simply cannot keep up with sending the newsletters out to them. We will have a little website up and running before the end of March (I hope!) that will include previous newsletters for you to download.

From now on, I will start to send out the newsletter every second month since I think I have laid down the basis for the new features that will follow. The follow-up of the newsletter will then come out in the month in between. If any of you also want to write a feature about a pet fungus project, you are most welcome to contact me.

Last but not least, I want to thank Dr. Joanne Dames from Rhodes University, Grahamstown, very much for the contribution she sent me about the Kalahari truffle (in response to my questions). She is heading a group working on mycorrhiza (real ones, not virtual ones such as our newsletter). Some info about their work can be found at <http://www.mycoroot.com>.

Enjoy!
Marieka

BOF (Beginners of Fungi)

Ascomycetes

In Newsletter 3 I briefly mentioned that **macrofungi** (the fungi we can see with the naked eye) are divided into two groups: the **basidiomycetes** and the **ascomycetes**. The past three newsletters dealt with the different groups within the basidiomycetes. This newsletter will deal with ascomycetes, but first I have to explain what ascomycetes are.

Basidiomycetes form their spores on microscopically small, club-like structures called **basidia**, and these basidia line the **hymenium**, that is the fertile surface that is found on the gills, pores or a smooth surface somewhere on the fruiting body. Ascomycetes, however, form their spores in a totally different way, which is again microscopically small, yet hugely important. The spores are formed within structures that literally look like sacs, called **asci** (singular: **ascus**), and they are thus called **ascospores**. The spores are then expelled through the top of the sac. These sacs look different and have different mechanisms with which to expel the spores.



Perithecium

Asci and brown ascospores

Usually the asci are formed within larger structures that vary incredibly in form and function (see above photograph on the left), and often these structures are again borne within other structures. I will not go into the different structures and shapes of these, but you will get a vague idea when we deal with the different groups of “macro-ascomycetes” in the next feature.

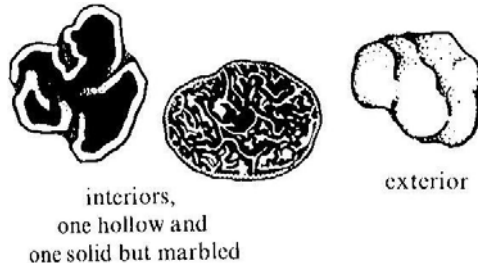
In the field, fruiting bodies belonging to the larger ascomycetes are in general smaller than those of the mushrooms, and are often brightly-coloured. Some of them you will know are ascomycetes, while others have look-alikes in the basidiomycetes. However, most of the ascomycetes are small (0.5-3 mm) and only the trained eye can find them. Yet these very small fungi are equally wonderful than their larger relatives and I will hopefully one day share them with you.

Feature

The different groups of macrofungi – part 5

Representatives of these are in the Fungi of the month and UFO's sections. Again, the pictures and info comes from Arora's book.

15. Truffles

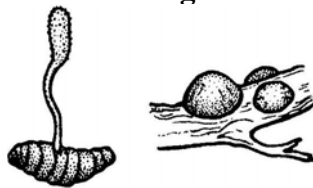


Truffles occur underground, in the layer between humus (plant litter) and soil, or in the lower levels of humus. They are tuber-like, round to oval, with the interior hollow or with cavities or canals, or solid with veins. The texture inside can be firm or powdery but never gelatinous. They rarely have a stalk (columella).

In the previous newsletter I treated false truffles, which look similar. Truffles differ from false truffles because the interior of false truffles can be gelatinous, are not often powdery and never hollow, while that of true truffles is powdery but never gelatinous and can be hollow. False truffles have columellas. Lastly the biggest difference of them all, truffles have their spores in asci while those of false truffles are borne on basidia.

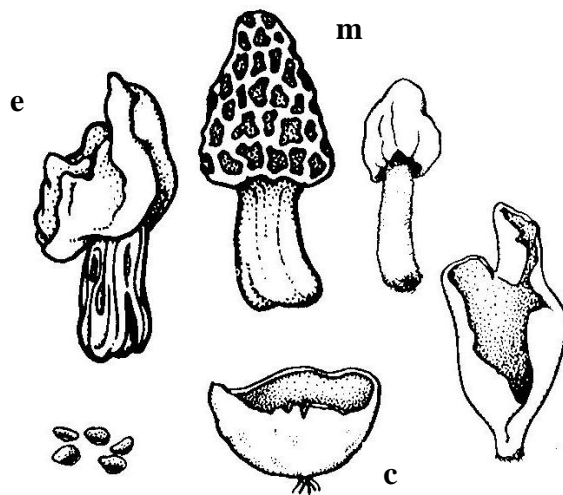
Because truffles (and false truffles) occur underneath the ground, they are not often seen and they rely on being dugged out and eaten by animals that disperse spores through their digestive systems. For this to happen, truffles often have a strong smell to attract the animals.

16. Flask fungi



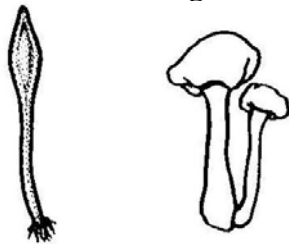
A large and diverse group, ranging from microscopically small to large enough to see with the naked eye. The major difference is microscopic, that is the spores and asci are produced in flask-like structures called **perithecia** (like the structure on the left under the BOF feature). These perithecia can be on their own and of all kinds of colours, or they can be embedded in larger structures with the mouth of the perithecia sticking out of the surface as little dots or bumps. They can occur on a wide diversity of habitats, ranging from plant material to insects to other macrofungi.

17. Morels, elfin saddles and cup fungi



Ascospores are produced in a fruiting body that is flat to cup-shaped (**cup fungi - c**), with or without a stalk, can sometimes look like a mushroom because they can have a stalk and cap, the cap can be cup-shaped, saddle-shaped (**elfin saddle - e**) or irregularly lobed or brain-like (**morels - m**). They come in all kinds of colours and are often quite striking.

18. Earth tongues



Erect, unbranched, elongated fruiting bodies, usually with a flattened or swollen fertile “head” or small cap, usually small. Can be confused with coral and club fungi (previously treated), and again the difference will be the microscopic way the spores are produced. But you will develop a good idea which is which with experience.

Fungus recipe of the month

This recipe is a traditional Tanzanian mushroom dish (yes, mushrooms are being used by many cultures in Africa) from a Tanzanian mushroom book (Härkönen et al., 2003). This is being cooked by three cultural groups in Tanzania. The combination is a bit unusual, that is why I included it.

Mushroom with banana

Bananas

Mild-tasting mushrooms like *Termitomyces* (those of you in Natal lucky enough to buy it from the people standing next to the road), *Macrolepiota* or *Agaricus* (hence the mushrooms at the grocer)

Water

Salt

“Boil bananas in a small amount of water for 10-20 minutes. Put cleaned and chopped mushrooms on top of boiling banana and add some salt. The mushrooms become heated in the steam over the boiling bananas. Cook still for 5-10 minutes and the dish is then ready to eat.”

Fungi of the month

Terfezia pfeilii (Kalahari truffle, n’Abba)



Many highly prized edible fungi form an intimate association with the roots of several of our exotic tree species (e.g. Pines) that are grown in managed forests. These fungi were introduced with these exotic trees and many are harvested and marketed internationally. However the most highly prized forest truffles, such as the Périgord Black Truffle, found in the northern hemisphere are not found in South Africa. Our own indigenous desert truffle, the Kalahari truffle, is not as well known. This truffle referred to scientifically as *Terfezia pfeilii* derived its name from *terfez*, which is Arabic for truffle and *pfeilii* after Friedrich Wilhelm Leopold Pfeil 1783 –1859, a botanist that worked in eastern Africa. Recent analysis of the DNA or the genetic blueprint of several closely related desert truffles have indicated that *T. pfeilii* is distinct from others in the same group and a new name, *Kalaharituber pfeilii*, was suggested (Ferdman *et al.*, 2005). However this study did not include any truffles collected in South Africa. Research conducted, in the Mycorrhizal Research Laboratory of Dr Joanna Dames at Rhodes University have confirmed that the South African Kalahari truffle is identical to those examined previously, so a name change may be inevitable. However Dr Dames has indicated that samples from different areas would still need to be examined as other closely related species such as *T.*

austroafricana and *Choiromyces echinulatus* have been reported to occur in the South Africa (Marasas & Trappe 1973). Although several host plants have been suggested to form a mycorrhizal relationship with the Kalahari truffle, the exact hosts fungus relationship have not been conclusively confirmed and is further investigated by Dr Dames. The truffles occur in the Northern Cape region around Kakamas, Prieska, Kimberly, Upington and into Botswana, Namibia and Angola. They appear between April and June after good rains. Truffles are formed underground and cracks in the sandy soil are the only sign of their presence. Gently removing the soil reveals the desert prize, with an average size of a medium potato. When cut the truffles have a light marbled white appearance and turn yellow on exposure to air. The Kalahari truffle has a delicate flavour and can be prepared and used in a variety of dishes.

Ferdman, Y., Aviram, S., Roth-Bejerano, N., Trappe, J.M. and Kagan-Zur, V. 2005. Phylogenetic studies of *Terfezia pfeilii* and *Choiromyces echinulatus* (Pezizales) support new genera for southern African truffles: *Kalaharituber* and *Eremiomyces* Microbiological Research. **109**: 237-245.

Marasas, W.F. and Trappe, J.M. 1973. Notes on Southern African Tuberales. *Bothalia* **11**: 139-141.

By Joanna Dames (j.dames@ru.ac.za)

If you want to taste a Kalahari truffle and if you are in the Stellenbosch area, you must visit, or even stay over, in the Wild Mushroom Guest House where you can enjoy Kalahari truffles first hand. This is part of the South African Gourmet Mushroom Academy, a venture of Dr Adriaan Smit. They also serve all kinds of other mushrooms, and you can thus experience why many mushrooms are such choice edibles and how their flavours differ. For more info, look at <http://www.wildmushroom.co.za/>.



Adriaan Smit

Distinguishing features: almost round to top- or pear-shaped, pale yellow-brown to dark brown, smooth surface, when cut open the inside flesh is whitish to cream with a faint marbled appearance, which turn yellow with age with more prominent veins (Van der Westhuizen & Eicker).

***Scutellinia scutellata* (eyelash pixie cup, Afr: wimper feëttjekoppie)**



Etymology: scutel – dish.

It occurs on rotten wood or damp soil. We actually found this one on wood in a small stream. Similar species and genera can be distinguished based on cap size, colour, and morphology of hairs and spores.

Distinguishing features: 2 mm to 2 cm in diameter, bright red small cup with dark hairs lining edge (the hairs are not so clear here because the structures in the photograph were found in a small stream and are thus wet).

UFOs (Unidentified Fungal Organisms)

Follow-up from Newsletter 5 follow-up

Tom May from Australia made my day when he provided us with a name for The Blob (UFO 16). I copied his e-mail below. This was confirmed by Tommy Knutsson. Thanks also to Danie Botha and Hugh Glen who gave me the name of the host: *Anthocleista grandiflora* (Forest Big-leaf / Forest fever-tree / Grootblaarboom).

The UFO 16 'The Blob' looks like *Abortiporus biennis* (= *Heteroporus biennis*). This produces large fruit-bodies with a short stipe and several lobed pilei, but can also be quite deformed in unusual shapes,

as in the Tzaneen specimens. Fruit bodies can occur at the base of trees, or arise from dead stumps or buried dead roots. *Abortiporus biennis* can grow around twigs and living blades of grass, incorporating these into the fruit-body. Pores may not develop evenly on the underside, or may even form on the upperside. The pore surface bruises reddish. Microscopically it is distinctive because it produces globose chlamydospores.

See for example: <http://www.mushroomexpert.com/abortiporus_biennis.html>

UFO 18 – *Xylaria*, an example of a flask fungus.



Marieka

There are many different *Xylaria* species. What they all have in common is that they have finger-like or antler-like fruiting bodies differing in size and colour. Some species look like black fingers and have the common name dead man's fingers. This particular species I found in the Walter Sisulu Botanical Garden in Roodepoort, Johannesburg. It had the most beautiful colours, making it conspicuous despite its small size.

The reason why this is a flask fungus is because the perithecia, the little flasks that form the ascospores, are embedded in the finger-like structures. When you look closely at a mature specimen, you will see the little dots on the surface or it will have a lumpy appearance.

Etymology: xyl-, wood, wooden, woody.

UFO 19 – an elfin saddle (*Helvella*)



This fungus was found in Pietermaritzburg in a pine plantation. Species of *Helvella* have a variety of shapes. This one has a distinctly ribbed stalk and cream cap, and could thus be *Helvella crispa*. The cap could be up to 5 cm wide and the stalk could be up to 10 cm long. It occurs on the ground or on rotten wood.

Etymology: *helvella* - ancient term for an aromatic herb, *crispa* – curly, crisp.

UFO 20 – an earth tongue



This beauty Lou-Nita le Roux found in the Lowveld Botanical Garden (Nelspruit). As you can see it is quite small, but brightly coloured with a flattened surface. It could be a *Mirtula* species? One has to do microscopy on it to be sure. (So, who spotted the bird's nest in the background?)