

## FUNGI

We are about to delve into the world of Mycology !

Fungi are largely unseen organisms. This is because many are microscopic and the vegetative bodies of many others grow within plant and animal bodies or the soil or organic detritus. It is not surprising that most people have little appreciation of the importance of the Fungi.

However, this diverse group of organisms plays a vital role in maintaining the health of eco-systems and is useful to us in a number of other important ways.

- Fungi make an important contribution to the breaking down of dead plants and animals; without the combined efforts of some invertebrates, fungi and bacteria, we would quickly become overwhelmed with corpses and the re-cycling of relatively simple chemicals would not occur.
- Many foods are prepared using techniques that are dependent on certain types of fungi – bread, cheese, alcoholic beverages, etc. The fructifications ("fruiting bodies") of some fungi are considered by some to be culinary delicacies.
- Penicillin is probably the best known medicine derived from fungi but there are many others.
- Some stages in the industrial production of certain chemicals involve the deployment of fungi.
- Several important natural dyes are extracted from fungal material.

On the other hand, we wrestle with many problems caused by some fungi.

- The destruction of foodstuffs.
- Diseases of plants – potato blight, wheat rust, etc.
- Diseases of animals, including Humans, of which "Athlete's Foot" is an example.  
*There are two fungi which are of particular interest to beekeepers in this respect; both are pathogens of brood. *Pericystis apis* is the agent that causes "Chalk brood" and two species of *Aspergillus* are responsible for "Stone brood". *Pericystis alvei* is not a pathogen but it causes pollen to go mouldy in damp conditions.*
- Decay of wooden building materials, "wet- and dry-rot".

### What is a Fungus?

Most fungi have a vegetative body made up of a network of extremely fine threads that is called a "mycelium". These threads are sometimes packed together to form a dense mass of tissue. Both asexual and sexual reproduction are common, each species having its own particular arrangements. An example of the former is the "budding" of yeast whilst the latter is demonstrated by the common field mushroom in the production of spores which are dispersed to start new growth of the organism elsewhere.

### Classification.

Formerly, fungi were considered to be primitive plant forms but they are now placed in a Kingdom of their own. Unlike the vast majority of plants, they do not have pigments (like chlorophyll) that would enable them to photosynthesise and are dependent upon other organisms for a supply of the complex food-chemicals required to sustain life. Many fungi develop so-called "symbiotic" relationships with trees, shrubs or herbs in order to achieve this but each partner in such a relationship derives some benefits. There are many fungi that grow in, or on, the roots of plants forming "mycorrhizas"; the network of fungal threads takes up water and nutrients from a larger area than that covered by the roots of the photosynthesising partner and the two organisms can share the proceeds of their joint endeavours. The mycelial networks can be extremely large; in the U.S.A., one such network that has been shown (by molecular analysis) to be of one individual honey fungus, stretched for 3.5 miles! For a long time, Lichens were considered to be plants in their own right but it is now accepted that these

are essentially fungi with (often quite specific) algae cells incorporated into their bodies, again forming a mutually beneficial arrangement.

Currently, 5 (or, by some people, 4) sub-groups are recognised:

|  |                                   |  |
|--|-----------------------------------|--|
| Myxomycetes<br>powdery spores.   | Slime Moulds                      | Multinucleate, amoeboid forms. Dry                                   |
| Phycomycetes<br>cells.   | Some micorrhizas                  | Hyphae lack cross-walls. Non-motile sex                              |
| Ascomycetes<br>replaced by   | Pin moulds<br>Elf cups and Morels | Hyphae with cross-walls or hyphae                                    |
| ascus (a   | Brewers / Bakers yeast            | budding cells. Sexual spores formed in an                            |
| four.  |                                   | bag-shaped structure) in multiples of                                |
| Basidiomycetes<br>replaced by  | Mushrooms, Brackets,              | Hyphae with cross-walls; rarely hyphae                               |
| formed   | Puffballs, Wheat rust,            | budding cells. Sexual spores (usually four)                          |
| "basidium".  | etc.                              | externally on a specialised cell, a                                  |
| Deuteromycetes<br>Basidiomycete-type<br>("Fungi Imperfecti")<br>asexually. | <i>Penicillium sp.</i>            | Ascomycete- and (less common)<br>forms that appear to reproduce only |

It is now considered that a 1993 estimate of 1,500,000 different fungal species world-wide may well be too low!

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