

An introduction to fungi

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The speaker emphasised that she was not a fungus expert and admitted that she had found it difficult to know what to include in her talk.

What are fungi

Fungi are made up of mycelia, a mass of tiny white threads hidden beneath the surface and fruiting bodies, the familiar mushroom or toadstool, which produce spores for new fungi. One fungus produces millions of spores so there are always some around.

Plants make sugar by photosynthesis and animals generally eat food and digest it internally but fungi, which form a separate Kingdom, secrete digestive enzymes and absorb the soluble products.

Life styles

Fungi have 3 distinct life styles:

- parasites, which feed on living tissue and damage or even kill their host;
- saprophytes, which decompose and recycle dead or decaying organic material; and
- symbionts, which form a mutually beneficial mycorrhizal association with plant roots.

Honey fungus (*Armillaria*) is a pernicious parasite of trees which spreads by rhizomorphs, black shoe-string filaments. In the Malheur National Forest in Oregon, USA, is a monster honey fungus, which is estimated to be 2,400 years old. It is 3.5 miles across and covers 2,200 acres. Discovered in 1998, it is the world's biggest living organism.

Decomposers of leaf litter and dead wood include those with a cap and stem, such as sulphur tuft and bracket fungi such as turkey tail.

90% of plants depend on mycorrhizal fungi for minerals from the soil. Examples include fly agaric, a symbiont of birch. There are even fertilisers sold which are advertised as including spores of mycorrhizal fungi.

Lichens are a dual organism comprising a fungus in which there is an algal layer. They may be crustose or branching.

Types of fungi

Smaller fungi include yeasts, moulds, rusts and blight, while larger fungi include:

- mushroom-shaped fungi, some known as toadstools, though there is no scientific difference between them;
- puff-balls;
- bracket fungi, many of which persist from year to year;
- crust-like or resupinate fungi; jelly fungi; and
- many, many more.



Puff-balls



bracket fungi ,



resupinate fungi



jelly fungi

Identifying fungi

The speaker then concentrated on mushroom-shaped fungi.

Identification of fungi can be very difficult, since only a few have common names and many have more than one Latin name. However, the features to note are:

- habitat – grass, leaf litter, wood, near trees;
- occurrence as solitary fungi, clusters or rings;
- shape, size and colours of all parts;
- special features such as a collar (volva) or ring on the stem, the remnants of the universal veil, which protects the fungus as it comes up through the soil, and scales,;
- colour changes if flesh is bruised or broken;
- colour of any milk,
- smell; and
- spore colour, often best seen using spore prints.

Mushroom shaped fungi are of 3 basic types:

- gill fungi or Agarics;
- pore fungi or boletes; and
- tooth fungi.



Gill fungi



Pore fungi



Tooth fungi

The speaker illustrated a number of boletes, including Red cracking bolete (*Boletus crysenteron*), the Bay bolete (*B. badius*) and Brown birch bolete (*B. scabrum*).

The speaker then illustrated 12 different type of agarics:

1. *Amanita*, including Fly agaric, Death cap and False death cap, which have a bulbous base with a collar above;
2. Parasols (*Lepiota*), which have a moveable ring left behind as the cap opens up, including the Shaggy parasol, which grows by compost heaps;
3. Funnel Caps (*Clitocybe*), which have decurrent gills running down the stem and a central depression in the cap, including Clouded agaric (*C. nebularis*) and Trooping funnel (*C. geotropa*), which has a much thicker stem and smaller cap and is very common;
4. Tough Shanks (*Collybia*), such as the Butter cap (*C. buteraceae*);

5. Milk Caps (*Lactarius*), with over 50 species, which exude a milky fluid when the stem is damaged;
6. Brittle Gills (*Russula*), with over 100 species, including Common yellow russula (*R. ochroleuca*);
7. Wax Caps (*Hygrocybe*), including the Parrot, Snowy, Meadow and Conical wax caps, which often change colour as they mature and many of which have partly decurrent gills;
8. Deceivers (*Laccaria*), including the Deceiver (*L. laccata*) and the Amethyst deceiver (*L. amethystea*);
9. Bonnet Caps (*Mycena*), with over 100 species, including *M. pura*, which grows in beech leaf litter;
10. Ink Caps (*Coprinus*), in which the gills auto-digest to exude a black inky fluid, including Fairy bonnets (*C. disseminatus*) and Shaggy ink cap or Lawyer's wig (*C. cornatus*);
11. Blewits (*Lepista*), including Wood blewit (*L. nuda*), with its pink spores; and
12. Web Caps (*Cortinarius*), with over 200 species, which have rust-coloured spores and a veil between the cap and stem when young.



Death cap



Parasol



Trooping funnel



Shaggy ink cap



Web cap

The talk concluded with more illustrations of different types of fungi.



Earth Star
Geastrum triplex



Beefsteak Fungus
Fistulina hepatica



Green Wood-cup
Chlorosplenium aeruginascens