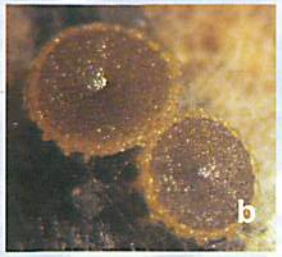
Some fungi can live off dung



Coprophilous (dung) fungi help to break down the dung of animals, especially herbivores. Under the right conditions you can see a succession of fruit bodies produced by the different groups (phyla) of fungi emerging from a single sample of dung.

(a) Pilobolus crystallinus, (b) Ascobolus crenulatus and (c) Coprinus cordisporus photos credit: Mike Richardson

Fungi hold the record for the fastest speed in nature!

It is essential that the spores of dung fungi reach new plant material because any spores that remain in the dung will not be eaten. These fungi have devised clever strategies enabling them to release their spores over long distances and at rapid speed. *Pilobolus* (the hat thrower) shown in (a) points its spore 'cap' towards sunlight before releasing it at speeds of 25 ms^{-1} which is 400x faster than the blink of an eye! You can see the high speed discharge in action by viewing the following link: http://www.youtube.com/watch?v=TrKJAojmB1Y

The fruit bodies of some fungi rise from the ashes

The fruit bodies of *Morchella esculenta*, the Morel, appear in abundance on burnt ground! Photo credit: Harry Hudson

The fruit bodies of some fungi appear to 'rise from the ashes', as if by magic, following a forest fire. These fungi are sometimes referred to as 'Phoenicoid' fungi, from the word Phoenix, the mythical bird that would catch fire every five hundred years, only to rise again from the ashes of its predecessor.

The Phoenicoid fungi can also be referred to as 'fire loving fungi' (pyrophilous), 'coal inhabiting fungi' (carbonicolous) and 'coal loving fungi' (anthracophilous). This group of fungi is represented by members who produce mushrooms, cups, corals and underground (hypogeous) fruit bodies upon burnt ground.

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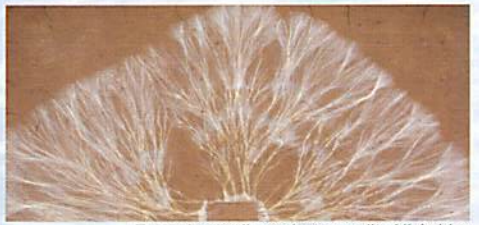
Fascinating Fungal Facts

The giant puff ball can grow larger than a football in just a few days

A pioneering mycologist called Reginald Buller estimated that a single giant puff ball (*Calvatia gigantea*) could make over 7 trillion spores which is enough for 1000 each for every person living on this planet!

Calvatia gigantea photo credit: Jean Deal

The largest living organism on the planet is a FUNGUS!



Fungal mycelium photo credit: Ali Ashby

By using DNA analysis, scientists have shown that the underground mycelium of *Armillaria ostoyae,* the Dark Honey fungus, which is growing in the Malheur National Forest , Oregon USA, has spread a distance of over 3.4 square miles! This makes it the largest living organism on the planet. However, its' fruit bodies (mushrooms), which appear in the autumn, weigh only about 100g each.

Some of the largest fruit bodies are produced by the bracket fungi

Inonotus dryadeus, the Oak Bracket, photo credit: Ali Ashby

Inonotus hispidus, the Shaggy Bracket, photo credit: Ali Ashby

A specimen of the bracket fungus *Rigidoporus ulmarius* growing in the Royal Botanic Gardens in Kew was found to weigh over 160kg (which is heavier than the combined weight of two adults!). The fungus was recorded in the 'Guinness Book of Records' as having the largest known fruit body of a fungus, until it was superseded by the endangered bracket fungus *Bridgeoporus nobilissimus* (the noble polypore).

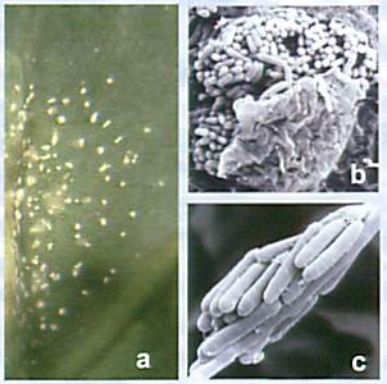
One centimetre squared of woodland soil contains one thousand centimetres of fungal mycelium

Scanning Electron Micrograph (SEM) of fungal mycelium
photo credit: Ali Ashby

The main body of a filamentous fungus is made up of a network of microscopic threads called hyphae which form a mycelium. A single hypha is a cylindrical structure of only 2-10 micro metres (µm) in diameter; however, their networks can extend over very large distances!

Fungal spores are like the 'seeds' of flowering plants – but unlike seeds, they are too tiny for us to see

(a) A close up of an infected brassica leaf showing the characteristic white spots caused by the rupture of the leaf by spore bearing structures produced by the plant pathogenic fungus *Pyrenopeziza brassicae*. These spore bearing structures are visible on the leaf surface as white spots, but when viewed under high power Scanning Electron Microscope (SEM) they are seen to contain thousands of spores (b). The spores themselves are between 10-16 µm long and 3-4 µm wide and are visible only with the aid of a microscope, seen here under SEM (c).



Light Leaf spot disease of brassicas
photos credit: Ali Ashby

The smallest fungi in the kingdom are single celled organisms and are microscopic

Photo credit: Neil Gow

The microscopic fungus *Candida albicans* is found in our mouths and stomachs and rarely causes harm. However, occasionally it can become aggressive and cause infections such as thrush.

Photo credit: Louise Walker & Neil Gow

The microscopic Chytrid fungus, *Batrachochytrium dendrobatidis* (Bd) is a major cause of amphibian decline throughout the world, along with other factors such as climate change and human dispersal.

Some fungi can glow in the dark!

Mycena arcangeliana the Angel's Bonnet photo credit: Ali Ashby

There are at least 70 different species of fungi that are known to emit light and seventy five per cent of them belong to the genus *Mycena*; a group of saprophytic fungi that feed off dead organic matter and recycle carbon and nitrogen back into the soil. Fungi that glow in the dark are called bioluminescent fungi.

The rhizomorphs of *Armillaria* sp. glow in the dark

Rhizomorphs photo credit: Ali Ashby

Armillaria mellea, the 'honey fungus' produces specialised groups of hyphae called 'rhizomorphs' that can produce a greenish glow in the dark. It is said that in World War I, soldiers placed wood containing this fungus on their helmets to allow them to see their comrades in the trenches at night! This bioluminescent phenomenon may have been the inspiration behind 'Foxfire' in 'The Adventures of Huckleberry Finn' by Mark Twain.

Some fungi have gills that glow in the dark

The fruit body of the fungus *Lampteromyces japonicas* (found in Japan) has gills on the underside of its' mushroom cap that can glow in the dark.

Watch it glow by going to the following link:
http://vidiowiki.com/watch/aedkcer/Lampteromyces_japonicus

Lampteromyces japonicas photo credit: Patrick Hickey