



Encyclopedia of Life

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## Fungi Podcast and “Meet the Scientist”

*Sulfur tuft fungus; Cleft-footed amanita*  
*Hypholoma fasciculare; Amanita brunnescens*

This podcast begins with a riddle about a life form that’s all around us, yet rarely seen. Working under cover, it sends its ghostly tendrils into almost every corner of the terrestrial world. learn how this mysterious form of life, neither animal nor vegetable, shapes our world.

### Transcript

**Ari:** From the Encyclopedia of Life, this is One Species at a Time. I’m Ari Daniel Shapiro.

I’m pretty sure you haven’t heard this one before. What is all around us and very hard to see, and both dismantles and shapes our world?

**Boddy:** Let’s have a little look for another log.

**Ari:** Lynne Boddy – an ecologist from Cardiff University in Wales – is the one who gave me the idea for the riddle. She’s shuffling through the leaves in a little patch of forest in Concord, Massachusetts.

**Boddy:** Oh, look at this.

**Ari:** She’s spotted a soft birch tree log lying on the forest floor. Boddy kneels down and starts tugging on the log.

**Boddy:** We’ve turned over this log. Can you see this?

**Ari:** Oh, yeah!

A few limp, cream-colored threads descend from the rotting log and make their way into the soil. They look like plant roots to me. But I’m wrong.

**Boddy:** What we’re looking at is the main part of a fungus. Most of us think of fungi as things like mushrooms and toadstools. But that’s just the tip of the iceberg. That’s the fruit body, and

the fruit bodies are like the flowers of flowering plants. There's another part of the fungus – it's usually hidden in rotten wood and in the leaf litter on the forest floor.

**Ari:** They're really helping to kind of connect this rotting wood to the soil.

**Boddy:** That's exactly right. They are.

**Ari:** These fungal threads – or mycelia – are doing the work of decomposition, slowly digesting and feeding upon this birch tree. One example is the sulphur tuft fungus –

**Boddy:** *Hypholoma fasciculare*.

**Ari:** – an organism that grows both in the US and in Britain. Boddy isn't sure which species she's found emanating from this birch tree, but she gingerly holds its mycelium and begins tracing it through the soil.

**Boddy:** Oh my goodness. It's attached to an acorn from this oak tree. So it's not only decomposing the wood of the birch tree, but it's decomposing this old acorn.

**Ari:** A little farther along, the fungal threads have grabbed a hold of another little acorn hat, crawled along its perimeter, and surged out the other end in search of something else to colonize – a branch, a tree stump, or another log. Nutrients consumed in one part of the fungi get routed into this vast, interconnected mycelial network. And if one part of the network gets chewed up by a wood louse, say, or stomped through by a deer, it's no big deal for the fungus. It's so interconnected that there's little risk of chopping one of these fungi in two.

Boddy loses the trail when the mycelia plunge straight down into the soil. But this fungal tapestry doesn't just carpet the forest floor.

**Boddy:** In all of these trees that you see around us, there are fungi within the trunks and branches, not doing very much – just tiny, tiny, little pockets. And then the minute that the water in the sapwood in these trees stops flowing, these fungi will grow into bigger mycelia and start the decay process. So the minute this tree comes down or even before, decay has started. Then spores will land, and they will try to get in, and it will have landed on a network of cords on the forest floor. And that fungus will get in too. And so we have a battle going on in this wood.

**Ari:** A greedy battle over the nutrients locked up inside the newly dead tree.

So that's one portrait of the fungal community – lying in wait, wood-thirsty, and skirmish-prone. But there's another side to fungi. The benevolent side, and the second half of the riddle – what not only dismantles, but also shapes our world...

**Boddy:** None of these plants in this beautiful woodland would not be here if it were not for fungi for two very good reasons. One is that the fungi, which are decomposing actually release the nutrients that are locked up. Those nutrients can then be used by the trees around. And the second reason is that all of these plants, every single one of these plants around us have fungi attached to their roots.

**Ari:** These mycorrhizal fungi – species like *Amanita brunnescens* here in this woodland – associate with 90% of the plants on Earth. They ensheath the roots. Or sometimes they grow in between root cells. These fungi absorb water and nutrients from the soil, and share them with the plant. In exchange, the fungi get some of the sugars pulsing through the plant roots.

**Boddy:** It's plants plus fungi that make the ecosystems of our planet work.

**Ari:** Plants are, I mean, I think of them as independent beings, you know, they just need the sun in order to survive, but you're saying that they wouldn't stand one minute without fungi.

**Boddy:** That's absolutely true.

**Ari:** In fact, Boddy says that plants needed fungi to be able to colonize land 450 million years ago.

So fungi both nourish and destroy. They pump vital fluids into the very ecosystems that other fungi will later carve up and consume. They digest the dead, leaving behind the raw materials for new life to be born. And it just takes getting your hands a little dirty to trace the weave of their vast network.

**Boddy:** Ok, look here. Now, oh, that's interesting, isn't it.

**Ari:** Check out [eol.org](http://eol.org) to see a couple photos of Lynne Boddy, and to hear about how even bacteria take advantage of fungi.

**Boddy:** Some bacteria actually move along fungi in soil almost as if they're moving along a motorway.

**Ari:** Our series, *One Species at a Time*, is produced by Atlantic Public Media in Woods Hole, Massachusetts. I'm Ari Daniel Shapiro.

## Meet the Scientist

Meet scientist Lynn Boddy, featured in our fungi podcast:



### ***Where do you work?***

School of Biosciences, Cardiff University, UK.

### ***What do you study?***

I am a decomposition ecologist concentrating mainly on wood decay fungi, especially community development, their interactions with other fungi, bacteria and invertebrates, and the behaviour of mycelial networks.

### ***What are three titles you would give yourself?***

Ecologist, communicator, optimist.

### ***What do you like to do when you are not working?***

I am keen on, though not very good at, karate, cycling, yoga and keeping fit. Then, when I am worn out I like to read thrillers, who dunnits, sci-fi and historical novels.

### ***What do you like most about science?***

I love the excitement of finding out something new about what fungi do in the natural environment. It is great having a job that is such great fun, and utterly fascinating.

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The One Species at a Time podcast series is supported by the Harvard Museum of Comparative Zoology.