

Science notes

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A day in the life ... of a mycologist

David Moore

Wake up. Shave and shower, sharing the bathroom with a few fungi. Just the odd mildew where the corners stay damp, but they need to be cleaned away regularly.

Dress. Favourite shirt's bright colours come through the wash thanks to those fabric conditioners derived from fungi.

Then I pull my blue jeans on. I pull my old blue jeans on. Actually, they are new, stylishly stone-washed denim. So not old blue jeans at all. And not washed with stones, either. The fabric gets its distressed look from treatment with fungal enzymes.

Breakfast. Cornflakes and milk – the corn, like most other plants, needs mycorrhizal fungi to make its roots work, and cows need fungi in their stomach to digest grass. Fruit juice – yield increased and juice clarified with fungal pectinases. So breakfast depends on fungi. As usual.

Lunch. Cheese salad sandwich. Baking the bread depends on yeast, and where would salad crops be without the biocontrol of pests by fungal pathogens? Cheese is another thing that depends

on fungal enzymes – to coagulate the proteins in milk. I particularly like a Danish Blue cheese, which obviously further depends on a mould to mature it. I cheat on the diet with a fizzy drink. Naughty, but refreshing. Of course, the fizz needs citric acid to keep the bubbles bubbling; and industrial production of citric acid uses a fungal fermentation process. So lunch depends on fungi. As usual.

On the way home. Drop into the pharmacy to collect Dad's pills. Statins. Wonderful things; keep him alive, and a lot of other people, too. Another thing to thank fungi for! But my family is used to that. Dad's sister, Bertha, has been taking cyclosporin since her transplant a few years ago. Cyclosporin is a fungal metabolite, too.

Dinner. Lamb chop (sheep, like cows, are also dependent on fungi to digest the grass they eat) with a few choice mushrooms and a range of fresh vegetables. Ironically, the most widely used fungicides in agriculture are strobilurins, so the vegetables have been kept mean and healthy with chemicals that are themselves produced by fungi. Interesting. Finished off the meal with a glass of



Figure 1 Fungi in your everyday life: yeast leavens your bread, *Aspergillus* makes citric acid for your fizzy drinks, chytrids help cows digest grass, *Penicillium* flavours your cheese, and *Fusarium* makes Quorn®.

wine. Nice Californian Merlot. Alcohol, whether beer, wine or spirit, is a yeast fermentation product. So dinner depends on fungi. As usual.

Late in the evening. Settle down with a mug of drinking chocolate – the flavour of which is produced by a fungal fermentation immediately after the cocoa pods are harvested. Pick up the QCA file to start planning educational projects for next semester. Now, isn't that peculiar? The National Curriculum for England, I mean. Like everyone else I know, I use fungi and fungal products every day of my life. We all depend on them for so many things. We wear them, eat them, drink them. Some keep us alive. In nature, fungi have an important role in every ecosystem and every food chain on the planet.

But the National Curriculum is the one place it's difficult to find fungi!

Fungus in the curriculum

The word 'fungus' does not appear in the 87-page National Curriculum programme of study for science (1999), which is the statutory instrument that defines the curriculum for key stages 1–4 (ages 5 to 16), and the same applies to the revised 2006 curriculum. But it is not just the case that the National Curriculum ignores fungi; rather they seem to be actively excluded right across the age range. The current specifications all contain material on animal and plant comparisons with little or no consideration for the largest group of higher organisms on Earth: Kingdom Fungi.

To try to compensate for this educational deficiency, mycologists like me in the British Mycological Society have recently published a

range of classroom-tested teaching resources. These include:

- class sheets dealing with cells and cell biology, which ensure proper representation of both yeast and filamentous fungus;
- a series of five ready-made key stage 4 (ages 14–16) lessons (that include class sheets for pupil and teacher) comprising an introductory *Welcome to the world of fungi*, *Reproduction and conservation*, *Favourite or nastiest fungus*, *Fungi and industry* and *Fungi and disease*;
- a series of class sheets describing 15 different 'What's your favourite fungus?' stories from which the pupils extract important points, a pack of playing cards that mirror the class sheets and can be used to play a variety of games (and all the time the players are holding cards that each carry a different 'fungal fact'), and a 'name-game' starter exercise.

The key stage 4 resources have been printed as a package that is available free from the author at the address below, and all worksheets and classroom materials, which range in suitability from primary level to post-16, can be downloaded (free again!) from the British Mycological Society's new educational website (see below). Visit the site; look around – there's a painting course, answers to frequently asked questions, advice about fieldwork, advice about photography, interactive books, photographs, presentations, posters, and lots more. And most of the resources are copyright-free for educational use. If you want more, tell us. We will make it for you.

Website

British Mycological Society educational website: <http://www.fungi4schools.org/>

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