

## A Brief Note on Fungal Biodiversity

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### Commentary

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### ABOUT THE STUDY

Fungi are eukaryotic microorganisms that come in a wide range of sizes, shapes, and complexity. Mycelia of terrestrial fungus have a branching design and indeterminate growth that allows them to explore enormous soil volumes and use heterogeneous and patchily scattered organic substrates. Various mycelial structures optimise this activity while also providing a resilient resting stage in adverse conditions.

Fungi have a wide range of effects on humans, thus it's crucial to understand them in order to be able to manage or utilise them for our own benefit. More than 90% of known fungal species, for example, have never been tested for antibiotics or other valuable chemicals. However, the importance of fungi in the ecology cannot be overstated. They are significant in both grassland and forest habitats as decomposers and pathogens, and they play a key role in the food chain. Fungi have a wide range of relationships with other living and dead creatures. We need to study a lot more about fungi in order to understand their impact on our lives.

Many fungi are detrimental to human health. Mycotoxins and mushroom poisons, for example, can cause human disease either directly or through their toxins.

They can also make plants and animals sick (e.g., crops, fruit trees, farm animals). Fungi are frequently responsible for food rot and contamination; most of us have something green and mouldy lurking in the back of our refrigerator right now. With the exception of some plastics and insecticides, they may damage practically any produced good.

Many fungi, on the other hand, are extremely beneficial to humans. There are numerous edible mushrooms, of course. For millennia, yeast has been utilised in baking and brewing. Fungi produce antibiotics such as penicillin and cephalosporin. The ascomycete *Tolypocladium inflatum* produces the immunosuppressive antirejection transplant medication cyclosporine. Various fungi commercially manufacture steroids, hormones, and even birth control pills. Many organic acids are commercially manufactured by fungus; for example, citric acid is produced by an *Aspergillus* species and is used in cola and other soft drinks.

Certain *Penicillium* species are used to ferment gourmet cheeses like Roquefort and other blue cheeses, brie, and camembert. Stone-washed jeans are softened by *Trichoderma* species, not by old ladies in babushkas beating the jeans on rocks in a stream, as weird as that may sound. There are certainly many more possible applications that have yet to be discovered. Fungi are useful experimental creatures as well. They are simple to culture, take up little room, reproduce quickly, and have a brief life cycle. Because they are eukaryotes, which are more closely linked to animals than bacteria, their study is more useful to human problems. Fungi are utilised in metabolite research, growth, development, and differentiation research, cell division and development mechanisms research, and vitamin and amino acid microbial assays. Fungi are also essential genetic tools in 1958, the Nobel Prize for Physiology or Medicine was awarded to George W Beadle and Edward L Tatum for their theory of "one gene, one enzyme" in *Neurospora*. *Saccharomyces cerevisiae*, the baker's and brewer's yeast, was the first eukaryotic genome to be sequenced. In 2001, Lee Hartwell and his colleagues won the Nobel Prize for their work on mitotic genes using *Saccharomyces cerevisiae*.