

Editorial

Fungi play a critical role in global carbon cycle

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EDITORIAL NOTE

Mycology is the branch of biology concerned with the study of fungi, including their genetic and biochemical properties, their taxonomy and their use to humans as a source for tinder, traditional medicine, food, and entheogens, as well as their dangers, such as toxicity or infection. A biologist specializing in mycology is called a mycologist. Mycology branches into the field of phytopathology, the study of plant diseases, and the two disciplines remain closely related because the vast majority of plant pathogens are fungi.

Many fungi produce toxins, antibiotics, and other secondary metabolites. For example, the cosmopolitan (worldwide) genus *Fusarium* and their toxins associated with fatal outbreaks of alimentary toxic aleukia in humans were extensively studied by Abraham Joffe. Fungi are fundamental for life on earth in their roles as symbionts, e.g. in the form of mycorrhizae, insect symbionts, and lichens. Many fungi are able to break down complex organic biomolecules such as lignin, the more durable component of wood, and pollutants such as xenobiotics, petroleum, and polycyclic aromatic hydrocarbons. By decomposing these molecules, fungi play a critical role in the global carbon cycle. Fungi and other organisms traditionally recognized as fungi, such as oomycetes and myxomycetes (slime molds), often are economically and socially important, as some cause diseases of animals (including humans) and of plants. Apart from pathogenic fungi, many fungal species are very important in controlling the plant diseases caused by different pathogens. For example, species of the filamentous

fungal genus *Trichoderma* considered as one of the most important biological control agents as an alternative to chemical based products for effective crop diseases management. Field meetings to find interesting species of fungi are known as 'forays', after the first such meeting organized by the Woolhope Naturalists' Field Club in 1868 and entitled "A foray among the funguses".

Some fungi can cause disease in humans and other animals. The discovery of the connection of microorganisms to disease can be dated back to the nineteenth century, when German physician Robert Koch introduced the science of microorganisms to the medical field. He identified bacteria as the cause of infectious diseases and process of fermentation in diseases. French scientist Louis Pasteur developed techniques to produce vaccines. Both Koch and Pasteur played a role in improving antisepsis in medical treatment. This had an enormous positive effect on public health and gave a better understanding of the body and diseases.

It is believed that humans started collecting mushrooms as food in prehistoric times. Mushrooms were first written about in the works of Euripides (480-406 BC). The Greek philosopher Theophrastus of Eresos (371-288 BC) was perhaps the first to try to systematically classify plants; mushrooms were considered to be plants missing certain organs. It was later Pliny the Elder (23-79 AD), who wrote about truffles in his encyclopedia *Naturalis historia*.

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