

Economic Importance of Fungi

Fungi are economically important organisms, there are some fungi which are beneficial while some other are harmful to mankind and other organisms.

Beneficial Aspects of Fungi

- Fungi as a food: Certain species of fungi (Mushrooms) like *Agaricus*, *Letinus*, *Valvariella* and *Termitocites* are edible. Mushroom cultivation for food is well known these days, because of their large protein content and being a good source of vitamins and minerals.
- Antibiotics from fungi: Antibiotics are chemicals produced by some living organisms which have potential to kill bacteria. Alexander Flemming (1944) for the first time extracted antibiotic drug Penicillin from *Penicillium*. Later on many other fungi were discovered which produce antibiotics. Some of them are *Trichoderma*, *Chaetomium* and *Armillariella*. Streptomycin is produced from *Streptomyces gracesus*. Amoxoceline is also produced from fungi.
- Fungi as a source of Medicine: *Saccharomyces* and other yeast are the good sources of vitamins B-complex and riboflavin. These are used as medicine. Similarly, many fungi produce ergosterol which contain Vitamin D. *Aspergillus* and *Penicillium* are used in the production of organic acids like gallic acid, fumaric acid, citric acid etc.
- Fungi for Alcohol Fermentation: Use of fungi like Yeast in brewing and baking industry is universally known. Both these industries are based on the fact that fermentation of sugar produced ethyl alcohol and CO₂. Alcohol is important product of brewing industry whereas in bread making carbon dioxide is useful which makes bread spongy. *Aspergillus oryzae* is used in the preparation of wine from rice while yeast is used in the preparation of beer from cereals, grapes, mahua.
- Fungi as decomposer: Fungi like *Trichoderma*, *Penicillium* decomposes the dead and decaying matter and play role as decomposer in ecosystem.
- Mycorrhizal Association: A symbiotic relationship between the hyphae of fungi and root of higher plants called Mycorrhiza. In majority of tree roots are surrounded by fungal hyphae of genera like *Boletus*, *Phallus*, *Tricholoma*, *Scleroderma* etc. These enhances the growth of plants by uptaking nutrients like phosphorus, calcium, potassium etc.
- Mycoremediation: It is a form of bioremediation. The process of using fungi to degrade or sequester contaminants in the environment. Some fungi are hyper accumulators, capable of absorbing and concentrating heavy metals in the mushroom fruit bodies.

- Fungi as insecticides: several fungi are endoparasites on insects and other small arthropods such as mites and spiders. These fungi are utilized for controlling plant pests and insects.

Harmful Aspects of Fungi

Fungi are harmful to human beings in various ways either directly or indirectly. They may cause diseases to plants, animals and even human beings. Some times they spoiled food or paper or cloth etc.

- Diseases to Human: The most common place of fungal infection is skin. However, other body parts like respiratory tract, lungs, bones, viscera, intestine, liver, kidney, nasal sinuses, cornea tissue of eye etc are also sometimes severely affected. Some species of *Rhizopus* and *Mucor* infects lungs, brain and gastric tissues, whereas *Neurospora* and *Fusarium* infects Cornea tissue of the eyes. *Histoplasma* infects liver, kidney and nervous system. Some common disease caused by fungi are Ringworm of skin and nail by *Trichophyton* sp., *Microsporum* sp. Infection to ear by *Aspergillus nidulus*, Allergy by *Alternaria* sp. *Phoma* sp.
- Diseases to Wild Animals: Just like man, fungal diseases are common in domestic and wild animals, for eg. *Microsporum* causes ringworm to dogs and horses, *Aspergillus fumigatus* causes diseases to birds, ducks and chickens. Many fishes, molluscs, and crustaceans which form a food crop of many people in the world are also infected by fungi. For eg. *Ichthyophorus* is called as fish destroying fungi.
- Spoilage of food and stored grains: Food articles if not properly stored are spoiled by fungi. Exposure of bread and other articles even for a few minutes, make them infected. Common food spoiling fungi are *Aspergillus*, *Rhizopus*, *Mucor*, and *Penicillium*. Some fungi contaminate the stored harvested grains. The infected grains of wheat maize etc contain hyphae of fungi beneath seed layer. Jellies and Jams are also found infected with fungi.
- Poisonous Fungi: Some fungi are deadly poisonous. If ingested they may prove fatal. Eg. *Amanita*. Some mushrooms include *Galeria*, *Coprinus* are also found poisonous and may result even in death.
- Fungi Causing Plant Diseases: Many crop plants are infected by one or other fungi. The common fungal diseases are smuts, rusts, mildews, blights, rots and wilts. Fungi cause several plant diseases like Rust of Wheat by *Puccinia graminis*, Rust of Brassica by *Albugo candida*, Tikka disease of Groundnut by *Cercospora* sp.
- Destruction of Timber and other goods: Species like *Polyporus* are common woodrotting fungi. Fungi like *Alternaria*, *Trichoderma* *Chaetomium* destroys paper, rubber, leather etc