

The decomposing and symbiotic characteristics of fungi are highly important to all ecosystems

- ❑ Fungi and bacteria are the principle decomposers that keep ecosystems stocked with the inorganic nutrients essential for plant growth.
- ❑ Without decomposers, carbon, nitrogen, and other elements would become tied up in organic matter.
- ❑ In their role as decomposers, fungal hyphae invade the tissues and cells of dead organic matter.
 - Exoenzymes hydrolyze polymers.
- ❑ A succession of fungi, bacteria, and even some invertebrates break down plant litter or corpses.
- ❑ But sometimes the aggressive decomposition by fungi can be a problem.
 - Between 10% and 50% of the world's fruit harvest is lost each year due to fungal attack.
 - Ethylene, a plant hormone that causes fruit to ripen, also stimulates fungal spores on the fruit surface to germinate.
- Fungi do not distinguish between wood debris and human structures built of wood.

Some fungi are pathogens

- ❑ About 30% of the 100,000 known species of fungi are parasites, mostly on or in plants.
 - Invasive ascomycetes have had drastic effects on forest trees, such as American elms and American chestnut, in the northeastern United States.
 - Other fungi, such as rusts and ergots, infect grain crops, causing tremendous economic losses each year.
- ❑ Some fungi that attack food crops produce compounds that are harmful to humans.
 - For example, the mold *Aspergillus* can contaminate improperly stored grains and peanuts with aflatoxins, which are carcinogenic.
 - Poisons produced by the ascomycete *Claviceps purpurea* can cause gangrene, nervous spasms, burning sensations, hallucinations, and temporary insanity when infected rye is milled into flour and consumed.
 - One epidemic in about 944 A.D. killed more than 40,000 people in France.
 - One of the hallucinogens that has been isolated from ergots is lysergic acid, the raw material from which LSD is made.
 - On the other hand, some toxins extracted from fungi have medicinal uses when administered at weak doses.
 - One type of ergot compound is helpful in treating high blood pressure and stopping maternal bleeding after childbirth.

- ❑ Animals are much less susceptible to parasitic fungi than are plants.
 - Only about 50 fungal species are known to parasitize humans and other animals, but their damage can be disproportionately large compared to their taxonomic diversity.
- ❑ The general term for a fungal infection is **mycosis**.
 - Infections of ascomycetes produce the disease ringworm.
 - This infection is known as athlete's foot when it grows on the feet.
 - Inhaled infections of other species can cause tuberculosis-like symptoms.

Fungi are commercially important

- ❑ In addition to the benefits that we receive from fungi in their roles as decomposers and recyclers of organic matter, we use fungi in a number of ways.
 - Most people have eaten mushrooms, the fruiting bodies (basidiocarps) of subterranean fungi.
 - Truffles, which are the fruiting bodies of certain mycorrhizal ascomycetes, are prized by gourmet chefs for their complex flavors.
 - The distinctive flavors of certain types of cheese come from the fungi used to ripen them.
 - The ascomycete mold *Aspergillus* is used to produce citric acid for colas.
- ❑ Yeasts are important in food production.
 - Yeasts are used in baking, brewing, and winemaking.
- ❑ Contributing to medicine, some fungi produce antibiotics used to treat bacterial diseases.
 - In fact, the first antibiotic discovered was penicillin, made by the common mold *Penicillium*.