

■ You decide

■ Pathogen or Saprophyte

# Endophytes

Most, if not all, plants studied in natural ecosystems are infested by fungi that cause no disease symptoms.

# Mutualism

Both species benefit from the interaction.



**Mutualism** – two species provide resources or services to each other → enhances fitness of both species

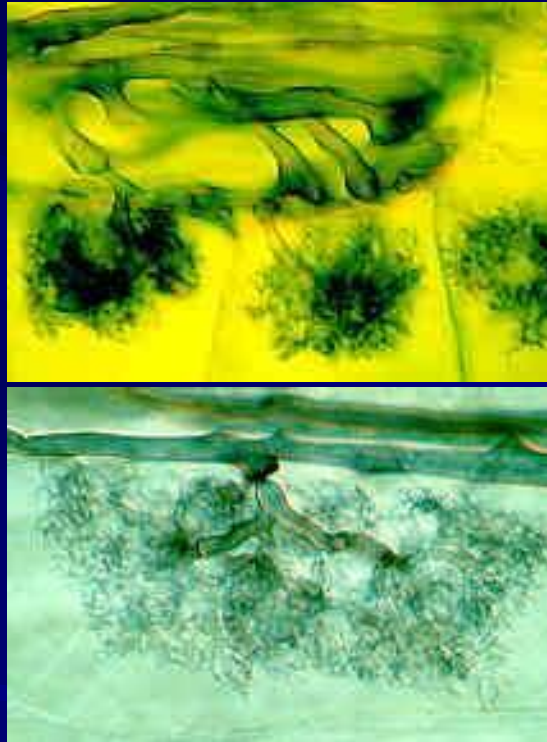


Algae and Fungi > Lichen - Alga gets water and nutrients from the fungus and the fungus gets food from the algae.

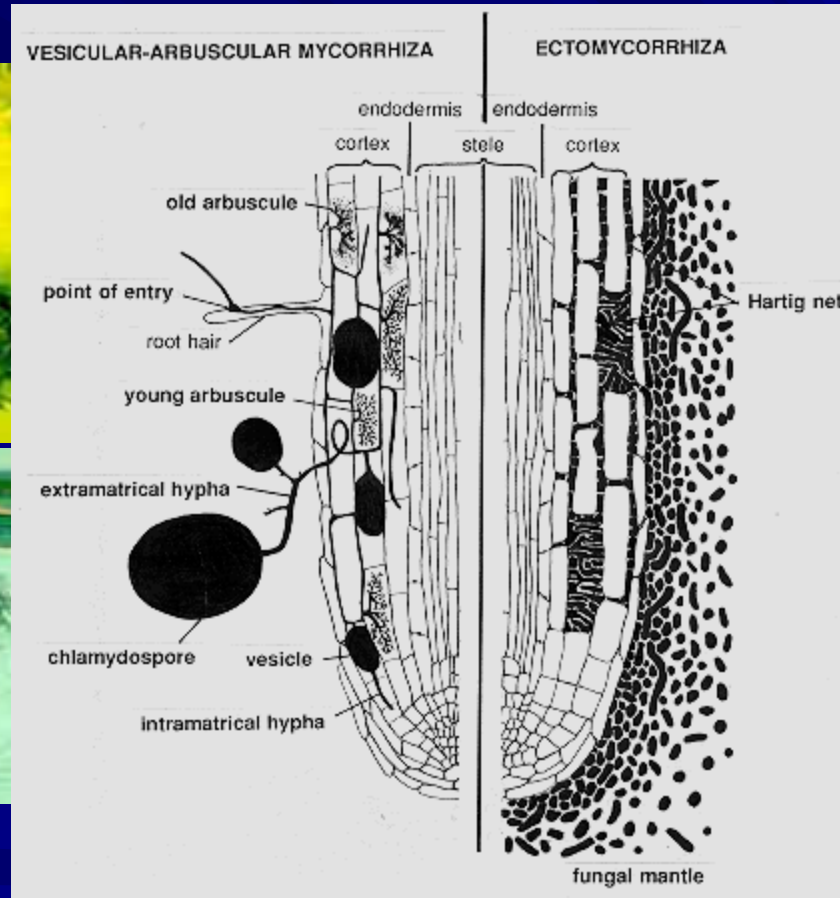


# Mycorrhizae – predominant forms

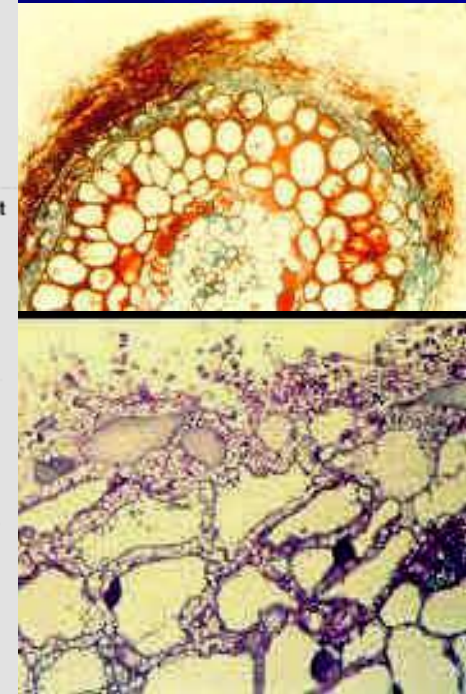
Zygomycete affinities



Direct penetration of tissues and cells



Asco/basidiomycete affinities



Root cells are surrounded but not invaded

# Commensalism

Commensalism is a relationship between two living organisms where one benefits and the other is neither harmed nor helped.



**Commensalism** – one species receives a benefit from another species → enhances fitness of one species; no effect on fitness of the other species





# Parasitism

One organism, usually physically smaller of the two (the parasite) benefits and the other (the host) is harmed



Insects such as mosquitoes feeding on a host are parasites.



# Some fungi are pathogens

- About 30% of the 100,000 known species of fungi are parasites, mostly on or in plants.
  - American elms:  
Dutch Elm Disease
  - American chestnut:  
chestnut blight



Was once one of America's most dominant trees



# Predation

one eats another (Herbivores eat plants.  
Carnivores eat animals.)





# Mode of nutrition

- **Pathogen or Saprophyte**

# MODE OF NUTRITION

- Mode of nutrition means method of procuring food or obtaining food by an organism.
- Autotrophic (green plants)
- Heterotrophic (fungi, bacteria)

Heterotrophic nutrition is of three types which are as follows :

- Saprophytic Nutrition
- Parasitic Nutrition
- Holozoic Nutrition



# HOLOZOIC NUTRITION

- Holozoic nutrition means feeding on solid food.
- The holozoic nutrition is a nutrition in which an organism takes the complex organic food materials into its body by the process of ingestion, which is subsequently digested and absorbed.
- Example – Amoeba, frog, human beings.

# PARASITIC NUTRITION

- The word para means others.
- The parasitic nutrition is a nutrition in which an organism derives its food from the body of another living organism(called its host).
- The organism which obtains food is called parasite and the organism from whose body food is obtained is called host.
- Example of parasite –roundworm in animals,  
*Phytophthora infestans*

# SAPROPHYTIC NUTRITION

- The word sapro means rotten.
- Saprophytic mode of nutrition is a nutrition in which an organism obtains its food from dead and decaying organic matter.
- Example- Fungi and bacteria
- Such organisms are called saprophytes.

# Decomposers (saprophytic fungi)



# Endophyte or pathogen

*Colletotrichum magna*, a fungal pathogen that causes anthracnose in cucurbit plants exerts an endophytic lifestyle when growing asymptotically on non-cucurbit species.

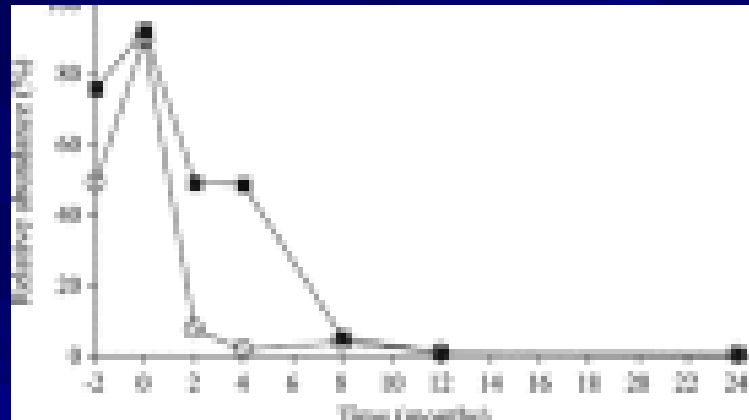
## **Entophytes**

**Plants have a large array of defense mechanisms that guard against entophytes and other fungi from becoming pathogens. These defenses include physical barriers like the tough cuticle lining the surfaces of plants or the bark on trees. Chemical barriers including various toxins and strong oxidizers may be utilized.**

**Entophytes >>>>>>> pathogens**

**When plant defenses are broken entophytes can become pathogens.**

# Fungal community on decomposition leaf litter



The rapid increase in fungal diversity after the litterfall was caused by the invasion of new colonisers

Health tissue>>>Infected tissue>>> Dead>>>Decomposed tissue  
Health host >>obligate pathogens>>non-obligate parasites>>>saprophytes





What goes in will not be that  
which come out.

