

The Fungi Kingdom

Mycology -the study of fungi

fungi - *plural*

fungus - *singular*

4 Main Characteristics of Fungi

1) fungi are **eukaryotic**

- they have a nuclei & membrane-bound organelles

2) they are **heterotrophs**

- they depend on other organisms for food

3) they are **multicellular**

4) they cannot move on their own

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4 Reasons Fungi Are Different From Plants

- 1) fungi lack chlorophyll
- 2) fungi are not photosynthetic
 - cannot produce their own food
 - most are saprophytes
 - some are parasites
- 3) they never reproduce by seeds
- 4) most fungi have cell walls made of chitin... *Except molds*
 - Plant cell walls are made of what?
cellulose
 - **molds** have cell walls made of cellulose...like plants

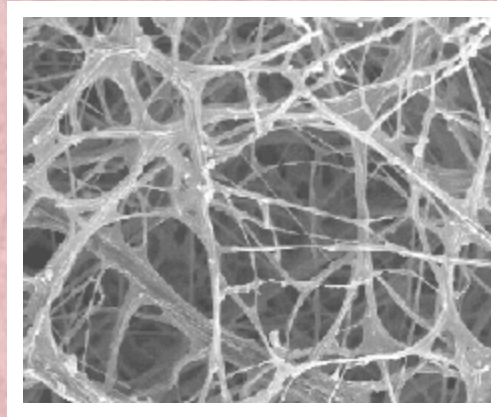
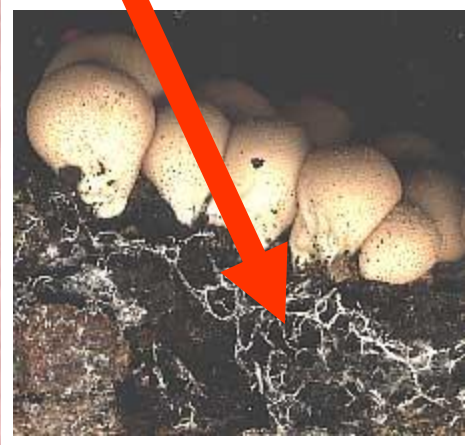
Saprophyte-
feeds on
dead/decaying
organisms



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Parts of fungi:

Hyphae - network of thin thread-like structures that form the “body” of a fungus



hypha - *singular*
hyphae - *plural*

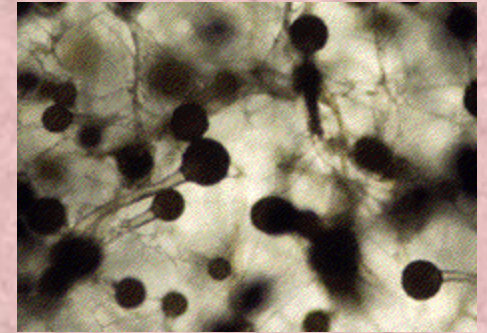
- hyphae contain cytoplasm
- hyphae grow and branch until they cover and digest the food source (upon which the fungi is growing)

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Parts of fungi:

Mycelium - a mass of hyphae

mycelia - *plural*

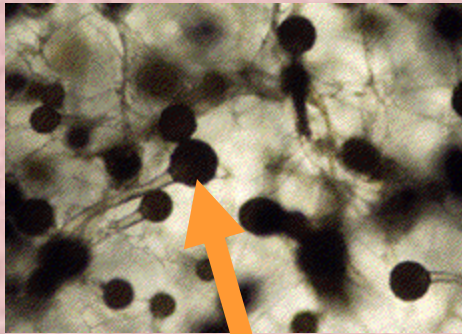


- The mycelium is usually hidden in the soil, in wood, or another food source

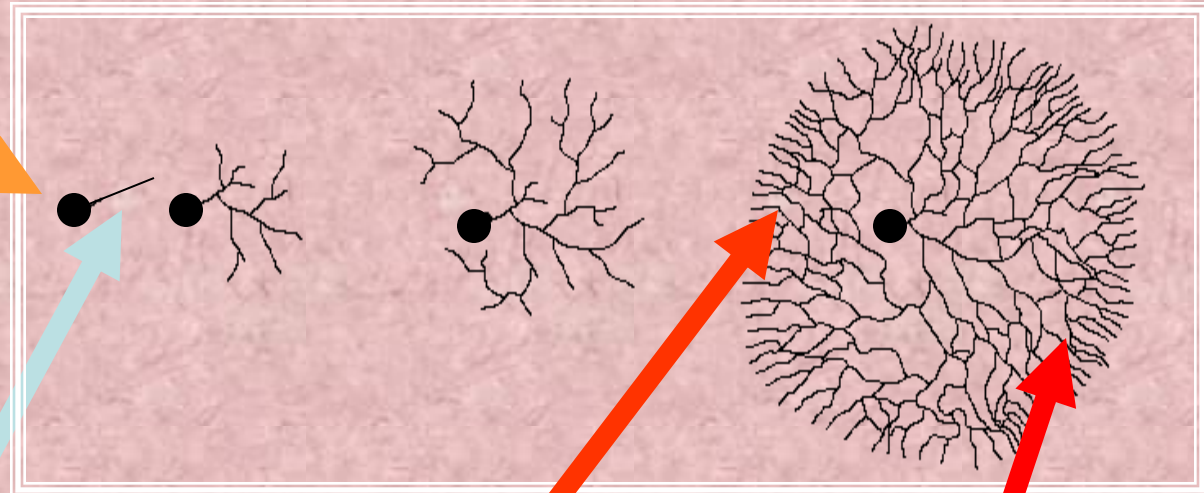
- A mycelium may fill a single ant, or cover many acres



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Germ tube
(Growing Spore)
(initial hypha)



single hypha

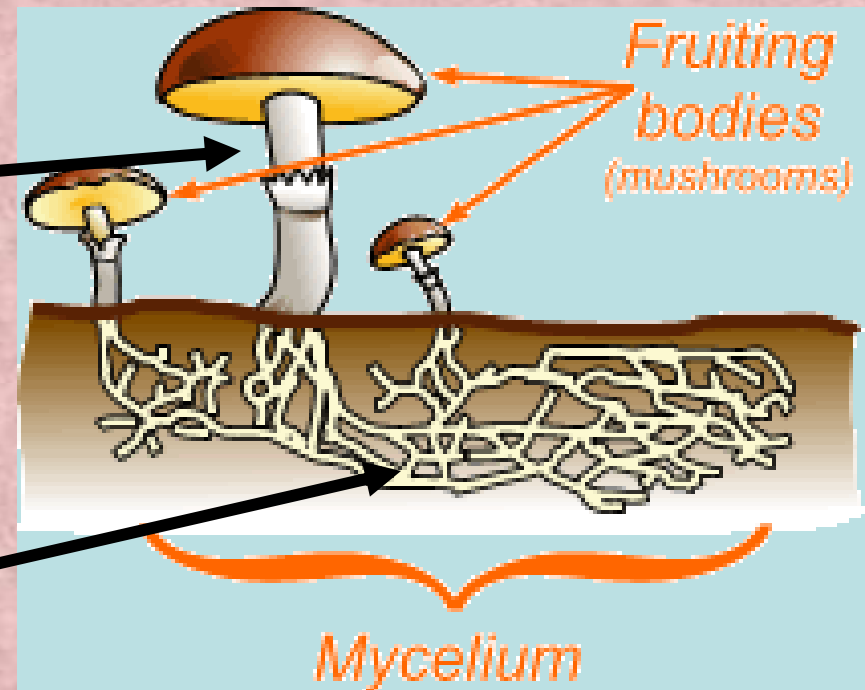
Mass of hyphae
(mycelium)

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**What are we looking at when we see a...
fungus-among-us?**

✚ The part of the fungus that we see is only the “fruit” of the organism

✚ The ‘living’ body of the fungus is a mycelium



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4 Main Types of Fungi:

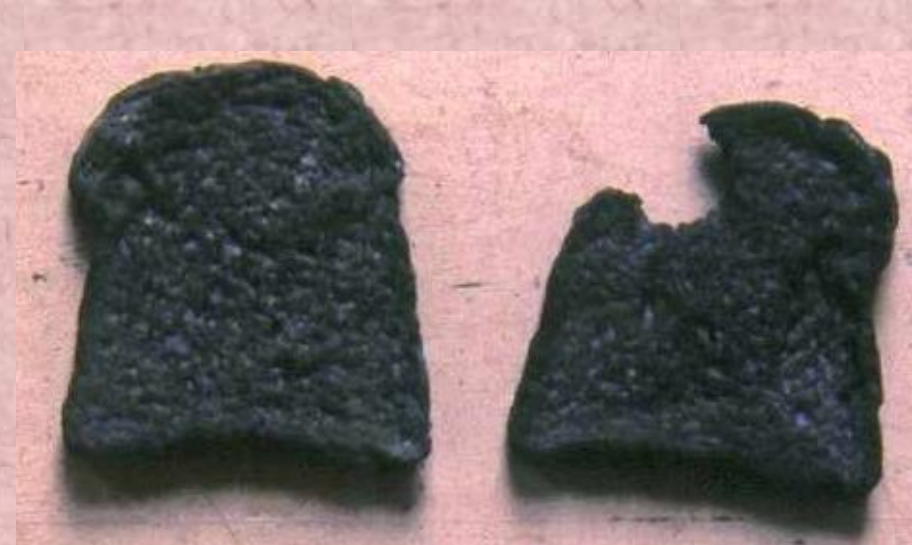
1. Zygomycota Sporangium Fungi/Mold

Sporangium fungi reproduces by spores in the sporangia

- Sporangia- structures found on the tips of hyphae that make spores

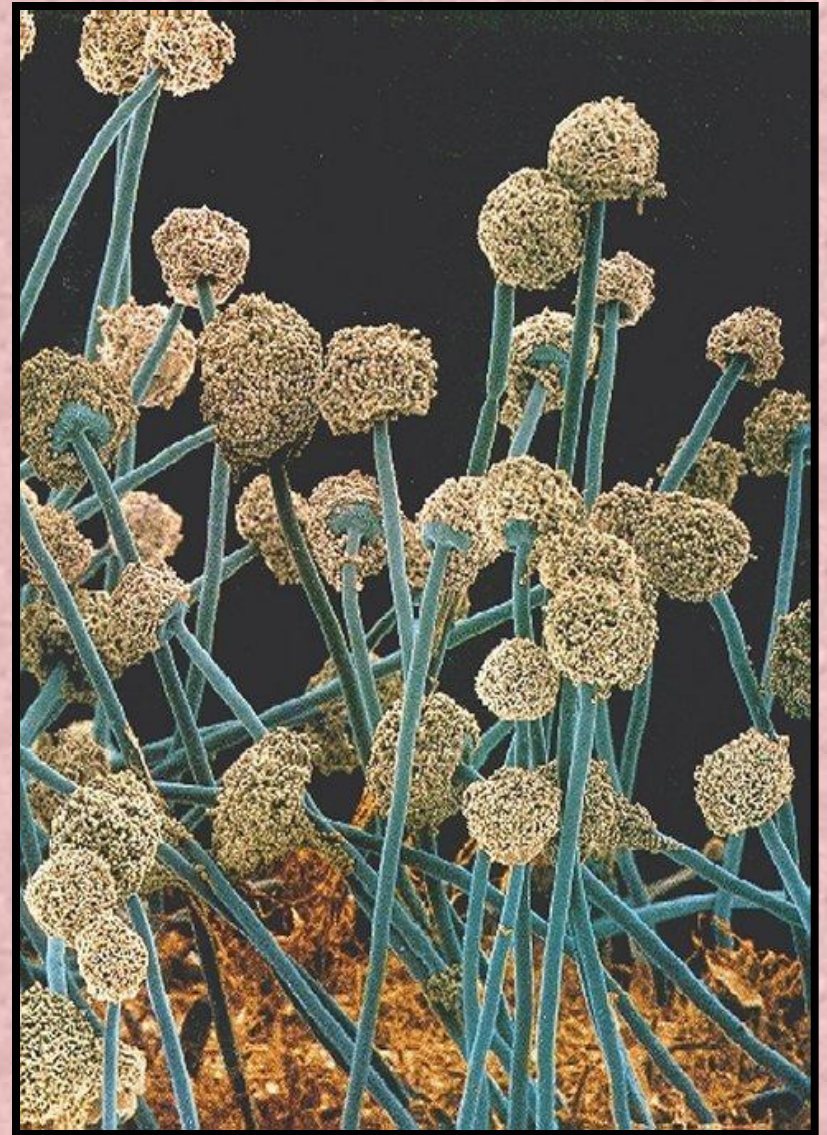
- EX: Bread Mold

- Bread mold produces spores in sporangia that stick up above the bread



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Rhizoids- hyphae of bread mold that digest bread



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4 Types of Fungi

2. **Basidiomycota** (Club fungi -)

have a club-shaped part which produces the spores

- Example: Mushrooms



3. **Ascomycota** (Sac Fungi) - produce spores in sac-like structures



EX: yeasts, cup fungi, powdery mildews, & lichens

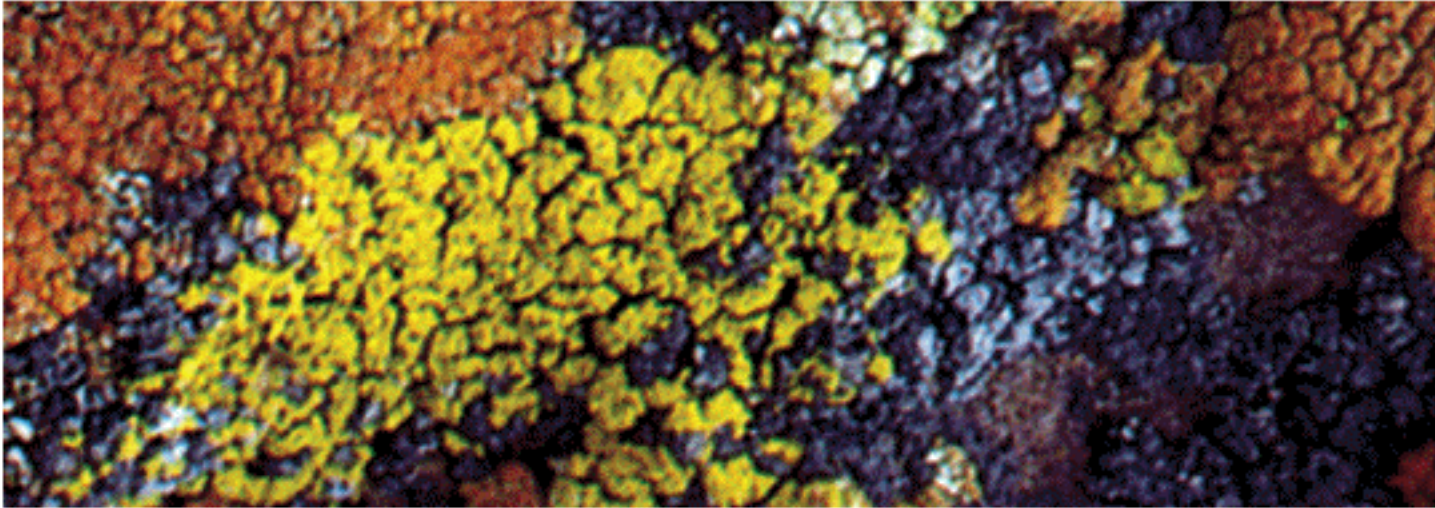
a fungus and an organism with

Lichens - chlorophyll (cyanobacteria or algae)
that live together

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Lichen morphology



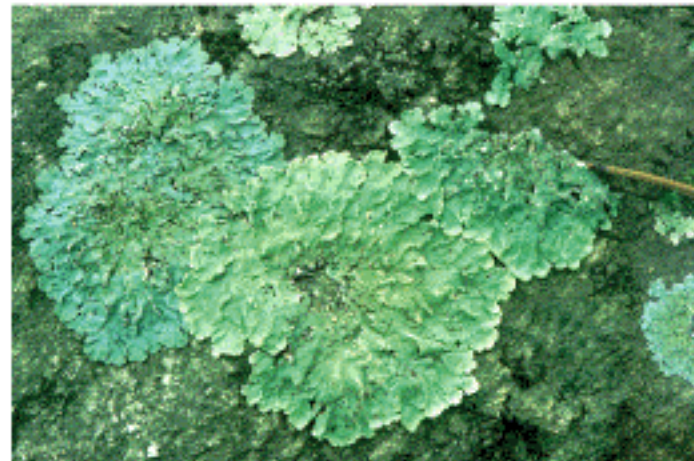
© Stephen Krasemann/Peter Arnold, Inc.

b. Mixture of crustose lichens



© John Shaw/Tom Stack & Assoc.

c. Fruticose lichen, *Cladonia*



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d. Foliose lichen, *Xanthoparmelia*

Crustose Lichen



Foliose Lichen



Fruticose Lichen



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4 Types of Fungi

4) **Deuteromycota** (Imperfect fungi) – sporangium/mold, sac, and club fungi that can **only** reproduce asexually

- cause most fungal diseases in humans

EX: ringworm, athletes foot, thrush



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Fungi Reproduction:

- the structure of the fungi that you can see, is the part that carries out reproduction
- most fungi reproduce by using spores
- fungi spores are microscopic

EX: Mushrooms & **puffballs (watch video...)**

release large clouds of spores. Each cloud contains millions of spores

Reproduction is classified according to:

- 1) the way they form the spores
- 2) the shape of the structure in which spores are made

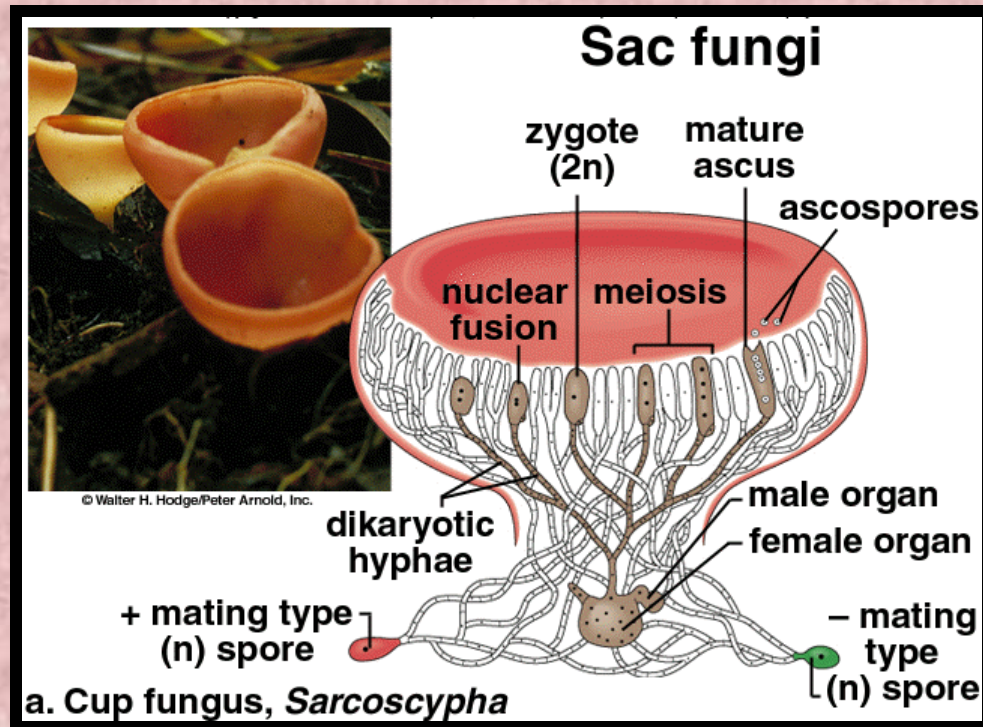
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Fungi Reproduction of 4 types of fungi:

1) Mold – reproduce asexually & sexually



2) Sac fungi – reproduce asexually & sexually



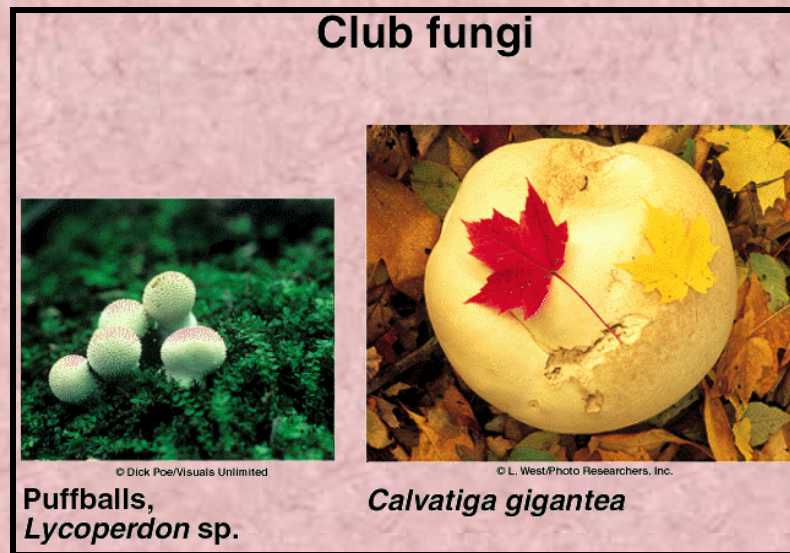
17.15 Fungi produce spores in both asexual and sexual life cycles

- Many fungal species can reproduce both sexually and asexually
- Fungi produce huge numbers of asexual spores, each of which can germinate to form a new fungus
- In many fungi, sexual fusion of haploid hyphae leads to a **heterokaryotic** stage, in which cells contain two genetically distinct haploid nuclei
 - Hours or centuries may pass before parental nuclei fuse to form a short-lived diploid phase
 - Zygotes undergo meiosis inside specialized reproductive structures and disperse haploid spores

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Fungi Reproduction of 4 types of fungi cont'd:

3) Club fungi – reproduce asexually & sexually



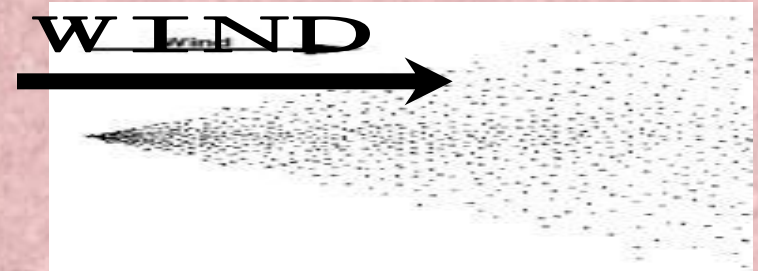
4) Imperfect – can only reproduce asexually

How Do Fungi Get Around Not Being Tall Enough?

 Fungi have a major problem:

Many fungi do not grow tall enough to clear the "boundary layer" of still air next to the ground so they...

1) Shoot their spores



2) Use animals, water or wind for dispersal

- Once spores are caught by something they can be carried long distances

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Fungi Reproduction Cont'd:

- Fungi can also reproduce from pieces of hyphae.
- Wind and water can carry pieces of hyphae to new places.
- If enough moisture and food is present, the spores/hyphae can grow into new fungi

Generalized life cycle of a fungus.

