

## What are fungi?

Singular = FUNGUS

Plural = FUNGI

A fungus is ...

Fungi are...

Origin of word fungus

Two schools of thought:

*sp(h)ongos* - Greek  
= sponge-like

*fungor* - Latin  
= to flourish

Both words probably relate to nature of fungal structures we call mushrooms or toadstools

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## Definition of Fungi

Eucaryotic, heterotrophic and absorptive organisms, which have cell walls, typically reproduce asexually and/or sexually by producing spores, and grow either reproductively by budding or nonreproductively by hyphal tip elongation.

Definition excludes:

1. bacteria & blue-green algae (prokaryotes)
2. slime molds
3. true algae & higher plants
4. animals
5. etc.

Definition may include some non-fungi

1. Oomycetes (water molds)
2. etc.

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### **No perfect definition**

1. Fungi historically have represented a very heterogenous grouping of unrelated or only distantly related organisms.
2. Adaptation of related or unrelated fungi or fungal-like organisms to similar ecological niches have led to structural trends that obscured fungal origins (phylogeny\*)

\* Phylogeny = evolutionary history of genetically related organisms

- A. Monophyletic - one origin
- B. Polyphyletic - multiple origins

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### **Trends in evolution that tended to obscure fungal nature (phylogeny)**

#### 1. Convergent Evolution

unrelated organisms superficially come to look alike

e.g. some fungi and colorless algae

#### 2. Parallel Evolution

members of unrelated groups evolve along similar paths

e.g. some fungi and animals, like slime molds

#### 3. Divergent Evolution

Related organisms come to have very different biology - they took different paths of evolution (adaptation)

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## Fungal nutritional types

### 1. Saprophytes

### 2. Symbionts

#### a. mycothallal fungi

e.g. lichens

#### b. mycorrhizal fungi

- ectomycorrhizal = can be free-living

- endomycorrhizal = obligate symbionts

#### c. animal-fungal partners

e.g. gut fungi

### 3. Pathogens

#### a. majority plant pathogens

#### b. many animal pathogens

#### c. relatively few but increasing # of human pathogens