

What are lichens?

Symbiosis

Intimate biological union of two different organisms

–*Mycorrhizae*—over 90% of plants have fungi growing on their roots

–*Lichens*—Relationship between algae & fungus that forms a “new” organism that bears no resemblance to either “parent.”

Symbiotic relationships form a continuum

Symbiotic relationships in lichens

One alga species + one fungus

–*Either green algae or cyanobacteria*

Two algal species + one fungus

–*both green algae and cyanobacteria, or two different green algae may be possible*

Lichen-forming fungi

Basidiomycetes

Ascomycetes

–*Over 200 genera, ~15,000 species*

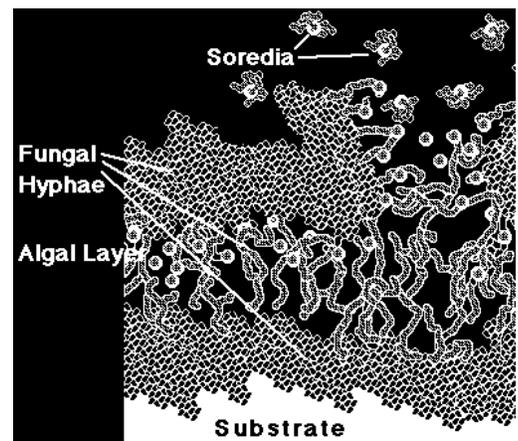
Major Categories of Ascomycetous Lichens

Crustose

Foliose

Fruticose

General anatomy of a lichen



Crustose lichens

Crust-like, flat, more or less prostrate,

Anchored to the substrate over all or most of their underside.

More or less firmly attached to the substrate by their bodies but not by rhizines;

Always lacking a lower cortex

Foliose lichens

Flat, more or less prostrate,

Anchored to the substrate over much or all of their underside.

–More or less loosely attached to the substrate, usually by rhizines;

Have a lower cortex.

Colour varies

–pale grey, yellowish green, dark green, light brown, dark brown, orange, red to almost black, depending on species.

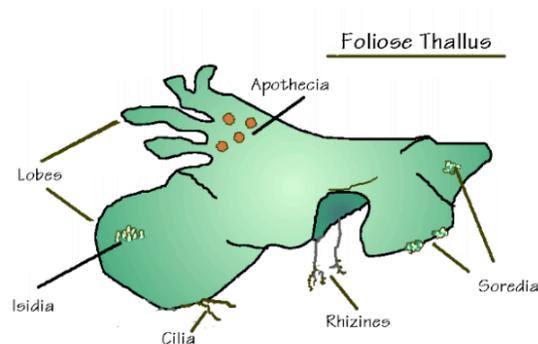
Generalized foliose lichen

Foliose lichens

Introduction to Lichen Morphology

Biodiversity After McCune's key in *Macrolichens of*

Unstratified gelatinous lichens



and
the PNW.

Stratified lichens

Have distinct algal layer

–Can see medulla and green layer with hand lens

–Rip lichen and view with hand lens

Fruticose lichens

Composed of an upright or hanging axis

Anchored at the base to the substrate

More or less round in cross-section,

Often found hanging from tree branches.

Lichen structures

Soredia

–Asexual reproductive structure that are algal cells coated with mycelium

Cephalodia

–Cyanobacteria-containing structures in lichens where the primary photobiont is green algae