Ecological Importance

Lichens are bio-indicators of healthy air quality. They will not grow where toxic air pollutants are abundant. Lichens, having no vascular system, can absorb these toxins but have no way to release them. Ramalina and Usnea lichens are particularly sensitive to air pollution.

Lichenometry, a method of dating which relates to the growth rate of lichens to the passage of time, is used in analyzing the speed of glacial retreat due to climate change.

Crustose lichens are active participants in soil formation through rock decomposition.

Learn More

What Are Lichens?

Lichens are composite organisms made up of a fungal and an algal partner.

Two fungi, an ascomycete and a basidiomycete, and either a green algae or a type of cyanobacteria, form a special relationship called symbiosis. The fungal components, which are not free-living, give the lichen its form and provide shelter from harmful ultraviolet rays. The green algae or cyanobacteria component provide food in the form of glucose through photosynthesis.

This partnership allows both components to survive under conditions in which they would otherwise perish. There are 14,000 species of lichens worldwide, ranging from coastal bluffs to the highest mountain peaks.

Lichens are the only composite organisms that do not resemble the original partners.

Lichens are extremely diverse in form, color, and size.

Fun Facts

Lichens are traditionally used by native people for their antibiotic properties. Ramalina menziesii, Lace Lichen, was named the official lichen of California in 2015. It is found in every county of the state.

Lichens are used in making litmus paper, and have been used as odor fixatives in perfumes and as natural dyes for wool. Hummingbirds use lichens in their nests.

Additional Facts

Importance

Lichens are used in making litmus paper, and have been used as odor fixatives in perfumes and as natural dyes for wool.

Crustose lichens are active participants in soil formation through rock decomposition.

For More Information

If you have questions about lichens or other plants found in the East Bay, please contact the California Lichen Society (CALS) at californialichens.org, the Regional Parks Botanic Garden at nativeplants.org, or an East Bay Regional Parks Visitor Center:

- Ardenwood Historic Farm, Fremont, (510) 544-2797
- Big Break Visitor Center at the Delta Oakley, (510) 544-3050
- Black Diamond Mines Regional Preserve Antioch, (510) 544-2750
- Coyote Hills Regional Park Fremont, (510) 544-3220
- Crab Cove Visitor Center Alameda, (510) 544-3187
- Del Valle Regional Park Livermore, (510) 544-3146
- Regional Parks Botanic Garden Berkeley, (510) 544-3169
- Sunol Regional Wilderness Sunol, (510) 544-3249
- Tilden Nature Area EEC Berkeley, (510) 544-2233

For More Information

In the Botanic Garden, there are three primary types of lichens—crustose, foliose, and fruticose. Please see reverse for photos and descriptions.

Crustose
Buellia, Button Lichens
Cololoba, Firedot Lichens
Chryzoparmelia, Gold Dust Lichens
Lecanora, Rim Lichens
Rhizocarpon, Map Lichens

Foliose
Flavoparmelia, Greenshield Lichens
Hypogymnia, Pillow Lichens
Lobaria, Lung Lichens
Parmotrema, Ruffle Lichens
Peltigera, Dog Lichens
Turkermanniopsis, Wrinkle Lichens
Umbricaria, Rock Tripe Lichens
Xanthoparmelia, Rock-shield Lichens

Fruticose
Cladonia, Matchstick Lichens
Evernia, Oakmoss Lichens
Letharia, Wolf Lichens
Niebla, Fog Lichens
Ramalina, Lace Lichens
Teloschistes, Orange Bush Lichens
Usnea, Beard Lichens

Although classified in the Fungi Kingdom, lichens are neither fungi nor plants. They are often mistaken for some of the byrophytes that grow in the same habitats, such as mosses, liverworts, and hornworts.

Common Lichens Found in the Regional Parks Botanic Garden

What Are Lichens?
**Crustose**
- Acarospora socialis
  Yellow Cobblestone Lichen
- Aspicilia pacifica
  Pacific Sunken Disk Lichen
- Lecanora muralis
  Stonewall Lichen
- Lecidea tessellata
  Tile Lichen

The simplest form of lichens, crustose attach firmly to rock surfaces to form thin patches that come in a multitude of colors.

**Foliose**
- Parmotrema perlatum
  Black Stone Flower Lichen
- Umbilicaria phaea
  Emery Rock Tripe Lichen
- Xanthoparmelia cumberlandia
  Cumberland Rock-shield Lichen
- Xanthoria parietina
  Common Orange Lichen

Loosely attached to substrates by tough black fibers, foliose lichens grow as flat leaf-like lobes or rosettes and have distinct upper and lower surfaces.

**Fruticose**
- Cladonia furcata
  Many-forked Cup Lichen
- Cladonia macilenta
  Lipstick Powderhorn Lichen
- Ramalina menziesii
  Lace Lichen
- Usnea intermedia
  Western Bushy Beard Lichen

The most advanced lichens, with three-dimensional branches and cup-like structures, fruticose can be pendulant (hanging) or shrub-like (erect).