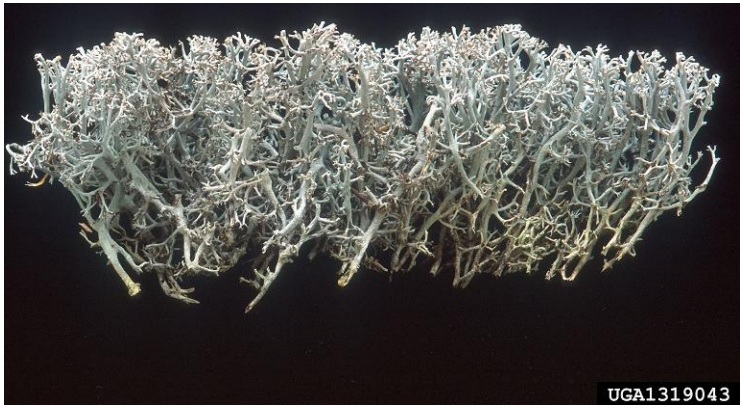
lichens (numerous species)



lichens

numerous species

Lichens are unusual creatures. A lichen is not a single organism the way most other living things are, but rather it is a combination of two organisms which live together intimately. Lichens are organisms consisting of both fungi and algae, and will grow almost anywhere that a stable and reasonably well-lit surface occurs. This may include soil, rock, or even the sides of trees. A lichen may absorb certain mineral nutrients from any of these substrates on which it grows, but is generally self-reliant in feeding itself through photosynthesis in the algal cells. Thus, lichens growing on trees are not parasites on the trees and do not feed on them, any more than you feed on the chair you sit in. Lichens growing in trees are simply using the tree as a home. Lichens growing on rocks, though, may release chemicals, which speed the degradation of the rock into soil, and thus promote production of new soils.

The most serious threat to the continued health of lichens is not predation, but the increased pollution of this century. Because some lichens are so sensitive, they are now being used to quickly and cheaply monitor air quality and forest health by assessing levels of air toxins. Lichens are very responsive to environmental stressors in forests, including changes in forest structure, air quality, and climate. The composition of an epiphytic lichen community is one of the best biological indicators of air pollution in forests, because epiphytic (a plant that derives its moisture and nutrients from the air and rain and usually grows on another plant) lichens rely totally on atmospheric sources of nutrition.

Although trees may respond to moderate, chronic levels of air pollution deposition, all of the other influences on tree growth, such as variation in soils, make the responses of trees to pollutants difficult to measure in the field. Epiphytic lichens may be used to assess potential air quality impacts on forest ecosystem health and productivity that are difficult to measure directly. Long-term observation of lichen community change provides early indication of improving or deteriorating air quality.