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F ILOLI

GARDENER'S REFERENCE

Many of Filoli's established trees and shrubs are decorated in the pale green crusts, nets, and woolly sleeves of our native lichens. They can be easy to miss, hidden by lush summer foliage, but on a damp day in early spring they are a vibrant addition to dormant branches. Concerned visitors often ask how gardeners control lichens, and if they stunt the plants' growth or harm their flower buds in any way. The short answer is no. Lichens are very slow growing and are not parasites; branches are simply ideal surfaces for lichens to flourish.

LICHENS

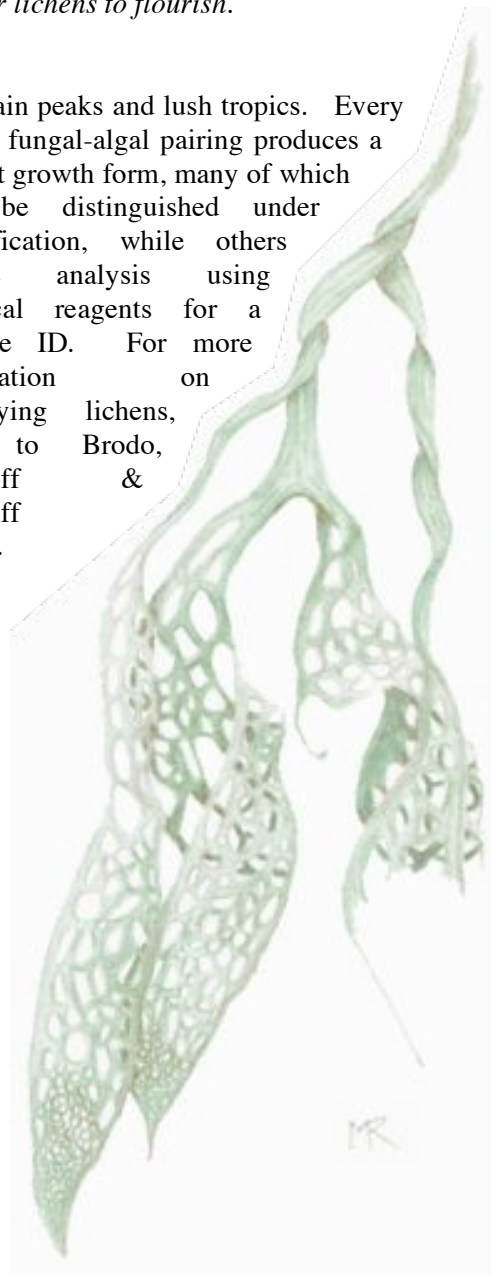
What is lichen?

Lichens are neither plant nor animal. In fact, they don't belong to any one organismal kingdom because they are actually a symbiotic pairing of two—or occasionally three—organisms in one, representing three separate kingdoms: a fungus (kingdom *Fungi*), and an alga (kingdom *Monera*), or a cyanobacteria (kingdom *Protocista*). As a part of lichen, the alga or cyanobacteria is called a *photobiont*. In many cases, the fungus or the photobiont may grow independently, but when found together, they make a trade of services: the fungus provides shelter from intense UV radiation, and absorbs water and dissolved minerals. The photobiont provides carbohydrates through photosynthesis. Contrary to common misconception, lichens are not parasitic; they do not co-opt any of a plant's nutrients or otherwise harm their host. Lichens are epiphytic, meaning that they may use branches as surfaces on which to cling or hang. They may also be found on non-living surfaces, such as fence posts, buildings, and rocks.

What does lichen look like?

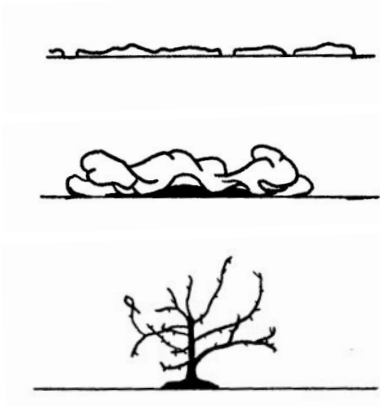
Over 14,000 species of lichen have been identified worldwide, and their diverse forms can be found from the frozen poles to sandy deserts, rocky

mountain peaks and lush tropics. Every unique fungal-algal pairing produces a distinct growth form, many of which may be distinguished under magnification, while others require analysis using chemical reagents for a positive ID. For more information on identifying lichens, refer to Brodo, Sharnoff & Sharnoff (2001).



Ramalina menziesii.
Illustration: M. Richards

Lichen growth forms can be divided into four categories: Crustose, Foliose, Squamulose (not pictured), and Fruticose.



Why leave the lichens?

Filoli's gardens were originally intended to complement the beauty of the natural surroundings, so it is fitting that those surroundings should influence the character of the garden today and serve as a reminder of Filoli's overarching vision of preservation. Worldwide, lichens are an important resource for many animals, as forage and as nesting materials. They are also an important resource for humans: in some cultures they are a food source; they are widely used as dyes and as fixatives in perfumes; and their unique chemical attributes make them an important resource for pharmaceutical research. Lichens are also reliable indicators of air quality; the National Park Service regularly uses lichen populations to monitor pollution levels in parks and forests nationwide. Many of the lichens growing at Filoli today could once be found along the length of the California coast, but many of them are no longer found south of Santa Barbara county because of their sensitivity to declining air quality. Filoli is fortunate to be a host of diverse and robust lichen populations, and we hope that visitors enjoy the presence and delicate beauty of these flavors of our natural heritage.

Lichens at Filoli

Some of the lichens commonly found at Filoli include:

- Oak Moss (*Evernia prunastri*): Shrubby, grey-green lichen with antler-like branches. Similar in appearance to *Ramalina farinacea*, also found on the property.
- Lace lichen (*Ramalina menziesii*): Light yellow-green, net-like (Fruticose) lichen commonly found on branches. Often confused with Spanish moss, a bromeliad (*Tillandsia usneoides*).
- Lettuce lichen (*Flavoparmelia caperata*): Light green, Foliose lichen with a wrinkled surface, commonly found on fence posts.
- Pincushion Sunburst Lichen / Lumpy lichen (*Xanthoria polycarpa*) Small clumps of bright orange, foliose lichen found on fence posts and branches.



New leaves of Magnolia stellata push through a fuzz of lichens.

References and Further Reading:

Rush, E. (Jan-Mar 2002). Lichens: The Invisible Partnership. *Bay Nature*. Retrieved 11 May 2007 from: http://www.baynature.com/2002janmarch/lichens_2002janmarch.html

Filoli Nature Education Trail Guide.

Brodo, I.M., Sharnoff, S.D., and Sharnoff, S. (2001). *Lichens of North America*. New Haven: Yale University Press.

Filoli Gardener's Reference sheets are created by garden staff to answer common questions regarding Filoli's traditional horticultural practices. This sheet may be accessed from the Filoli website.

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