CDLOER Flora: Moss, Lichen and Fungi

Upon entering the Canada De Los Osos Ecological Reserve the first thing a visitor notices is the abundance of mosses and lichen that grow on nearly every natural surface. This is possible because there is little pollution that reaches these hills, and because there is usually a lot of early morning fog that provides much needed moisture. Lichen grows best in these conditions and is a great bio indicator of overall air and water quality of the habitat.

Lichen exists as a remarkable symbiotic relationship between fungi and a photosynthetic organism where nutrition is provided for the fungi and the fungi in turn acts as protection against drying out. This complex interaction between two organisms has allowed the entire life form to diversify into a wide range of habitats that may be otherwise unsuitable for most plants. Lichen exists in foliose (lobed, leaflike shape), fruticose (upright or pendulous branches), and crustose (resembles a crust) forms, examples of which can be seen in the photo above right.

The lichen species that contain photosynthetic bacteria (blue-green algae) serve to convert nitrogen from the atmosphere into a form that it can be used by the entire ecosystem. Crustose lichen is important in breaking rocks down in to soil. Most lichens are ascomycetes (common mushrooms like morels and yeasts) that reproduce both sexually and asexually by producing spores, and by propagation from the parent plant.

The apothecia (reproductive structures) are clearly visible on the foliose lichen in the picture to the left (*Parmelina spp*).

There are many different microhabitats within the Reserve. The areas that have the highest lichen diversity are the shaded oak woodland habitats, the riparian habitats and the mixed chaparral habitats. Lichen and moss alike thrive in each of these areas, despite their varied sun exposures, moisture availability, and elevations.

In the Oak Woodland areas, the tree branches are densely populated with many foliose and fruticose lichens, as shown in the picture to the right. In many areas of the Reserve, pendant Lace Lichen (*Ramalina menziesii*) hangs from the branches of the trees in sheets that sway in the breeze. During the fall and winter months the Blacktail Deer that inhabit the Reserve rely on this abundance of lichen to provide nourishment when other plants are not available. Some lichens contain useful compounds that have been used in medicines and to dye fabrics.

Riparian areas throughout the Reserve tend to have a much larger population of mosses and fungi in addition to the many different lichen species. Moss lack vascular tissue to move water and nutrients, which means that it only grows to 1-2 inches in height and must be near a somewhat constant source of water to keep from drying out. The picture at the left shows a spongy bed of moss growing on a rotting log found along a stream, with a strand of Lace Lichen that does well in the wetter riparian areas.

The vast array of fungi that can be seen at the Reserve is a gift that should be relished. Some unique fungi, such as the Bear's Head Tooth fungi (*Hericium corallina*) seen in the picture to the right is rarely seen this far West. Fungi function to decompose organic matter, such as wood, feces and fallen leaves. Many interesting fungi can found in the California Bay grove just past the Education Center, like the bracket fungi (*Ganoderma applanatum*) seen in the picture at the left on the following page. These Bay trees wear a thick covering of moss on the North and North-West facing sides of their trunks because they are

not harmed by the sun's rays in that location. Many photosynthetic lichen species make their home in the narrow spaces left by the mosses. All of these organisms growing together in an area increases its diversity of both animal and plant life.

The Chemise and *Ceanothus* species that populate the mixed chaparral areas are nearly completely covered in lichen. These habitats are south-facing and dry, but they still harbor a great number of lichen specimens. Some lichen requires an old chaparral plant (50-60 years old) to be able to colonize on its branches. Chemise in particular produces a resin that makes it difficult for other plants to grow within its immediate vicinity. As times passes, the older branches lose some of this resinous covering and the lichen are able to take hold.

There is a delicate balance of habitat types that helps maintain the biodiversity of the Reserve. One of the more abundant habitat types at the Reserve is the Grasslands, where both native and non-native grasses and flowers fight for what little nutrients and moisture there is in the soil. Lichen inhabits these areas as well, but mostly in its crustose form on the occasional wooden fence post and rocky outcrops, as seen in the picture to the right. It seems that regardless of where one ventures to on the Reserve, there will be an impressive array of Flora to fill the senses.

References

All pictures courtesy of Gladys Corkill, CDLOER Spring 2016 Intern.

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