Common Lichens of the Estero Bay Area

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Funded by a grant from the Morro Bay National Estuary

Introduction

About This Guide

This guide is not intended to be a comprehensive guide to lichen identification. Rather, this is an introduction to the taxa and common genera encountered in the Estero Bay area. As lichens are a combination of an algae and a fungus, taxonomy can be very difficult. Knowledge of the fungal and algal component is necessary in the identification of lichens, and often involves the use of compound microscopes, chemical tests (thin layer chromatography, TLC), and morphology. While hundreds of lichen species occur in our area, including numerous undescribed species, the most readily identifiable genera have been included here.

If a particular species is afforded special conservation status, this status has been included. Habitat, common substrates, and host plants have been discussed in an attempt to relate lichen species to the local context in which they occur. It is the intent of this guide to be a visual aid so that anyone could pick it up, walk around the empty lots, sand dunes, coastal bluffs, canyons, and woodlands in our area and begin to recognize the genera and species that are commonly seen.

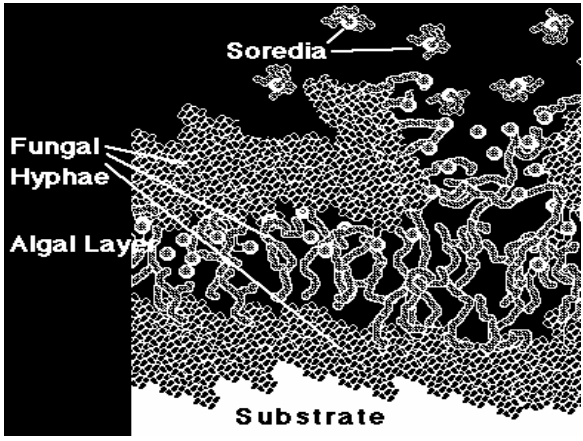
Location information is provided wherever the species has been documented in a given state park unit. Locations appear in parenthesis at the end of the "notes" section in the species accounts and are abbreviated as follows: EB=Estero Bluffs State Property, HC=Harmony Coast State Property, MBSP=Morro bay State park, MSSB=Morro Strand state Beach, MDO=Montana de Oro State Park, and LOOR-Los Osos Oaks Reserve.

A visual guide to basic terminology included in this guide is located at the end of this introduction. For a list of references, recommended texts, and contributing entities, please see the last page. This guide was funded the Morro Bay National Estuary Program education and outreach grant division. Special thanks to Kerry Knudsen, Dr. David J. Keil, CDPR San Luis Obispo Coast District, and Shirley Tucker.

Map of area covered in this guide.

Lichens, a symbiotic relationship between a fungus and algae, are known to be one of the slowest growing organisms. Lichens are found locally on vegetation, rocks, soil, and structures from the high tide line to wind swept rocky peaks. In general, the chlorophyll in the algae photosynthesizes and produces the food energy required for living, while the fungus is responsible for attachment to the host as well as holding moisture and providing protection from the environment.

Lichens are often considered to be indicators of ecological health, disturbance, and air quality because they are easily disturbed and can be quickly exterminated. Most of them require host species and some are very host specific. There are three main types of lichens: foliolose (leaf like), fruticose (pendulous or shrubby), and crustose (crust like).



bionet.informatik.uni-oldenburg.de

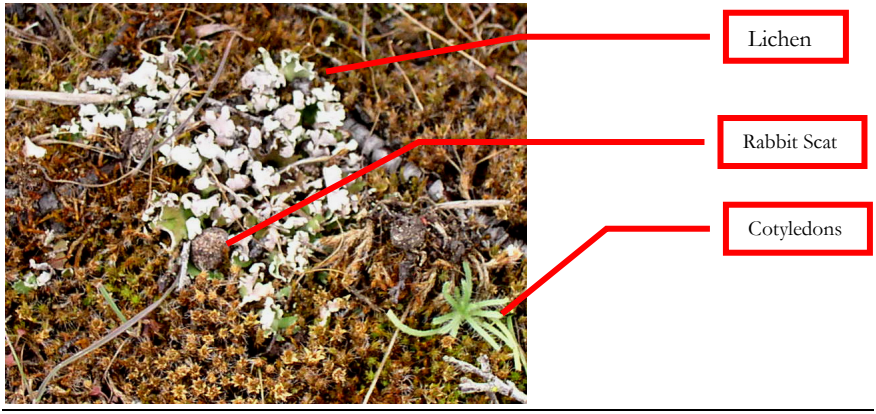
A cross section of a lichen thallus showing the arrangement of the fungus and algae

There are a few general habitat requirements that apply to all lichens. These requirements are: water, available substrate, and for most, sunlight. Tolerance ranges and substrate or host requirements differ for each lichen species. Some lichens are very specific. Examples of specificity include a lichen species growing exclusively in the senescent canopy of a particular plant host,

only near bird nests in the riparian areas, or along exposed coastal sandstone just above the splash zone. Other lichens are generalists, growing on a variety of substrates in a variety of habitats. Also, lichen associations often form lichen seral and climax communities much in the same way that plant associations form plant communities. These communities are not well studied, and, as such, are not commonly described. Generally, lichens are described according to the plant communities that they are found in.

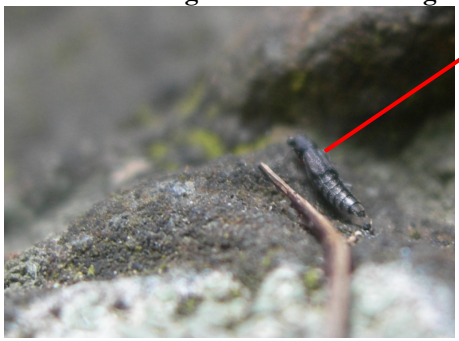
Most lichens spread by vegetative fragmentation. In some cases the fragmentation occurs when the acids in the lichens eventually breakdown the rock, the rock breaks off and tumbles downslope, and a new colony forms wherever the falling debris settle. Other means of fragmentation occur when bird or small mammal harvests lichens for nesting material. Locally, hummingbirds and bushtits often use lichens in building their intricately woven nests. Other dispersal mechanisms involve the production of spores. Some species of lichens produce soredia, small clusters of algal cells surrounded by fungal threads, which arise from below the surface of the thallus. Other lichen species produce isidia which arise from the surface of the thallus as outgrowths and function in the same manner as soredia. Other lichens reproduce sexually forming spores, which, when germinated, must find the proper algal component in order to form the lichen species.

Lichens play an important ecological role. They contain acids which can break down rock. This process is called primary succession. They can also form "seed beds" for mosses, ferns and fern allies, and angiosperms, by decomposing the bedrock and catching leaf litter form other species. Many lichens contain cyanobacteria as the photobiont (photosynthesizing component), which can play an important role in nitrogen fixation. Lichens also provide nesting/burrow materials for many bird species and small mammals, forage for herbivores, and in some cases, stabilize soils.



Lichen and mosses forming seed beds.

Birds nests using lichens as a building material. www.learner.org



Invertebrates such as these (a beetle larvae and a lichen mite), play important roles in lichen ecology. They may aid in dispersal of isidia, soredia, or spores. Dispersal occurs while foraging on the lichens or making their homes between the undersurface of the lichen thallus and the substrate, where the lichen acids and rhizines have lifted the surface of the bark or rock.

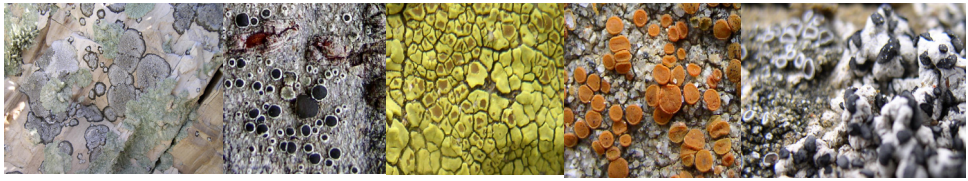
Lichens are a diverse and fascinating group of organisms that are surprisingly understudied. Given their abundance, their ability to indicate disturbance, and their easily accessible nature, the lack of lichen studies is alarming. Locally, we have hundreds of lichen species, including numerous undescribed species. We also have four rare lichens listed as "1B' by the California Native Plant Society, and one species that is a candidate for listing under the US Endangered Species Act. In addition, we have rare lichen associations that are not afforded any formal recognition. For example, on Morro Rock we have a lichen assemblage that has been extirpated from areas of human use and now is found only on isolated islands. In Los Osos, Baywood fine sands support a community where soils are bound together by a dense growth of ground dwelling lichens and mosses that form a biological, or cryptogametic, soil crust. This type of community is highly susceptible to disturbance by invading exotic plant species, foot traffic, and erosion. Encrusting lichens are the most tolerant to disturbance. Recolonization after

disturbances such as fire, foot traffic, development, etc. depends on suitable habitat re-establishment and proximity to available "source" populations.

Types of Lichens

The following are examples of the three basic types of lichen groups: crustose, foliolose, fruticose. Specialized morphological features necessary to understanding these grouping are included and photographic examples are provided.

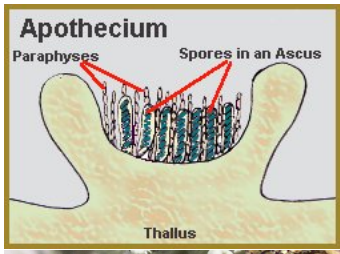
Crustose - Thallus forms a crust over substrate



Foliolose - Thallus is leaf-like in habit and physiogamy

Fruticose - Thallus is bunching, tuft forming, or shrub-like

Apothecia - Ascocarp, a spore producing fungal structure, usually cup-shaped.

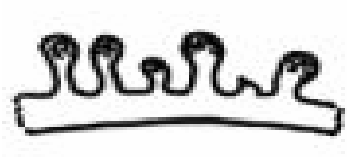


www.earthlife.net

Cilia - Hair or thread like projections on the thallus

Fibrils - Round, thick appendages that project from the thallus

Isidia - Asexual reproductive structures. Outgrowths on the surface; contain the photobiont. Has a cortex.



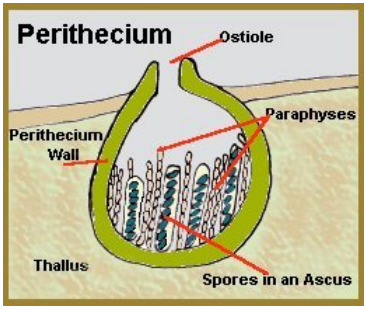
internt.nhm.ac.uk

Lobules - lobes which grow on the edges of the thallus (on foliolose lichens). They are flat and break off from the thallus and are distributed by wind, water, and transport by animals.

mgd.nacse.org

Mycobiont - Fungal component of the lichen.

Perithecia - Embedded, flask-shaped ascocarp. Top lip protrudes above thallus. Contains fungal spores.

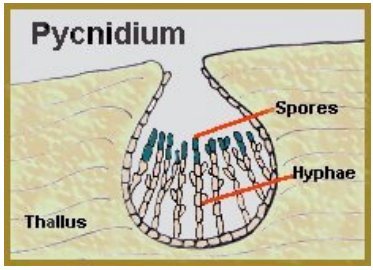


www.earthlife.net

Photobiont - Algal component responsible for photosynthesis. May be a true algae, a cyanobacteria, or both.

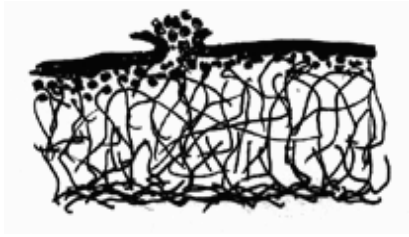
Podetia - Secondary upright thallus, often seen in *Cladonia* spp. Typically hollow and disk-like or lobed.

Pycnidia - Asexual structures of fungus. Usually embedded (sometimes with a slightly mounded projection) in the thallus, flask-shaped, and appears as a black dot. Below thallus surface. Contain conidiospores - spores produced from the end or side of special hyphal filaments called conidia.



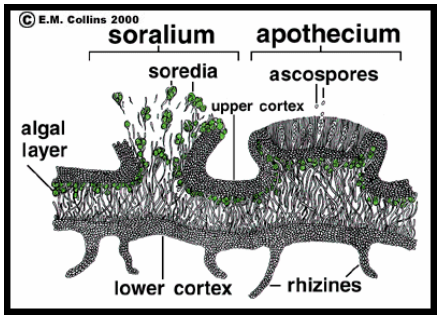
www.earthlife.net

Soredia/Soralia - Asexual reproductive structures containing algal cells wrapped in fungal hyphae that burst through the surface of the thallus. Granular. No cortex.



bugs.bio.usyd.edu.au

Thallus - The "vegetative " portion; forms the body of the lichen and is the primary photosynthetic surface. The surface of the thallus is called the cortex. From the upper surface, reproductive structures emerge, while rhizines are formed on the lower surface



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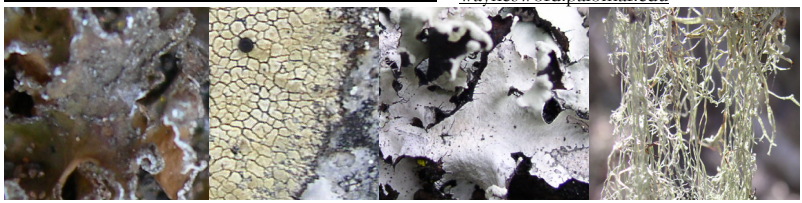


Unique Local Lichen Communities

There are quite a few local lichen associations that deserve discussion. Below are examples of these associations, or lichen communities, that are important in our area. These communities are not afforded any formal recognition, as most people relate lichens to plant communities. However, lichenologists today are working diligently on classifying formal lichen community names and descriptions.

Exposed/Windswept Coastal/Island Rock

Undisturbed areas with exposed and windswept rock along the immediate coast or on islands. Lichens are generally tough; the majority of them are typically crustose. Wind, fog, moisture, salt, and sand spray are constant environment factors that affect lichen species in this community. Acids in the lichens decompose the rocky substrate, often separating the top layer of rock which appears glued to the bottom of the lichens. The windswept coastal rocks have a unique composition of lichen species. Many are only found here, along the central coast, and on the Channel Islands.

Woody branches in Coastal scrub/Chaparral

The woody branches of coastal scrub and chaparral make a great substrate for lichen species. Lichens will tend to colonize the inner branches of healthy-looking shrubs. As the shrubs begin to die, or senesce, they loose their leaves and their branches begin to open up to sunlight, eventually falling over to the ground. With the decrease of the shrub canopy, there is an increase in available light for the lichens, and both lichen abundance and diversity dramatically rises. *Adenostoma fasciculatum* (chamise) and *Ceanothus cuneatus* (buck brush) seem to be the best shrubby hosts in the local scrub and chaparral plant communities.

Baywood Fine Sands Soil Crust

Cladonia **spp. and mosses form biological crusts (cryptogametic soils) on Baywood fine sands**

Carpeting the ground in the open areas in coastal scrub and chaparral communities on Bayood fine sands. Other habitat requirements seem to include open, sandy soil, leaf litter, small mammal scat, and little to no disturbance to the surface of the ground. The lichen species, especially *Cladonia* spp., form dense mats with mosses. These mats act as seed beds for higher plant species, help to fix nitrogen into the soil, and also aid in soil stabilization. This lichen-moss association is highly susceptible to disturbance, especially from foot traffic and exotic plant invasion.

Rocky Outcrops

Rocky outcrops may occur in grasslands, coastal scrub and chaparral, and canyons. These outcrops are not along the immediate coast, but may still be influenced by the ocean environment. These areas are typically dominated by crustose lichens. The lichens on these outcrops play an important role in forming suitable seed beds to support plant life. Vascular plants commonly found on rocky outcrops include dudleya, fern, and grass species.

Bark Lichens in Woodlands



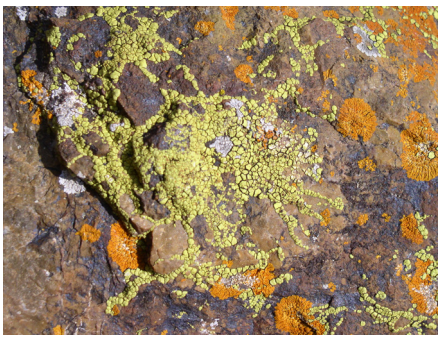
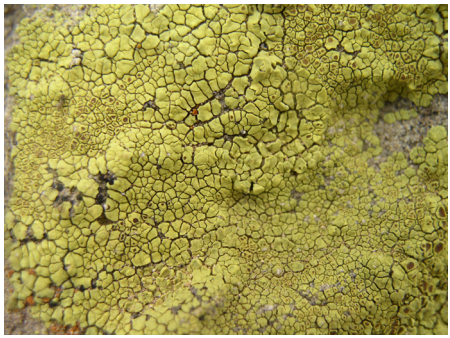
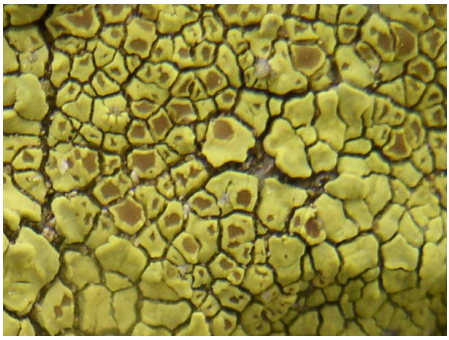
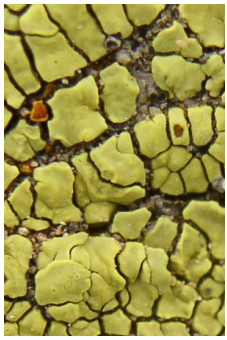


Woodland lichen associations are influenced by the density of the stand, canopy cover, available light, moisture, and sometimes the dominate host substrate. Species may vary greatly between woodland types such as willow riparian, oak woodland, and manzanita woodlands. Bark species along the trunk are dominated by crustose lichens, and branch or canopy species composition includes a fair variety of foliolose species.

Dead Wood

Fence posts, old wood structures, fallen branches, and driftwood all provide suitable lichen habitat. Locally, many encrusting species of lichens colonize dead wood, and foliolose and fruticose lichens establish later.

The Lichens

Acarospora chlorophana **or** ***solstilis***

COBBLESTONE LICHEN

Habitat: On rocks near the coast.

Notes: Crustose. Locally, this genera can be seen in abundance on rocky outcrops on coastal bluffs. Note the red, irregularly shaped, immersed apothecia. Also, note the veins of *Acarospora* growth in the upper left photo. This genus often speads in a liner fashion, taking advantage of crevices in the rock. (EB, HC, MBSP, MDO)

Arthonia Comma Lichens


***Arthonia* sp.**

COMMA LICHENS

Habitat: On wood in shaded areas.

Notes: Small burnt orange-colored apothecia. (MBSP, MDO, EB)

Bryoria Hair Lichens



Bryoria pseudo-cappillaris

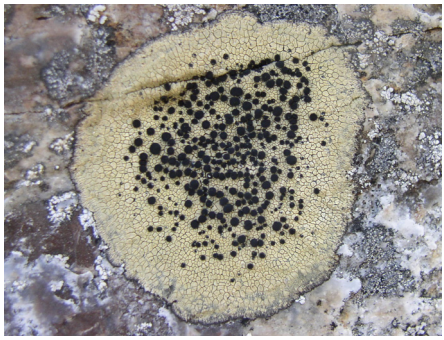
OLD MAN'S BEARD

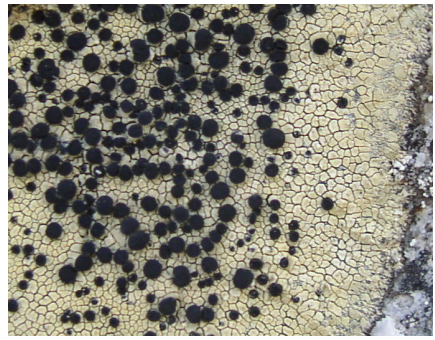
Habitat: On woody branches in chaparral and coastal scrub.

Notes: Fruticose. Forms soft and wavy looking clumps, made up of the light brown-grey colored thallus. The species designation on this *Bryoria* is under debate. The consensus classifies this as *B. pseudo-cappillaris*. Most commonly found growing on *Adenostoma faciculatum* and *Ceanothus cuneatus*. This species was found, in abundance, growing on *Adenostoma fasciculatum* (chamise) throughout the Morro manzanita dominated maritime chaparral community in LOOR in 2005. Commonly associated lichen species include, but are not limited to: *Usnea rubicunda, Heterodermia leucomelaena, Hypogymnia imshugii, Parmotrema chinensis,* and *Ramalina* spp. (LOOR, MBSP, MDO)

The sensitive (CNPS 1B) *Bryoria spiralifera* (Spiraled old-man's beard) was reported to be in the in a local Master's thesis (Von Reis) but has not been found since. *Bryoria spiralifera* has a ridge spiraling around the thallus, grows on trees and shrubs in coastal areas near sea level, and seems to require steady fog. No sexual features have ever been documented.

Buellia **Button Lichens**





Buellia halonia

SEASIDE BUTTON LICHEN

Habitat: On rock

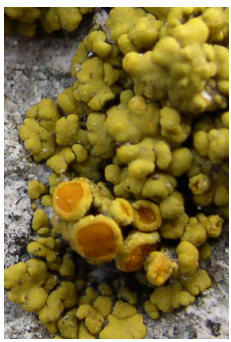
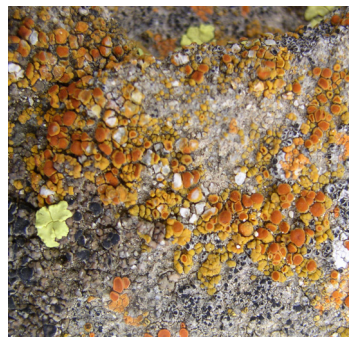
Notes: Crustose. Located on rocky outcrops in the bluffs, grasslands, and up some canyons. Has raised, rounded apothecia and a dusky yellow-green-grey segmented thallus. (MDO, EB, MBSP)


Calaplaca coralloides

CORAL FIREDOT LICHEN

Habitat: On rock in coastal areas. Found on intertidal rocks in the splash zone.

Notes: Fruticose. Tufted. Often forms large colonies. Thallus branches appear segmented. Orange to yellow-orange in color. Especially favors sandstone. (MBSP, EB, MDO).


Calaplaca bolcinia

WAXY FIREDOT LICHEN

Habitat: Rocky outcrops along coast and coastal bluffs.

Notes: Crustose. Especially favors sandstone. Thick lobed thallus is reduced. Dark orange apothecia. Rim and thallus are light orange. (MSSB, EB. HC)

Calaplaca sp.

FIREDOT LICHEN

Habitat: Rocky outcrops and coastal bluffs

Notes: Crustose. Especially favors sandstone. Sessile orange apothecia. *Calaplaca leutominia* looks the same but is red and has a thicker rim around the apothecia. The black dots visible on the apothecia (lower right photo) are called lichen ecoles. They are a type of fungus that parasitizes lichens. Notice the gray/black colored apothecia in the center of the left photo. These apothecia have been colonized by the ecoles and are dying. (MDO, EB, HC, MSSB, MBSP). This species is either *C. nashii or C. crenulata.*

Candelaria Candelflame Lichens

Candelaria sp.

CANDLEFLAME LICHEN

Habitat: On woody branches in coastal scrub, chaparral, oak woodlands.

Notes: Crustose. This is a very fine crust with bright yellow "coating." Seen here on *Adenostoma faciculatum* and *Ceanothus cuneatus* with *Physica* sp. (MDO, LOOR, MBSP). Either *C. concolor* or *C. pacifica.*

Cladonia Powderhorn, Pixie-cup, Cladonia Lichens

Caldonia cervicornis verticillata

LADDER LICHEN

Habitat: Grows on the ground, typically on open sandy soils, or as an understory beneath shrubs and forbs.

Notes: Fruticose. Notice how the podetia (disks) appear to be stacked and arising from one another. (MBSP, MDO)


Cladonia macilenta

LIPSTICK POWDERHORN OR PIN CLADONIA

Habitat: On old branches in maritime chaparral.

Notes: Seen here, growing on dead wood branches of *Arctostaphylos morroensis* near the ground. (MDO)


***Cladonia* sp.**

MEALY PIXIE-CUP/PIXIE-CUP LICHEN

Habitat: On the ground and sometimes on stems in coastal scrub, chaparral and open areas near coastal scrub/grassland ecotones.

Notes: Green. Highly lobed thallus. Podetia strongly goblet-like. Often clump-forming. A common ground lichen. This is *C. chlorophea* or *C. asahinae.* (MBSP, MDO, HC)

Cladonia fimbriata

CLADONIA

Habitat: On the ground in coastal scrub, chaparral and open areas near coastal scrub/grassland ecotones. (MBSP, MDO)

***Cladonia* sp.**

CLADONIA

Habitat: On old wood, woody branches, and on the ground.

Notes: This prostrate growing foliolose lichen is found in the maritime chaparral community growing in distinct patches on undisturbed soils in the open and beneath plants such as *Ericameria ericoides, Adenostoma fasciculatum, Arctostaphylos morroensis,* and *Ceanothus cuneatus.* (MBSP, LOOR, MDO)

Chrysothrix Gold Dust Lichens


Chrysothrix candelaris

GOLD DUST LICHEN

Habitat: On rocks, seldom on wood.

Notes: Crust forming. Bright yellow. No thallus. All soredia. (MDO, MBSP, HC, EB, LOOR)

Dendrographa False Orchil Lichens



Dendographa leucophaea

FALSE ORCHIL

Habitat: On undisturbed rocky outcrops along the immediate coast, just offshore, and on coastal islands.

Notes: Fruticose. This dense clump has soft whitish thallus. Main branches are flattened. Infertile form (seen here) is softer, lighter, and main branches are more brittle. (MDO, MBSP, EB)

Dermatocarpon Stippleback or Leather Lichens

Dermatocarpon americanum

COMMON STIPPLEBACK OR LEATHER LICHEN

Habitat: Islands and rocks along the immediate coast.

Notes: Single thalli, often with slightly lobed margins. Flattened upper surface is dull grayish. Brittle, foliolose, and prostrate. Sometimes found in clusters. Also known as "rock lettuce," this species is most commonly found on sandstone. Black dots are perithecia. (MBSP, EB)


Evernia prunastri

OAKMOSS LICHEN

Habitat: On wood and woody branches in maritime chaparral, coastal scrub, and oak woodlands

Notes: Fruticose. Light greenish with a lobed and branched thallus. Sometimes confused with *Ramalina leptocarpa*, *Evernia prunastri* has a small more delicate tuft. Seen here on *Adenostoma fasciculatum*. (LOOR, MBSP)

Flavoparmelia Greenshield Lichens


Flavoparmelia caperata

COMMON GREENSHEILD LICHEN

Habitat: On woody stems in chaparral and coastal scrub

Notes: Thallus flattened, prostrate,and light green-yellow. Often wrinkled. Apothecia reddish brown. Fairly common, this species prefers old woody branches. Seen here on *Ceanothus cuneatus* (MBSP, LOOR, MDO)

Heterodermia Fringe or Centipede Lichens


Heterodermia leucomela

ELEGANT FRINGE or ELEGANT CENTIPEDE LICHEN

Habitat: On wood in maritime chaparral and coastal scrub.

Notes: Fruticose and clump forming. Long white thallus with black marginal cilia. (LOOR, MBSP, MDO)

Heterodermia namaquana

COASTAL FRINGE LICHEN

Habitat: On wood in maritime chaparral and coastal scrub.

Notes: Fruticose. Short and shrubby, with a white thallus and an undersurface that is fuzzy and soft, almost web-like. Marginal cilia are white turning black. Seen here on *A. fasciculatum* and *C. cuneatus.* (LOOR, MBSP)



Hubbsia parishii

BRITTLE BAG LICHEN

Habitat: On undisturbed rock along immediate coast, just offshore, and on coastal islands.

Notes*:* Fruticose. Clump forming, almost "brain-like." Has a white thallus and the lobes are inflated. Soredia present, commonly at tips of thallus. This species is restricted to undisturbed, exposed rocky area along the coast. (MBSP, EB


Hypogamnia gracilis

FORKED TUBE LICHEN

Habitat: On the bark of shrubs and trees in coastal scrub, coast live oak woodland, and maritime chaparral

Notes: Foliolose. Thallus is whitish, dark underneath. Thallus lobes are elongated and sometimes tube-like. Apothecia reddish, large, and flared when mature. Seen here on *Ceanothus cuneatus.* (MBSP)


Hypogamnia mollis

LOS OSOS BLACK AND WHITE TUBE LICHEN

Status: CNPS 1B

Habitat: On the bark and twigs of shrubs and trees in coastal scrub, coast live oak woodland, and maritime chaparral

Notes: Foliolose. Thallus is thick, whitish on top, and dark underneath. The thallus is shorter and stouter than other *Hypogamnia* species; lobes are sometimes tube-like. Lacks apothecia and has surface soralia. Tends to occur in small patches. Common host species include: *Artemisia californica* (coastal sagebrush), *Arctostaphylos morroensis* (Morro manzanita), and *Ceanothus cuneatus* (buckbrush). (MBSP, LOOR)

Kaerenfeltia **Thornbush Lichens**

***Kaerenfeltia* sp.**

COASTAL THORNBUSH LICHEN

Habitat: Woody branches at undisturbed sites in coastal scrub and chaparral.

Notes: Fruticose. Shrubby, with a dark brown-green branching thallus. Black, terminal apothecia. Seen here on *Ceanothus cuneatus.* When wet, specimens appear to be much more green and fleshy, like seaweed. This specimen is either *K. californica* or *K. merrilli* (LOOR, MBSP)

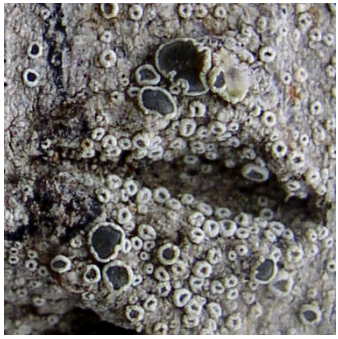
Lecanora caesiorubella

FROSTED RIM-LICHEN

Habitat: Tree trunks.

Notes: Seen here on *Salix lasiolepis* in a wooded canyon. (MDO, MBSP, LOOR)

Other *Lecanora* species



Habitat: On bark, in wooded areas. (HC, MDO)


Habitat: On coastal sandstone. (EB)

Habitat: On rock. (MBSP, EB)


Habitat: On soil. (MBSP, MDO, LOOR, EB, HC)

Melanelia fuliginosa

SHINY CAMOUFLAGE LICHEN

Habitat: On wood in coastal scrub and chaparral.

Notes: Foliolose. Thallus is green to brown and appears to be wrinkled. Grows prostrate against woody branches, especially old or dead wood that is close to the ground. Not observed in colonies. (MDO, MBSP, LOOR)

Micarea nitschkeana

DOT LICHEN

Habitat: Thick encrusting lichen. White thallus and black bulb or dot-like apothecia. On sandstone along the immeadiate coast. (EB)





Niebla cephalota – on rock

POWDERY FOG LICHEN

Habitat: On rocks along the immediate coast and on coastal islands, or on woody branches in oak woodlands and riparian areas near the coast

Notes: Shrubby and small, this is the most distinct of the *Niebla* species. The light green-grey thallus is more or less cylindric. Tipped with darker grey "fuzzy balls" which are actually clusters of soridea. Most commonly on wood. Found growing on *Salix lasiolepis* and on rock. (MDO, MBSP, LOOR, EB, HC)

Niebla combeiodes

BOQUET FOG LICHEN

Habitat: On rocks along the immediate coast and on coastal islands.

Notes: Found at EB on rock.

Niebla homelea

NIEBLA

Habitat: On rocks along the immediate coast and on coastal islands. (MBSP, MDO, EB)

Niebla laevigata

BLACK-FOOTED FOG LICHEN

Habitat: On rocks along the immediate coast and on coastal islands.

Notes: Found on rock at EB.

Niebla tubercula

ARMORED FOG LICHEN

Habitat: On rocks along the immediate coast and on coastal islands. (MBSP, MDO, EB)





***Niebla* sp.**

NIEBLA

Habitat: On rocks along the immediate coast and on coastal islands. Occasionally on rock in coastal canyons (MDO, MBSP, EB)

Opeographa sp.

SRRIBBLE LICHEN

Habitat: On coastal rocks.

Notes: Crustose. Whitish with blue-grey, sunken and elongated apothecia, shaped like skinny kidney beans. Uncommon in our area. (MSSB, MDO, LOOR, MBSP, EB, HC)

Ophisioma Bloodspot Lichens

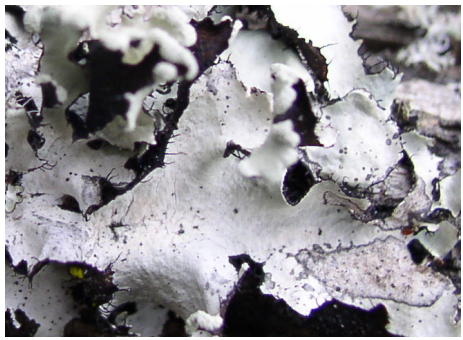

***Ophisioma* sp.**

BLOODSPOT LICHEN

Habitat: On beached wood in stabilized dune-estuary ecotone.

Notes: Thallus is white and textured, similar to bitter lobed lichens. Apothecia red-pink-orange with lobed margins. (EB)

Parmotremma Ruffle or Scatter-rug Lichens

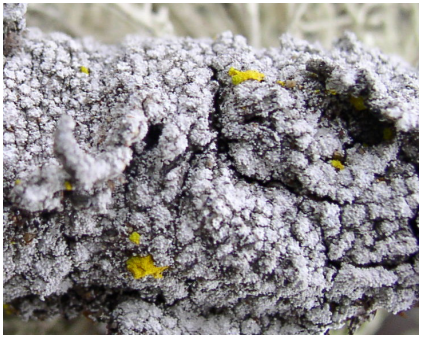
Parmotremma chinensis

POWERED RUFFLE LICHEN

Habitat: Woody branches in coastal scrub, chaparral.

Notes: Foliolose. Seen here on *A. fasciculatum*. Differentiated from the sensitive *P. hypolucinum* by the light margins underside. (MDO, LOOR, MBSP, MSSB, EB, HC)

Pertusaria Wart Lichens

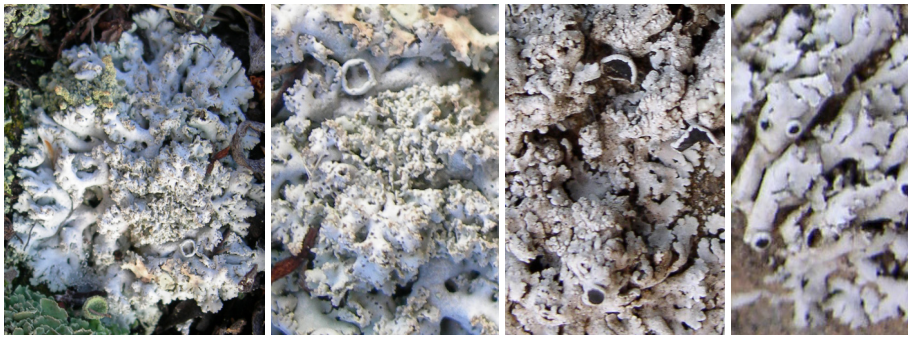


Pertusaria amara

BITTER WART LICHEN

Habitat: On woody branches in coastal scrub and chaparral. Often near the ground and on dead wood.

Notes: Thallus is grey and dotted white and has fruiting warts and white soredia. Has a bitter taste. Seen here on *C. cuneatus.* (LOOR, MBSP)



Physica tribeccia

Habitat: Often on woody branches, especially near the base of shrubs, sometimes on the ground. In Coastal scrub and chaparral communities.

Notes: Foliolose. Thallus whitish and margins are delicately lobed. Apothecia dark with white rim. Forms small prostrate clusters. (MBSP, MDO, HC, EB)

Ramalina menzesei

LACE LICHEN, FISH NET LICHEN, OLD MAN'S BEARD

Habitat: On tree branches in oak woodland and riparian areas.

Notes: Thallus is light sage-green and net-like. Forms large clusters and colonies. Most commonly found on *Quercus agrifolia* and *Salix lasieolepis*. Often long and whispy. Commonly observed in bird's nests. (MDO, LOOR, MBSP, MSSB, EB, HC)



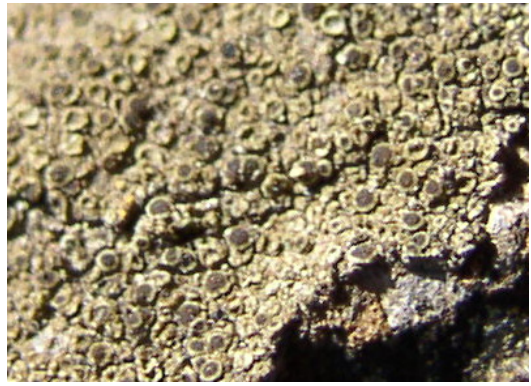
Ramalina leptocarpa

WESTERN STRAP LICHEN

Habitat: On tree branches in oak woodland and riparian areas.

Notes: Shrubby. Thallus light sage-green. In dietary experiments, moist samples of this species were the preferred food of the Big Sur Shoulder band snail. Seen here on *Salix lasieolepis*. (MDO, MBSP)

Rinodina Pepper-spore Lichen

***Rinodina* sp.**

PEPPER-SPORE LICHEN

Habitat: Rock.

Notes: Brown thallus and apothecia. (EB, MDO, HC)

Schizopolte **Fog Fingers**

Schizopolte californica

FOG FINGERS

Habitat: On coastal rocks.

Notes: Thick light grey thallus. Apothecia darker than the thallus, with lobed margins, often like a flower. Commonly found on shaded rock faces. Picture on far left is a cluster of *Schizopolte californica* that has been attacked by a fungus and is rotting away. (MBSP, EB)

Sulcaria isidiifera

SPLITTING YARN LICHEN

Status: CNPS 1B

Habitat: On shrubs and trees in the coastal scrub, maritime chaparral and oak woodland communities on old stabilized dunes.

Notes: Grey branching thallus with a longitudinal groove or split down the center of each branch. Splits filled with isidia. Believed to be endemic to the Los Osos area. No fertile specimens have ever been found. Seen here growing on the inner branches of *A. fasciculatum*. Recent surveys noted that this species is restricted to the oak woodland and maritime chaparral ecotones. (LOOR, MDO)

Teloschistes Gold-eye Lichens


Teloschistes flavicans

POWDER ORANGE BUSH LICHEN

Habitat: Woody shrubs in chaparral and open areas in oak woodlands.

Notes: Orange branching thallus and large orange apothecia. Often growing on *A. fasciculatum* and *C. cuneatus* along oak woodland ecotones (MBSP, LOOR, MDO)

Thelomma Nipple Lichens



Thelomma californicum

LOBED NIPPLE LICHEN

Habitat: Coastal rocky outcrops, in local coastal canyons on shale.

Notes: Crustose. The thallus is white and the margin is distinctly lobed. A raised collar surrounds the black spore mass of apothecia. (MDO)

Thelomma mammosum

ROCK NIPPLE LICHEN

Habitat: Coastal rocks.

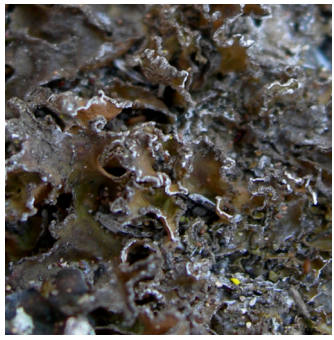
Notes: Thallus white with a raised collar that surrounds the black spore mass of apothecia. Much more common than *Thelomma californicum* and lacks large white lobes. (MBSP, MDO, EB)


Tuckermannopsis merrillii

WRINKLE LICHEN

Habitat: Woody branches in coastal scrub, chaparral.

Notes: Fruticose. Shrubby, the thallus is green to brown-green. Apothecia darker with small lobes around the margin. Often confused with *Keranfeltia californica.* (LOOR, MBSP)

***Tuckermannopsis* sp.**

WRINKLE LICHEN

Habitat: Woody branches in coastal scrub, chaparral.

Notes: Fruticose and shrubby. The thallus is green to brown-green. Apothecia darker with small lobes around the margin. Often confused with *Keranfeltia californica* and *Melanellia* species. (LOOR, MBSP)

Umbillicaria Rock Tripes



Umbillicaria phaea

EMERY ROCK TRIPE

Habitat: On coastal rocks.

Notes: Usually occurs in clusters. Brown thick, crispy thallus. Black apothecia are partially embedded. (MBSP, EB)

Usnea fragilescens

INFLATED BEARD LICHEN

Habitat: On woody branches in coastal scrub and chaparral

Notes: Highly inflated stems. Generally found growing on *Adenostoma fasciculatum* and *Ceanothus cuneatus*. A few populations were found on the inner branches and trunks of old-growth *Arctostaphylos morroensis.* (MBSP, LOOR, MDO)

Usnea rubicunda

RED BEARD LICHEN

Habitat: On woody branches in coastal scrub and chaparral

Notes: More widespread than *U. frageliscense*. Also strongly associated with *A. fasciculatum* and *C. cuneatus*. *Usnea* species have a high concentration of Usnic acid, for which they are named. (MDO, MBSP, LOOR)

Usnea glabrata

LUSTROUS BEARD LICHEN

Habitat: On woody branches in coastal scrub and chaparral

Notes: Slightly inflated branches. More widespread than *U. frageliscense*. Also strongly associated with *A. fasciculatum* and *C. cuneatus*. (MBSP, LOOR, MDO)

Usnea sp.

BEARD LICHEN

Habitat: On woody branches in coastal scrub and chaparral.

Notes: More widespread than *U. fragiliscense*. Also strongly associated with *A. fasciculatum* and *C. cuneatus*. (MBSP, LOOR, MDO)

***Usnea* sp.**

BEARD LICHEN

Habitat: On woody branches in coastal scrub and chaparral

Notes: More widespread than *U. fragiliscense*. Also strongly associated with *A. fasciculatum* and *C. cuneatus*. (LOOR, MDO, MBSP)

Verrucaria — Speck Lichens

***Verrucaria* sp.**

SPECK LICHEN

Habitat: On rock

Notes: Inconspicuous thallus and apothecia are dark grey to black. (HC, EB, MDO)

Xanthoparmelia Rock-shield Lichens




***Xanthoparmelia* spp.**

ROCK-SHEILD LICHEN

Habitat: Rocky substrates.

Notes: Whitish-green thallus with lobed margins. Apothecia are red-brown and lobed. (HC, EB, MBSP, MDO)




Xanthoria candelaria

SHRUBBY SUNBURST LICHEN

Habitat: On coastal rocks and rocky outcrops in coastal grasslands and canyons.

Notes: Thallus is foliolose (nearing fruticose). Often forms bunches or colonies. Prefers mineral rich environments such as bird colonies and rocks along the intertidal. (EB, MBSP)

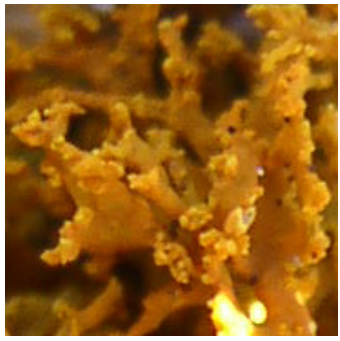

Xanthoria polycarpa

PIN-CUSHION SUNBURST LICHEN

Habitat: On wood.

Notes: Thallus is foliolose (nearing fruticose). Often forms bunches or colonies. (EB)





***Xanthoria* sp.**

SUNBURST LICHEN

Habitat: On coastal rocks, rocky outcrops in coastal grasslands and canyons.

Notes: Thallus is foliolose (nearing fruticose). Often forms bunches or colonies. Prefers mineral rich environments such as bird colonies and rocks along the intertidal. (EB, MBSP, MDO)

Documented Lichens of the Estero Bay Area

Species list compiled from field surveys conducted by Shirley Tucker,

Kerry Knudsen, and Lisa Andreano

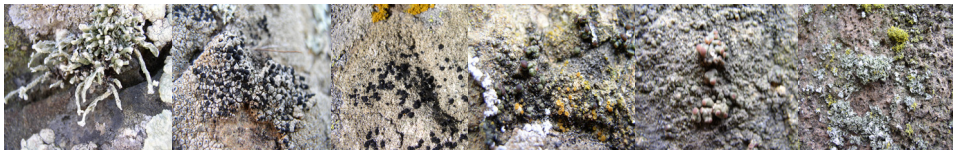
Scientific Name	Documented Substrate
Abrothallus prodiens	Parasite on *Hypogamia* with *Echinothecium reticulatum* . Found on *Adenostoma fasciculatum Arctostaphylos morroensis, Quercus agrifolia*
Acarospora sp.	rock
Anthonia radiata	*A. fasciculatum*
Arthonia chiodectella	*Artemisia californica, Ericameria ericoides, Q. agrifolia, Salvia mellifera, Ceanothus cuneatus, A. fasciculatum*
Arthopyrenia lyrata	*Q. agrifolia*
Arthopyrenia punctiformis	*A. californica, E. ericoides, A. morroensis, Q. agrifolia, S. mellifera, C. cuneatus, A. fasciculatum, Mimulus aurantiacus*
Bacidina ramea	*C. cuneatus*
Bryoria capillaris	Soil
Bryoria spp.	*A. californica, Baccharis pilularis, E. ericoides, A. morroensis, Q. agrifolia, S. mellifera, C. cuneatus, A. fasciculatum, M. aurantiacus*
Buellia alboatra	*A. californica, B. pilularis, E. ericoides, A. morroensis,Q. agrifolia, S. mellifera, C. cuneatus, A. fasciculatum, M. aurantiacus,*
Buellia halonia	Rock
Buellia halonia	*E. ericoides, Q. agrifolia*
Buellia halonia	*A. californica, B. pilularis, E. ericoides, Arctostaphylos morroensis, Q. agrifolia, S. mellifera, C. cuneatus, A. fasciculatum, M. aurantiacus*
Buellia maritima	Sandstone
Buellia muriformis	*A. californica, E. ericoides, Q. agrifolia*
Buellia oidalea	*Quercus agrifolia*
Buellia penichra	*A. californica, B. pilularis, E. ericoides, A. morroensis, Q. agrifolia, S. mellifera, C. cuneatus, A. fasciculatum, M. aurantiacus*
Buellia pullata	Rock
Buellia punctata	*A. fasciculatum*
Buellia sp.	Rock
Buellia tessellata	Rock

Calicium abietinum	*E. ericoides, Q. agrifolia, S. mellifera*
Caloplaca bolacina	Sandstone
Caloplaca cerina	*Quercus agrifolia, Ceanothus cuneatus, Adenostoma fasciculatum*
Caloplaca coralloides	Rock
Caloplaca ferruginea	*A. californica*
Caloplaca ferruginea	*A. californica, E. ericoides, A. morroensis, Q. agrifolia, C. cuneatus, A. fasciculatum, M. aurantiacus*
Caloplaca holocarpa	Dead oak wood
Caloplaca holocarpa	*A. californica, E. ericoides, A. morroensis, Q. agrifolia, C. cuneatus, A. fasciculatum*
Caloplaca luteominia luteominia	Volcanic rock and sandstone
Candelaria concolor	*A. californica, E. ericoides, A. morroensis, Q. agrifolia, C. cuneatus, A. fasciculatum*
Candelariella vitellina	sandstone
Catillaria chalybeia	bluffs
Catillaria lenticularis	sandstone
Chrysothrix candelaris	*A. fasciculatum, C. cuneatus* , *Prunus fasciculata,* and on unknown rock
Chrysothrix granulosa	On bark and rock
Cladonia asahinae	*A. californica, E. ericoides, A. morroensis, Q. agrifolia, C. cuneatus, A. fasciculatum*
Cladonia cervicornis ssp. *cervicornis*	On chaparral debis
Cladonia cervicornis ssp. *verticillata*	*Adenostoma fasciculatum*
Cladonia chlorophaea	*A. californica, E. ericoides, A. morroensis, Q. agrifolia, C. cuneatus, A. fasciculatum* and on soil
	A. californica, E. ericoides, A. morroensis, Q. agrifolia, C. cuneatus, A. fasciculatum and on Los Osos Baywood Fine Sands
Cladonia firma	
Cladonia subulata	*E. ericoides, C. cuneatus*
Cladonia verruculifera	*Q. agrifolia*
Cliostomum griffithii	*Q. agrifolia*
Collema furfuraceum	*Q. agrifolia*
Collema subnigrescens	*E. ericoides, Q. agrifolia, C. cuneatus*
Cyphelium tigillare	*Q. agrifolia, C. cuneatus*
Dermatocarpon americanum	Sandstone
Dimelaena radiata	Parasite on *Cladonia.* White rock type, *Q. agrifolia,* and *C. cuneatus*
Diploschistes muscorum	*E. ericoides, Q. agrifolia, C. cuneatus, M. aurantiacus*
Diploschistes scruposus	*Q. agrifolia, A. fasciculatum*
Echinothecium reticulatum	Parasite on *Hypogamia.* Found on *Q. agrifolia, A. fasciculatum*
Endocarpon pallidulum	Rock drainage
Evernia prunastri	*C. cuneatus, Q. agrifolia*
Flavoparmelia caperata	*C. cuneatus*
Flavoparmelia caperata	*Q. agrifolia*

Flavoparmelia sp.	Rock
Flavoppunctelia flaventior	*Q. agrifolia*
Heterodermia erinacea	*Q. agrifolia*
Heterodermia leucomela	*C. cuneatus, Q. agrifolia*
Heterodermia namaquana	*A. californica, E. ericoides*
Hypogamia enteromorpha	*A. californica, C. cuneatus*
Hypogamia imshaugii	*E. ericoides*
Hypogamia inactiva	*E. ericoides, Q. agrifolia, A. fasciculatum*
Hypogamnia mollis	*E. ericoides, Q. agrifolia, C. cuneatus, A. fasciculatum*
Hypogamia occidentalis	*E. ericoides, Q. agrifolia, C. cuneatus, A. fasciculatum*
Hypogamnia sp.	*B. pilularis*
Hypogymnia mollis	*C. cuneatus, A. fasciculatum*
Kaernefeltia merrillii	*C. cuneatus, A. fasciculatum*
Lecanactis californica	*S. lasieolepis, Q. agrifolia*
Lecania californica	*S. lasieolepis, Q. agrifolia, P. fasciculata*
Lecania crytella	*P. fasciculata*
Lecania cyanthiformis (S. cyanthiformis)	Bark and rock
Lecania dudleyi	Sandstone
Lecania fructigena	Sandstone
Lecania subdispersa	Sandstone and other lichens
Lecanora caesiorubella	*Quercus agrifolia*
Lecanora caesiorubella ssp. merrillii	*Quercus agrifolia*
Lecanora crenulata.	Sandstone
Lecanora dispersa	Sandstone bluff face
Lecanora sp.	Dead wood
Lecanora strobilina	*S. lasieolepis, Q. agrifolia*
Lecanora symmicta	*P. radiate, Q. agrifolia*
Lecanora varia	*Q. agrifolia*
Lecidella meiococca	Volcanic rock and sandstone
Lepraria xerophila	Soil surface and other lichens
Leprocaulon microscopium	Consolidated soil and other crumbling rock
Leptogium teretiusculum	Soil surface
Llimonaea californica	*Pinus radiata*
Melanelia fuliginosa	*C. cuneatus, Q. agrifolia, P. radiata*
Micarea nitschkeana	Sandstone
Mobergia angelica	Sandstone
Niebla cephalota	Rock, on bark of *Pinus radiate*, on oak
Niebla combeoides	Rock
Niebla homelea	Rock
Niebla laviaegata	Rock
Niebla tigrina	Rock
Nieblacephalota	Rock
Opegrapha herbarum	*S. lasieolepis, Q. agrifolia, P. radiate, B. pilularis*
Opegrapha xerica	*S. lasieolepis, Q. agrifolia, P. radiate, B. pilularis*

Parmelia sulcata	*Q. agrifolia*
Parmotrema chinense	*A. californica, E. ericoides, A. morroensis, Q. agrifolia, C. cuneatus, A. fasciculatum*
Parmotrema hypoleucinum	*A. californica,, C. cuneatus, A. fasciculatum*
Parmotrema sp.	*B. pilularis*
Pertusaria amara	*C. cuneatus*
Pertusaria hymenea	*C. cuneatus, A. fasciculatum*
Pertusaria rubefacta	*Q. agrifolia*
Phaeophysica sp.	Rock
Physcia adscendens	*Q. agrifolia*
Physcia tribacia	*Q. agrifolia,* rock
Physica sp.	Rock
Polysporina simplex	Sandstone
Porina chorotica	Sandstone
Pyrrhospora quernea	*Q. agrifolia*
Ramalina farinacea	*B. pilularis, Q. agrifolia*
Ramalina leptocarpha	*Q. agrifolia, B. pilularis*
Ramalina menziesii	*Ceanothus cuneatus var fascicularis Q. agrifolia* and *Ceanothus cuneatus*
Ramalina pollinaria	*B. pilularis*
Ramalina spp.	*Heteromeles arbutifolia*, *B. pilularis*
Ramalina subleptocarpha	*Q. agrifolia, P. radiate, B. pilularis*
Rhizocarpon spp.	Sandstone
Rinodina californica	Rock, bark
Rinodina californiensis	*Q. agrifolia*
Rinodina grennarii	Sandstone
Rinodina herrei	*Q. agrifolia*
Rinodina innata	Sandstone
Schizopelte californica	Rock
Sulcaria isidiifera	*A. morroensis, A. fasciculatum*
Syzygospora physciacearum	Parasite on *Heterodermia namaquana*
Teloschistes chrysothalmus	*Q. agrifolia*
Teloschistes exilis	*A. fasciculatum, Q. agrifolia,*
Teloschistes flavicans	*A. fasciculatum*
Thelomma sp.	Rock
Trapelia coarctata	Consolidated clay
Trapeliopsis granulosa	Dead wood
Tuckermannopsis chlorophylla	*C. cuneatus, A. fasciculatum*
Tuckermannopsis merrillii	*Q. agrifolia*
Tuckermannopsis orbata	*A. fasciculatum, C. cuneatus*
Tuckermannopsis platyphylla	*Adenostoma fasciculatum*
Usnea fragelescens	*A. morroensis, C. cuneatus, A. fasciculatum*
Usnea glabrata	*C. cuneatus, A. fasciculatum*
Usnea mutabilis	*C. cuneatus, A. fasciculatum*
Usnea pendulina	*C. cuneatus, A. fasciculatum*
Usnea rubicunda	*C. cuneatus, A. fasciculatum*
Usnea subfloridana	*A. fasciculatum*
Xanthoria candelaria	*Q. agrifolia, A. fasciculatum*

Xanthoria spp.	Dead wood, rock
Xanthoria polycarpa	*A. fasciculatum*



RECOMMENDED TEXTS

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Species Lists from: Kerry Knudsen, Shirley Tucker, Cal. Lichen Soc.

Cal. Native Plant Soc. list of Rare and Endangered Species