

# Rare Lichen of the Southern California Chaparral

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In Southern California lichens are frequent on chaparral, especially on chamise. The most common species are the iridescent yellow *Candelaria pacifica* M. Westb. and the bright orange *Xanthoria tenax* L. Lindblom, both of which can coat branches. In old-growth chaparral and on younger chaparral that has not burned frequently, especially in more humid micorhabitats, you can find a more diverse assemblage of leafy and branching lichens such as the blackish *Kaernefeltia merrillii* (Du Rietz) Thell & Goward, *Hypogymnia imshaugii* Krog with its hollow branches, and several small *Usnea* species looking like the green hair of trolls. In areas where fire frequency is high, often no lichens can be found for hundreds of acres.

Besides the common *Candelaria pacifica*, *Xanthoria tenax*, and the larger leafy and branching lichens, one can observe small crusts growing especially on old-growth chaparral. Based on observations from our current inventory and taxonomic work, we believe these crustose species are rapidly disappearing in southern California with increased fire frequency and reduction in chaparral habitat. This of course needs verification through ecological studies and long-term monitoring, but nonetheless we share some of our observations, which we hope will stimulate further scientific studies.

We know that two species of crustose lichens that once occurred on chaparral may now be extinct. The first is *Bacidia jacobii* (Tuck.) Hasse. This species was collected in San Diego County, probably on maritime chaparral by the botanical explorer Bolander in the 19th century. The only existing specimen of this species is in the Farlow Herbarium (FH) at Harvard University. The illustration of this species in this issue

of *The Chaparralian*, taken from the original collection by Dr. Michaela Schmuell (FH), is the first image ever published. *Bacidia jacobii* may have been naturally rare and extirpated by the clearing of chaparral during the urbanization of San Diego, with surviving populations disappearing during any number of fires. The second possibly extinct species, *Bacidia veneta* S. Ekman, was commonly in chaparral in the Santa Monica Mountains at least before 1913 (Hasse 1913). It would have been collected in several canyons, such as Santa Ynez Canyon, Santa Monica Canyon, Sullivan Canyon, and Topanga Canyon. It has never been collected outside of the Santa Monica Mountains. It may either have been an ancient relic species like the redwoods or a newly evolved species with a restricted range. These canyons all supported a rich and diverse lichen flora on the barks of trees and chaparral that has been extirpated, especially by fire (Knudsen & Kocourková 2009a & 2010). At least 105 lichens may have been extirpated from the Santa Monica Mountains since 1915, a majority on bark and wood, based on our latest unpublished historical research at Harvard, the Smithsonian Institution, and the New York Botanical Garden.

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The Pechanga *Cyphelium*. *Cyphelium brachysporum* Nádv., previously discussed in [The Chaparralian](#) (Knudsen & Kocourková. 2008), is currently exceeding rare. It was described from Murrieta in Riverside County, but now it is known only from Montaña de Oro and San Simeon in San Luis Obispo County, an area with extremely low fire frequency.

Pechanga *Cyphelium* is probably extirpated from most of southern California by the reduction of habitat by development and increased anthropogenic fires (Knudsen & Kocourková 2008; Lendemer et al. 2008).

At least two species we have recently described from chaparral and coastal sage shrub are rare and could become extinct in the next hundred years. Munz's Lecanora, *Lecanora munzii* K. Knudsen & Lendemer, was recently described from the Bernard Biological Field Station in Claremont (Knudsen & Lendemer 2009). It is known from scattered locations with low fire frequency in southern California on old growth chaparral and coastal sage shrub on dead branches and fallen wood. Some lichens that grow on native wood can grow on abandoned lumber and old untreated wood fences, but Munz's Lecanora does not appear to be able to adapt to man-made substrates. San Simeon Lecanora, *Lecanora simeonensis* K. Knudsen & Lendemer, described from San Simeon, can thrive on old ranch fences in coastal central California (Lendemer & Knudsen 2009). It is naturally found on extremely dried wood in native Monterey pine forests in Cambria and in Morro Bay Manzanita chaparral in Montaña de Oro. It was recently discovered in southern California on chamise wood in Weir Canyon in the Santa Ana Mountains but was probably extirpated in the fire of 2007 started by an arsonist (Knudsen & Kocourková 2009b). The first author and Dick Newell recently collected it on the weathered wood of a walkway in Newport's Back Bay, which means it is hopefully growing somewhere along the coast on old growth chaparral or coastal sage shrub that has escaped some of the catastrophic coastal fires in Orange County.

While we continue to study and inventory lichens on chaparral and coastal sage shrubs in southern and central California, we hope that more populations of all these species may be discovered. If new populations are discovered, they may be conserved through protection from vegetation clearance or controlled burns as well as from development. However, they cannot be protected from the catastrophic fires caused by arson or careless maintenance of power lines or other anthropogenic causes. It is generally recognized in scientific circles that we are living during a major extinction event caused primarily by humanity and that between 15-50% of all the world's more than ten million species may become extinct in the next fifty to one hundred years. Experts, of course, differ about causes and results, but we know that at least two lichen species of the southern California chaparral may be extinct and three others are apparently

so rare that they could disappear during in the next hundred years through poor management or a series of catastrophic fires.

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The possibly extinct lichen, *Bacidia jacobii*. The dark oval shapes are the apothecial discs or permanent fruiting bodies of the lichens. Photo: Michaela Schnull.

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Left: *Lecanora munzii*. Photo: J.C. Lendemer.

Below: A canvas of color-lichens in old growth chamise chaparral. Photo: Richard Halsey

