

# The Lichen Flora of Santa Barbara Island, California

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**Abstract** - This paper constitutes the second investigation of the lichens of Santa Barbara Island. The collections made on the island by Blanche Trask in 1901-1902 were previously reported by Hasse (1903a-d, 1913). The known lichen flora is increased from 22 to 64 species. A checklist of the lichen species collected on Santa Barbara Island is included.

## Introduction

A survey of the historic record indicates that Blanche Trask is the only person known to have collected lichens on Santa Barbara Island. Trask lived on Santa Catalina Island from 1895 to 1907 and during those years visited and collected plants, lichens and artifacts from all of the southern and northern Channel Islands off California. She visited Santa Barbara Island in May 1901 and again in May 1902. Her lichen collections were identified by Hermann E. Hasse, M.D., who later published the results (1903a-d, 1913). Trask's collections were lost in the California Academy of Sciences fire following the 1906 San Francisco earthquake and her personal herbarium was destroyed by the 1915 fire in Avalon. A few of her specimens survived in Hasse's personal herbarium but were dispersed among several herbaria when Hasse's collections were dispersed. A specimen from Santa Barbara Island of *Buellia punctata* is known to be at the New York Botanical Gardens. No other specimens from Santa Barbara Island collected by Trask have been located to date. A total of 22 species of lichens were recorded by Hasse (1903 a-d, 1913).

Standing in the midst of the lichen fields on Santa Barbara Island, it is hard to believe that

no one has attempted to prepare an inventory of the lichens from this lovely island. Lichens are evident everywhere on the island, are prolific in some areas and are dominant in certain habitats. The lack of a lichen flora is more a reflection of the paucity of lichen work in general rather than a reflection on the lichens of Santa Barbara Island.

## Methods and Materials

This report is the result of four collecting trips to Santa Barbara Island from 1983 to 1987. Most areas of the island were surveyed except for the cliffs and the unstable cliff tops on the southwestern portion of the island. The north-facing vertical cliffs were visited with the assistance of the island ranger who found a way to reach a single ledge on the north face.

Specimens were collected at all areas visited. Identifications were made using standard microscopic techniques and chemical spot tests. Thin layer chromatography was done on all *Niebla* specimens using Merck's aluminum sheets coated with silica gel. The solvent used was toluene (140 parts): ethylacetate (80): formic acid (8). The plates were dried, then sprayed with  $H_2SO_4$  and developed by heating in an oven at 100°C for about 10 minutes or until the norstictic acid control turned bright yellow.

Not all specimens could be identified, reflecting the state of lichen taxonomy at this time. Such collections will be available for future taxonomic workers. The identification of several specimens was provided or confirmed by lichenologists in this country and in Canada. Voucher specimens of all species are housed at the Santa Barbara Museum of Natural History and a partial set is at the National Museum of Natural History, Smithsonian Institution.

## Results

From the lichen collections made, 64 species of lichens have been identified. Of these, 16 species were found on plants and 52 species were found on rocks and/or soil. Only four species were found on both substrates.

The low number of species found on plants reflects the fact that on Santa Barbara Island there are no trees or large shrubs. The largest plant on the island, *Coreopsis gigantea*, served as the substrate for 13 of the 16 species found on plants. The distribution of lichen species within the various *Coreopsis* populations would be an interesting topic for further study. *Lycium californicum*, a small dense shrub, yielded 7 species of lichens. *Opuntia littoralis* and *O. prolifera* also have been found with lichens. It is difficult to impossible to collect lichens from cacti so only three lichen species can be confirmed from these spiny plants.

The most obvious lichens are those that grow on rocks all over the island. Even in the midst of the grasslands, wherever a rock protrudes above the surface, it is richly coated with crustose lichens of a diversity of colors.

One of the most significant lichen communities is one which is the rarely seen. This is the fog zone lichen community that inhabits north-facing vertical cliffs. Although access to these cliffs is nearly impossible, several of these lichens can be found on the north-facing slopes of Cat, Middle and Graveyard Canyons and also on the north faces of a few rock outcrops on the western side of the island. The whole north side of the island with its steep cliff faces are densely covered with these lichens. The grey color of the cliffs, as seen from the ocean, is not a mineral color, but is derived from the lichens. Fruticose lichens such as *Dendrographa leucophaea*, *D. minor*, *Rocella fimbriata*, *Combea californica* and several *Niebla* spp. form thick mats while crustose species such as *Dimelaena radiata*, *Reinkella parishii*, *Schismatomma hypoballinum* and *Opegrapha calcarea* coat any open spaces.

Orange lichens, mostly species in the genus

*Caloplaca*, are found on all parts of Santa Barbara Island. Eleven species have been identified, nine from rock substrates and two from plants. Unfortunately there are no modern taxonomic works on this genus and several species cannot be identified positively at this time.

The genus *Niebla*, a light grey-green fruticose lichen, is richly represented. One species occurs on plants and five species on rocks. Taxonomic work is incomplete and three of the species found on the island do not have validly published names. Although found in most of the island habitats, they are most prevalent on the islands south-facing cliffs.

While some lichens are abundant, others are notable for their scarcity. *Teloschistes villosus* was thought to be extinct within the United States until collected on Santa Barbara Island in 1985. It was found growing on *Lycium californicum* along the north ridge of Graveyard Canyon. In 1987 this area was inaccessible due to pelican nesting activity. A second, small population has been found in the *Coreopsis* patch on North Peak.

*Flavoparmelia caperata* is common on the adjacent mainland where its habitat is on trees. On Santa Barbara Island, it has been collected only in two very restricted locations where it grows on the ground.

It is very difficult to compare the historic record of specimens to those collected for this study. On the surface, it seems as though only 10 of the 22 species have been recollected. However, it is likely that some or all of the uncollected species were misidentified. Until the actual specimens can be located, if indeed they still exist, it remains in the realm of speculation.

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- Philbrick, R.M. 1972. The plants of Santa Barbara Island, California. Madroño 21(5):329-393.
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- Checklist of Lichen Species on Santa Barbara Island, California. (\* = not collected by the author).
- Acarospora schleicheri* (Ach.) Mass. The only bright yellow lichen on the island. Found in Cat Canyon, Signal Peak and along the west side to Elephant Seal Cove. Identified as *Lecanora zanthophana* in material collected by Trask.
- Arthonia impolita* (Ehrh. ex Hoffm.) Borr. On *Opuntia* and *Lycium* in Cat and Middle Canyons.

## Appendix 1

- Buellia cerussata* Llim. ex Werner. Common on rocks throughout the island. Identified as *Buellia stellulata* in material collected by Trask.
- Buellia halonia* (Ach.) Tuck. Found on rocks in Landing Cove.
- Buellia punctata* (Hoffm.) Mass. On rocks in Landing Cove and along the Nature Trail. Identified as *Buellia myriocarpa* and as *B. punctata punctata* in material collected by Trask.
- Caloplaca bolacina* (Tuck.) Herre. Common on rocks throughout the island. Identified as *Placodium bolacinum* in material collected by Trask.
- Caloplaca californica* Zahlbr. Found in large, conspicuous patches on the stems and branches of *Coreopsis gigantea*.
- Caloplaca cerina* (Ehrh.) Th. Fr. Lichen with small, dark orange apothecia on the twigs of *Lycium*. Identified as *Placodium cerinum* in material collected by Trask.
- Caloplaca erythrocarpa* (Pers.) Zwack. Grows on the volcanic tuff found on Signal Peak.
- \**Caloplaca flavorubescens* (Huds.) Laundon. Identified as *Placodium aurantiacum* in material collected by Trask.
- Caloplaca modesta* (Zahlbr.) Fink. On rocks along cliff top on west side of island.
- Caloplaca rosei* Hasse. Common throughout the island. Loses its characteristic lacy prothallus when it overgrows other crustose lichens.
- Caloplaca saxicola* (Hoffm.) Nordin. Fairly common, especially on north facing slopes.
- \**Caloplaca siderites* (Tuck.) Zahlbr. Identified as *Placodium cerinum sideritis* in material collected by Trask.
- Caloplaca variabilis* (Pers.) Mull. Arg. Inconspicuous on rocks on Signal Peak.
- Caloplaca verruculifera* (Vain.) Zahlbr. An uncommon sorediate *Caloplaca* on rocks on the southeastern bluff.
- Caloplaca* sp. "A". Conspicuous, especially when wet, with yellowgold thallus and rusty orange apothecia. An undescribed species also found on Santa Cruz Island.
- \**Catillaria franciscana* (Tuck.) Herre. Identified as *Biatora franciscana* in material collected by Trask.
- Cladonia pyxidata* (L.) Hoffm. Known only from one small patch on the north facing slope in Upper Cave Canyon.
- Collema crispum* (Huds.) Wigg. Large patch on ground along the trail to the landing dock.

*Combea californica* (Th. Fr.) Follm. & Geyer. Prominent fruticose lichen common in the fog zone community.

*Dendrographa leucophaea* (Tuck.) Darb. North-facing cliffs in the fog zone community. Also on *Lycium* on south-facing cliffs.

*Dendrographa minor* Darb. Fairly widely distributed in the fog zone community.

*Dimelaena radiata* (Tuck.) Hale & Culb. The most common, white crustose lichen on Santa Barbara Island. Thallus distinctly lobed.

*Diploicia canescens* (Dicks.) Mass. Common on both plants and rocks.

*Diploschistes scruposus* (Schreb.) Norm. On soil in Landing Cove.

*Dirina catalinariae* Hasse f. *sorediata* Tehler. A crustose lichen common in the fog zone community on all parts of the island.

*Endocarpon pusillum* Hedw. A small, dark brown, hard-to-find squamulose lichen found on soil and rock.

*Flavoparmelia caperata* (L.) Hale. Growing on soil in Landing Cove.

*Heterodermia* cf. *erinacea* (Ach.) Weber. Very small specimens found on rock outcrops on Signal Peak.

*Lecania brunonis* (Tuck.) Herre. A brown crustose lichen found on rock outcrops on Signal Peak.

*Lecania dudleyi* Herre. A dark brown crustose lichen found on volcanic tuff and other rocks. Signal Peak and Landing Cove.

\**Lecania spodophaeiza* (Nyl.) Smith. Identified as *Lecanora spodophaeiza* in material collected by Trask.

*Lecania syringia* (Ach.) Th. Fr. An easily overlooked species which lives on the trunks of *Coreopsis*.

*Lecanora cenisea* Ach. One of several species of grey crustose lichens. Common on pebbles at Arch Point and in Cliff Canyon.

*Lecanora dispersa* (Pers.) Somm. Another grey crustose lichen, found in Cliff Canyon.

*Lecanora horiza* (Ach.) Lindsay. A prominent, lobed crustose lichen found on *Coreopsis*.

\**Lecanora varia* (Hoffm.) Ach. In material collected by Trask.

\**Lecidea symmicta* (Ach.) Ach. Identified as *Lecanora symmicta* in material collected by Trask.

*Lecidella subincongrua* var. *elaeochromoides* (Nyl.) Hert. & Leuck. A common, yellow-green crustose lichen found on the northern part of the island.

*Leprocaulon microscopicum* (Vill.) Gams. A tiny, fruticose soil lichen found in the canyons on the east side of the island.

\**Niebla cephalota* (Tuck.) Rundel & Bowler. Identified as *Roccella ceruchis* var. *cephalota* in material collected by Trask.

*Niebla ceruchis* (Ach.) Rundel & Bowler. Common on the twigs of *Lycium*. Also found on *Coreopsis* and both *Opuntia* species.

\**Niebla combeoides* (Nyl.) Rundel & Bowler. Identified as *Roccella combioides* in material collected by Trask.

*Niebla bomalea* (Ach.) Rundel & Bowler. The most common species of *Niebla* found everywhere on the island. Identified as *Ramalina bomalea* in material collected by Trask.

*Niebla robusta* (Howe) Rundel & Bowler. On rocks primarily in the eastern canyons.

*Niebla* sp. "A". Found on rocks. Notable features are the split tips and the pycnidia. Both sorediate and esorediate morphs.

*Niebla* sp. "B". A smooth version of *N. bomalea* found on north-facing rocks.

*Niebla* sp. "C". Resembles *N. robusta* except for consistently smaller size and a shiny thallus.

*Opegrapha calcarea* Turn. ex Sm. A prominent, white-grey crustose lichen on the north-facing cliffs.

*Pannaria leucophaea* (Vahl.) Joerg. A dark brown, minutely foliose lichen that blends with its substrate.

*Peltula bolanderi* (Ach.) Wetm. A small, dark squamulose lichen found in the eastern canyons.

*Pertusaria* spp. One, possibly two, gray-brown two-spored saxicolous species not included in Dibben's 1980 monograph. Found in several locations around the island.

*Physcia aipolia* (Ehrh.) Hampe. On *Coreopsis* and on rocks in the eastern canyons.

\**Physcia comosa* (Eschw.) Mass. Probably misidentified. In material collected by Trask.

*Physcia pbaea* (Tuck.) Thoms. The most widespread species of the *Physcia* on the island.

*Physcia tenella* (Scop.) DC. On rock, wood (weather station) and *Opuntia* stems in eastern canyons.

*Physconia distorta* (With.) Laundon. Common on rock outcrops in Landing Cove.

*Polycaulina coralloides* (Tuck.) Hue. Found only once along the cliff south of Webster Point. Probably more widespread. Identified as *Placodium coralloides* in material collected by Trask.

*Ramalina evernioides* Nyl. Grows on *Coreopsis* on North Peak and on *Opuntia* along the Nature Trail.

*Ramalina farinacea* (L.) Ach. On *Coreopsis* on North Peak.

\**Ramalina fraxinea* (L.) Ach. Identified as *Roccella calicaris* in material collected by Trask.

*Reinkella parishii* Hasse. Major component of the fog zone community in eastern canyons and north-facing cliffs.

*Rinodina angelica* Stirtz. A single population collected on soil on the point east of Shag Rock.

\**Rinodina exigua* (Ach.) Gray. In material collected by Trask.

*Roccella babingtonii* Mont. Another member of the fog zone lichen community in eastern canyons and north-facing cliffs.

*Schismatomma hypoballinum* (Zahlbr.) Hasse. A white crustose lichen of the fog zone community.

\**Schismatomma pluriloculare* (Zahlbr.) In material collected by Trask.

*Siphula* sp. A sorediate, infertile soil lichen distributed as #455 in the Lichenes Exsiccati, University of Colorado Museum. Probably not a *Siphula* but no one has come up with a better name to date.

*Teloschistes villosus* (Ach.) Norm. Rare. On *Lycium* in Graveyard Canyon and on *Coreopsis* on North Peak.

*Verrucaria* cf. *glauca* Ach. Very common, dark grey crustose lichen found all over the island.

*Xanthoria candelaria* (L.) Th. Fr. This bright orange foliose lichen imparts a "fuzzy" appearance to many rocks on the island. Also found on *Coreopsis*.

*Xanthoria parietina* (L.) Th. Fr. A common lobed lichen on *Lycium* twigs and on *Coreopsis*. Probably not the *X. parietina* originally described from Europe, but until a thorough study of the genus in North America is undertaken, the name Hasse applied to this species will be used. Identified as *Teloschistes parietina* in material collected by Trask.