

Bulletin of the California Lichen Society



Volume 28 No. 2 Winter 2021

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Contents

Type specimens and endemic lichens from California.....	28
Shirley Tucker	
<i>Acarospora sinopica</i> : an art and research project	60
Zahra Jajarmikhayat	
Noteworthy collection: <i>Ramalina menziesii</i> Taylor (Ramalinaceae). – Santa Barbara Co., California.....	62
C. Matt Guilliams, Jaia M. Guilliams and Malaya J. Guilliams	
Learning about resilience from biological soil crusts.....	64
Brienne Palmer	
News and notes.....	70
President's message.....	74

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Interested in submitting an article, photo, or workshop information for an upcoming issue of the Bulletin?

The Bulletin welcomes manuscripts on technical topics in lichenology relating to western North America and on conservation of lichens, as well as news of lichenologists and their activities. The best way to submit manuscripts is by email attachments in the format of a major word processor (DOC or RTF preferred). Use italics for scientific names. Please submit figures in electronic formats with a resolution of 300 pixels per inch (600ppi minimum for line drawings); preferred minimum width for images is 2100 pixels, but widths down to 1050 pixels may be accepted. Email submissions are limited to 10MB per email, but large files may be split across several emails or other arrangements can be made. Contact Editor@californialichens.org for details of submitting illustrations or other large files. A review process is followed. Nomenclature follows Esslinger's cumulative checklist online at <https://www.ndsu.edu/pubweb/~esslinge/chcklst/chcklst7.htm>. The editors may substitute abbreviations of authors names, as appropriate from The International Plant Names Index - www.ipni.org/index.html. Style follows this issue. Electronic reprints in PDF format will be emailed to the lead author at no cost.

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Cover image: *Acarospora sinopica* art installation at Rodeo Beach, Marin County, CA. See page 63 for more information.

Type specimens and endemic lichens from California

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ABSTRACT

California, with its diverse geography and ecology, has an unusually diverse lichen flora. The updated California lichen catalogue has ~1,870 species of lichens and allied fungi. Plant and lichen collectors such as H. Bolander began sending California lichens, many of them new to science, to E. Tuckerman in the 1870's. Other early collectors include Clara Cummings, W. G. Farlow, Thomas Nuttall, C. R. Orcutt, Edward J. Palmer, J. B. Parish, and C. G. Pringle. Recent prolific collectors include H. Hasse, Ivan Johnston, W. A. Weber, A. Herre, and L. Wheeler. Collectors with most types are Bolander (37), Hasse (51), Herre (15), Knudsen (32), Nash (13), and Weber (16). John Villella published a list of recent CA type localities in California (Villella 2012). All 17 of these are confirmed in the present list. This current list has 295 total CAL types (in December, 2020). All California endemics have a California type, but not all California types are endemic. Ninety-three of the present list are CA endemics. A large number of California types occur also in Baja California, Mexico, so these are not considered CA endemics.

SPECIES LIST

Accepted scientific names are in boldface, and follow the list for North American lichens by T. Esslinger (2018). Endemic status or the lack thereof also is indicated in boldface. Synonyms, names of collectors and collection numbers are in italics. Symbols for herbaria are in brackets; they correspond to the abbreviations of institutions and other herbaria in CNALH. Lichenicolous species and allied fungi are indicated by an asterisk or #, respectively. A

question mark indicates some uncertainty about extra-California collections of the species needing verification (for *Caloplaca catalinae*, *Lecania franciscana*, *Lecideia brodoana*) or a question about the identity of the collections (*Lecanora pinguis*).

Institutional abbreviations (in brackets) indicate the location of a collection. The institutional abbreviations are given in the CNALH list, <https://lichenportal.org/>.

The type status of each collection is given where available. If only "type" is mentioned, I have put it in quotation marks or as "sic".

Holotype is THE TYPE.

An isotype is a duplicate of the holotype.

A syntype is a specimen cited in the protologue without a holotype being named.

A paratype is a specimen cited with the type in the original description of a taxon.

A paralectotype is an additional specimen from among a set of syntypes.

An isosyntype is a duplicate of a syntype.

An isolectotype is any duplicate specimen of the lectotype.

A basionym is the original name on which a new name is based.

Acarospora brattiae K. Knudsen - This species is known only from the type locality: *C. Bratt 6521*, Rancho los Flores, Los Alamos Valley, Santa Barbara Co., 1990 [UCR, SBBG]. Neither of the two collections in CNALH is designated as a type. **This is a CA endemic.**



Acarospora obpallens. Photo by Ken Kellman.

Acarospora brodoana K. Knudsen, Kocourk. & M. Westb. - There are no CA collections in CNALH. The type is *K. Knudsen 14703 & J. Kocourkova*, Dollar Lake, San Gorgonio Wilderness Area, San Bernardino Mts, San Bernardino Co. [UCR]. It is not designated as a type in CNALH. **This is a CA endemic.**

Acarospora elevata H. Magn. - There are 114 CA collections in CNALH. The type (so-called in CNALH) is *H. Hasse s.n.*, Los Angeles Co.: NE base of San Gabriel Mt [FH]. It occurs also in Colo, Wyom, & Mexico so **it is not a CA endemic.**

Acarospora erratica K. Knudsen & Kocourk. - CNALH lists only one CA collection. The holotype is San Bernardino Co.: *K. Knudsen 17026 & Kocourkova*, Smarts Ranch Rd, San Bernardino Mts, San Bernardino S F [“type” at FH; PRM, UCR]. **This is a CA endemic.**

Acarospora nodulosa (Dufour) Hue - The type for *A. nodulosa* is *H. Hasse 1329*, Palm Springs, Riverside Co. [isotypes at ASU, FH, MICH; topotype & “possible type” at US]. CNALH includes 40 CA collections. **This is not a CA endemic**, as it occurs in other western states & W Canada. Syn.: *A. reagens*, *Lecanora nodulosa*

Acarospora obpallens (Nyl. ex Hasse) Zahlbr. - CNALH lists 178 CA collections. The basionym is *Lecanora obpallens* Nyl. ex Hasse, 1897. The type (sic) is *H. Hasse 687*, near Soldiers Home, Santa Monica Mts, Los Angeles [NY]. “Possible types” of *Lecanora obpallens* & *Acarospora obpallens* are at US. **This species is not a CA endemic**, as it is also in AZ & Mexico. Syn.: *Lecanora obpallens*

Acarospora orcuttii K. Knudsen - CNALH lists three CA collections. The type is *C. R. Orcutt s.n.*, San Diego, San Diego Co., 1883 [FH]. FH has the holotype & an isotype. CNALH has none from elsewhere, so **this is a CA endemic.**

Acarospora robiniae K. Knudsen - There are 55 CA collections of this in CNALH. The type is *R. Schoeninger 411*, west side of Santa Cruz Isl., Santa Barbara Co.; the holotype is at ASU. This species has also been found in AZ [PH] & Mexico [ASU] so **it is not a CA endemic.**

Acarospora thamnina (Tuck.) Herre - The holotype of *A. interposita* is *H. Hasse 11*, Santa Monica Mts, Los Angeles Co. 0 [ASU]. There are 155 CA collections of this in CNALH. The basionym is *Lecanora thamnina* Tuck. (Tuckerman, Gen. Lich. 1872). The holotype for *Lecanora cervina thamnina* Tuck. is *H. Bolander 303*, Yosemite Valley [FH]. CNALH does not list specimens as *Lecanora thamnina*. The holotype of *Acarospora interposita* is *H. Hasse 11*, Santa Monica Mts [ASU]). This species has also been collected in AZ, Wyo., Colo, Nev, & N. Mex. so **it is not a CA endemic.** Syn.: *A. interposita*, *A. thermophila*, *Lecanora cervina* var. *thamnina* Ach.

Acarospora thelococcoides (Nyl.) Zahlbr. - CNALH has 152 CA collections. The type (sic) is *H. Hasse 570*, near Soldiers Home, foot of

Santa Monica Range, Los Angeles Co. [ASU, NY]. US has two isosyntypes & one type (sic). Additional duplicates lacking an indication as a type are at [COLO, FH, F, MICH, NY, UC]. **It is not a CA endemic** since it occurs also in Baja California.

Arthonia glebosa Tuck. - CNALH has 35 CA collections of this species. Willey said that the type is from California. It may be *H. Bolander*, Yosemite Valley (Tuckerman, 1888; not in CNALH). This species also occurs in OR, Colo, Mont. Id, Wyo., & Utah, so **it is not a CA endemic**.

Arthonia infectans Egea & Torrente - CNALH includes six US collections, all from CA. The type is a Monterey Co. collection (*J. Egea* s.n., Dollar Beach, between Big Sur & Lucia, 1989 [ASU]; in CNALH but no indication that it is a type). **It is a CA endemic**.

Arthonia lecanactidea Zahlbr. - CNALH includes 31 CA collections. The type (*H. Hasse 1316*, beach bluffs near San Pedro, 1895 [FH, F, MICH, US, WIS] was described by Zahlbruckner in 1902. FH & MICH each have two isotypes, F has a “possible type”, US has a “type”. This species is restricted to the CA Islands, & **it is a CA endemic**.

Arthonia madreana Egea & Torrente - CNALH includes two CA collections. The type is by *J. Egea*, from Point Bouchon, Diablo Canyon Power Plant, San Luis Obispo Co. [ASU]. It is listed in CNALH but without an indication of its type status. It has also been found in Mexico by W. Weber [COLO], so **it is not a CA endemic**.

Arthonia phlyctiformis subsp. **californica** Grube - CNALH includes one CA collection. The type is *S. Tucker 38638 B*, Pinnacles N.P.,

San Benito Co. [SBBG]. CNALH does not indicate the type status of this collection. **This is a CA endemic**.

#Arthonia pruinascens (Zahlbr.) Grube - CNALH lists 30 CA collections. The type for this species is *H. Hasse Exs. 51*, Santa Monica Mts, Los Angeles Co., 2003). A syntype is at PH; NY has a “type”; ASU, CAS, COLO, FH, MICH, MU, UCR] have a duplicate lacking type status. The species is also known from LA, Miss., & Mexico, so **this is not a CA endemic**. Syn.: *Arthothelium pruinascens*

#Arthonia rhoidis Zahlbr. - CNALH has 58 CA collections of this species. The type (*H. Hasse 1317*, Catalina Isl., Los Angeles Co., 1902) was described by Zahlbruckner in 1902. MICH has two isotypes. Duplicates lacking type status are at ASU, FH, MIN, MU, PH, S:S-Fungi, UC, US,VT. The species is restricted to CA Islands & nearby mainland so **it is a CA endemic** (Two from outstate, Tucker det. from Minn. & Tex., are being checked.)

#Arthonia sanguinea Willey - CNALH has 33 CA collections of this species. The type for *Arthothelium sanguineum* may be *H. Hasse Exs-131*, Catalina Isl., [ASU], although it lacks a notation about type. Duplicates of the presumed type of *Arthothelium sanguineum* are at [ASU, FH, MIN, MICH, SBBG, US], lacking an indication of type status. Duplicates under the name *Arthonia sanguinea*, without type status, are at CAS, COLO, MU, SBBG, S:S-Fungi. The species occurs also in Baja California Mexico, Africa & Cyprus, so **it is not a CA endemic**. Syn.: *Arthothelium sanguineum* (Willey) Zahlbr.

#Arthonia subdispuncta Nyl. - CNALH includes 17 CA collections of this. The type (sic) is *H. Hasse 654*, Santa Monica Range,

Sept. 1895 [US]). Three isotypes are at MICH. A duplicate collection, minus indication of type status, is at UC. It is also in Baja California, Mexico. This species has also been collected in AZ, Wyo., Colo, Nev, & N. Mex. so **it is not a CA endemic.**

Aspicilia anglica Owe-Larss. & A. Nordin - CNALH has 26 CA collections of this species. The holotype (Owe-Larsson in *Sonoran Flora*, 2007, p. 66) is from Los Angeles Co.: *B. Ryan 26434*, San Gabriel Wilderness, below Crystal Lake [ASU]. CNALH does not indicate its type status. The species name is not in Esslinger's list. It has also been found in Nevada, so **it is not a CA endemic.**

Aspicilia brucei Owe-Larss. & A. Nordin - There are 14 CA collections in CNALH. A holotype for this species (Owe-Larsson, *Sonoran Flora*, 2007, p.73) is from Riverside Co.: *B. Owe-Larsson 9161* & *K. Knudsen*, San Jacinto Mts, South Ridge [UPS has the holotype; ASU & WIS have isotypes]. The species has also been found on Guadalupe Island, Mexico, & in France, so **it is not a CA endemic.**

Aspicilia californica Rosentreter - CNALH includes 61 CA collections. An isotype for this species is *R. Rosentreter 7241a*, E end of High Peaks Trail, San Benito Range, San Benito Co. [ASU, SRP, UC; isotype at WIS]. **This is a CA endemic.**

Aspicilia confusa Owe-Larss. & A. Nordin - CNALH includes 94 CA collections. The holotype is at UPS; An isotype for this species is from Riverside Co.: *B. Owe-Larsson 9095* & *K. Knudsen*, Tenaja Cyn [ASU]. CNALH does not indicate its type status, but it is given in Owe-Larsson, *Sonoran Flora III*: p. 77. It has been collected also in Nevada, so **it is not a CA**

endemic.

Aspicilia cuprea Owe-Larss. & A. Nordin - CNALH lists 145 CA collections. The type is *B. Owe-Larsson 8480*, Kern Co.: NE of Bakersfield, Kern Canyon, Sequoia N F, ~10 km SW of Lake Isabella. CNALH lacks any indication of type status of any specimens, & does not list this number. However, Owe-Larsson (*Sonoran Flora III*, 2007, p.80) says that the holotype is at UPS, & an isotype is at ASU. This species has also been collected in Baja California, Mexico, so **it is not a CA endemic.**

Aspicilia cyanescens Owe-Larss. & A. Nordin - CNALH lists 93 CA collections . The holotype [UPS] for this species is *K. Knudsen 2858* & *J. Lendemer*, N Fork of San Jacinto River, San Jacinto Peak, San Jacinto Mts, Riverside Co. [UPS]. **This species is not a CA endemic**, as there are collections from AZ & Nev.

Aspicilia fumosa Owe-Larss. & A. Nordin - CNALH lists 56 CA collections. The type is *B. Owe-Larsson 9144*, San Jacinto Mts, North Fork, San Jacinto River [holotype at UPS]. **This is not a CA endemic**, as it has been found in Nevada.

Aspicilia knudsenii Owe-Larss. & A. Nordin - CNALH lists 15 CA collections. The type is *B. Owe-Larsson 9145* & *K. Knudsen*, San Jacinto Mts, North Fork, San Jacinto River [holotype at UPS]. **This is not a CA endemic**, as McCune identified a Wash. collection of it by Eyerdam.

Aspicilia pacifica Owe-Larss. & A. Nordin - CNALH lists 96 CA collections. The type is *T. Nash 32432*, Santa Cruz Isl., Canada del Puerto, 1,5 km SW of Prisoner's Harbor on rd to Stanton Ranch, Santa Barbara Co. [isotype at UPS, holotype & duplicate at ASU, lacking type

status designation]. **This is not a CA endemic**, as it has also been collected in Baja California, Mexico.

Aspicilia peltastictoides (Hasse) K. Knudsen & Kocourk. - CNALH includes three duplicates of *H. Hasse 861*, Palm Springs on Jan. 1, 1900 [holotypes at ASU, FH]; + “type material” in a third collection at FH. This species is known from the type locality: *H. Hasse 861*, Palm Springs, Riverside Co. [ASU, FH] & not elsewhere. **It is a CA endemic.**

Aspicilia phaea Owe-Larss. & A. Nordin - CNALH lists 126 CA collections. The type is from Riverside Co.: *B. Owe-Larsson 9158* & *K. Knudsen*, San Jacinto Mts, South Ridge [holotype at UPS]. **It is not a CA endemic**, as it has also been collected in AZ & OR.

Aspicilia praecrenata (Nyl. ex Hasse) Hue - CNALH lists 21 CA collections. The type for this species, described by Hue in 1912, is *H. Hasse 885*, Santa Monica Mts [NY, UC]. It has also been found in Nev., N. Mex. & OR. **It is not a CA endemic.**

Aspicilia santamonicae Owe-Larss. & A. Nordin - CNALH has only four CA collections. The type is *B. Owe-Larsson 9107*, Ventura Co.: Santa Monica Mts, Sandstone Peak, 2004 [holotypes at UPS, ASU]. **This is not a CA endemic** because C. Wetmore collected it in Baja California Sur, Mexico.

Bacidia jacobi (Tuck.) Hasse - CNALH lists six CA collections, & none from elsewhere, so **it is a CA endemic**. There is a lectotype of the Palmer collection from San Diego, 1875 [lectotype at FH; a “type” at US. Syn.: *Biatora jacobi*

Bacidia kingmanii Hasse - CNALH has seven collections under *Bacidia kingmanii*, & 14 collections under *Lecidea kingmanii*, by Knudsen, Lendemer, etc. The “type” is *C. C. Kingman* s.n., Mt Wilson Toll Rd, San Gabriel Mts, 28 Dec. 1910 [five collections at FH]. **It is a CA endemic.** Syn.: *Lecidea kingmanii*

Bacidia veneta S. Ekman - CNALH has nine CA collections, all by H. Hasse from the Santa Monica Mts. The type is Los Angeles Co.: *H. Hasse* s.n., on *Malvastrum*, low elevation cyps, Santa Monica Mts [holotype at US]. **It is a CA endemic.**

Bacidina californica S. Ekman - CNALH has 74 CA collections of this species, most on CA Channel Is., but possibly overlooked elsewhere. The type is *W. Weber & Santesson*, Exs. 182, Monterey Co.: Big Sur canyon [isotypes at ASU, UBC, UPS, US, WIS]. A “type” is at WTU. It has also been found in OR. Some believe it is synonymous to *B. phacodes*, a widespread species. **This is not a CA endemic.**

Bactrospora spiralis Egea & Torr. - The 23 collections in CNALH are all from CA. The type is *W. Weber* s.n., Monterey Co.: Cypress Pt., between Carmel & Pacific Grove [holotype at O; isotypes at ASU, DUKE, NY, S:S-Fungi, UBC, UPS, US, WIS]. It has also been found in N. Mex. & B. C. **This is not a CA endemic.**

***Bibbya ruginosa** (Tuck.) Kistenich, Timdal, Bendyksby, & S. Ekman - Syn.: *Toninia ruginosa* Tuck. - There are 51 CA collections in CNALH. The type is *H. Bolander 102*, CA [isotype at US]. This species also occurs in B. C., Wash., OR, & Mexico, so **this is not a CA endemic**. Syn.: *Toninia ruginosa* subsp. *ruginosa* Timdal, *Lecidea ruginosa* Tuck., *T. ruginosa*

Bryoria fremontii (Tuck.) Brodo & D. Hawksw. - The type is by J. C. Fremont, CA. [two holotypes at FH; two isosyntypes at MICH; “type?” at CUP]. CNALH has 492 CA collections of this. The species occurs widely in western states & Mexico, so **this is not a CA endemic**. Ryan (2002) said that he had seen only one CA collection from the Sonoran region, and that the species might be extirpated from the region. Syn.: *Alectoria fremontii* Tuck.

Buellia bolacina Tuck. - CNALH has 13 CA collections of this species. The possible type, fide Bungartz et al., 2004, is *C. Orcutt* s.n., San Diego Co., CA. [H-Nyl., FH]. **It is not a CA endemic**, as it has been collected in Baja California, Mexico.

Buellia capitis-regum W. A. Weber - CNALH has 84 CA collections of this species. The type is *W. Weber L-1207*, Point Reyes headland, Marin Co. [ASU]. The holotype is at ASU. This species also occurs in Baja California, Mexico, so **it is not a CA endemic**.

Buellia pullata Tuck. - CNALH has 93 CA collections of this species. An isolectotype is *H. Bolander 181*, CA. [ASU]. It has also been collected in OR & Baja California, Mexico, so **it is not a CA endemic**.

Buellia ryanii Bungartz - CNALH lists 41 CA collections. The holotype is *Nash 32448-B*, Santa Cruz Isl., Santa Barbara Co. [ASU]. There is a collection from Baja California, Mexico, so **this is not a CA endemic**.

Calicium sequoiae C. Williams & L. Tibell - CNALH includes nine CA collections of this. The type, *R. Reese Naesborg 1911*, Sonoma Co., Armstrong Redwoods State Natural Reserve [UC]. **This is a CA endemic**.

Caloplaca californica Zahlbr. - CNALH has 87 CA collections. The type is *H. Parks 2968*, San Rafael, Marin Co. [F, US]. Isotypes are at MIN, S:S-Fungi, US; those at LD & TRH:L are called the “type”. This species has been collected also in Mexico, so **it is not a CA endemic**. Syn.: *Pyrenodesmia californica*

?Caloplaca catalinae H. Magn. - CNALH includes 26 CA collections. The type for this species is *H. Magnusson* s.n., Santa Catalina Isl., Los Angeles Co. (not in CNALH). **This is a CA endemic**, although *Darrow 1702*, Santa Rita Mts, AZ [WIS]) should be checked. Syn.: *Blastenia catalinae*

Caloplaca eugyra (Tuck.) Zahlbr - CNALH includes three CA collections. The type is by *H. Hasse* s.n., Ventura Co., 1903 [two collections at FH, but lacking type status designation]. The species has been collected commonly in New Mexico, Texas, & Kansas, so **it is not a CA endemic**. Syn.: *Placodium eugyrum*

Caloplaca lecanoroides Lendemer - The only collection in CNALH is the type, *J. Lendemer 19722*, base of Bridalveil Falls, Mariposa Co.: Yosemite N.P. [NY]. **This is a CA endemic**.

Caloplaca obamae K. Knudsen - CNALH includes 13 CA collections, all from Santa Rosa Isl. The type is *K. Knudsen 8911.2*, Santa Rosa Isl., bluffs W of Verde Cyn, Santa Barbara Co., 2007 [FH, UCR, both lacking type status designation]. The type status is not given. No collections outside CA are known. This is a soil crust, usually sterile, & **it is a CA endemic**.

Caloplaca peliophylla (Tuck.) Zahlbr. - CNALH includes 34 CA collections. The basionym is *Placodium peliophyllum* Tuck. The type is *H. N. Bolander* s.n., Yosemite Valley, Mariposa Co. [“type” at FH, isotype at MICH].

This species has been collected also from Mexico, so **this is not a CA endemic**.

#Caloplaca pellodella (Nyl.) Hasse. - CNALH includes 21 CA collections. The basionym is *Lecanora pellodella* Nyl. in Hasse (Lich. S. CA., 1898). An isotype is *H. Hasse s.n.*, Riverside Co. [isotype at FH]. This species has been collected also from Mexico, so **this is not a CA endemic**.

Caloplaca sonora Wetmore - CNALH includes four CA collections. The type is from Mexico: *C. Wetmore 71747*, 5 km from Moctezuma, Sonora State [ASU, MIN] so **this is not a CA endemic**.

Caloplaca stanfordensis H. Magn. - CNALH includes 261 CA collections. The type is *L.R. Abrams s.n.*, Stanford, CA, 1901 [GB:GB]. A syntype is *A. C. Hesse 415*, California [GB:GB]. This species has been collected also from Mexico, so **this is not a CA endemic**.

Candelaria pacifica Westberg & Arup - The type is *M. Westberg s.n.*, San Luis Obispo Co., 1998 [holotype at LD]. CNALH has 583 CA collections of this. The species also occurs in AZ, OR, Wash., Nev., Colo., Minn, & Alaska. **This is not a CA endemic**.

Candelariella biatorina M. Westb. - CNALH includes 18 CA collections. The type of this rare species is *C. Wetmore 50755*, 1 mi W of Lodgepole Visitor Center, Sequoia N.P., Tulare Co., CA, 1984 [holotype at MIN]. A paratype & an isotype are at LD. It has also been found in Wyo. by C. Wetmore, so **it is not a CA endemic**.

Candelariella californica M. Westb. - CNALH lists nine CA collections. The type is *B. Ryan 24122*, Burst Rock, edge of Emigrant

Wilderness, Stanislaus N F, Tuolumne Co. [holotype at ASU]. CNALH has only CA collection, so **this is a CA endemic**.

Catapyrenium squamellum (Nyl. ex Hasse) J. W. Thomson - CNALH includes 19 CA collections. The type is *H. Hasse 792*, Santa Monica Mts, Los Angeles Co. [NY, ASU]. NY has a “type” & two “possible types” of same number. **This species is not a CA endemic** since it also occurs in AZ & other western states.

Chaenotheca longispora Reese Naesborg & Tibell - CNALH includes five CA collections, all by Reese Naesborg from Sonoma Co. The unacknowledged type is *R. Reese Naesborg 11894*, Armstrong Redwoods S P, Sonoma Co. [NY, UC, none giving type status designation]. **It is a CA endemic**.

Chrimofulvea dialyta (Nyl.) Marbach. - CNALH includes nine CA collections. The isotype is *H. Bolander s.n.*, California [isotype at US]. This species has been found in E U.S., so **it is not a CA endemic**. – Syn.: *Buellia dialyta*, *Lecidea dialyta*

Cladidium bolanderi (Tuck.) B. D. Ryan - CNALH includes 199 CA collections. The type for *Lecanora thamnitidis* Tuck. is *H. Bolander Oakland Hills* [isotype at CANB:CBG]. The type for *Lecanora bolanderi* Tuck. is *H. Bolander s.n.*, Marin Co. [FH]. MIN has three “types”: one for *Lecanora thamnitidis*, two for *Cladidium bolanderi*. FH has three “types” for *Lecanora bolanderi*, & one “type” for *Lecanora thamnitidis* [CMN:CANL has a paralectotype; F has an isoelectotype & a “type”. NBM has an isoelectotype of *C. bolanderi*. Balt has a “type” of *C. bolanderi*. US has a “type” & an isoelectotype of *Lecanora thamnitidis*. MICH has ten collections as type: the six collections of *L.*

thamnitis at MICH are denoted as isotypes; the four of *L. bolanderi* are isotypes. Rosentreter collected it in OR so **it is not a CA endemic**. Syn.: *C. thamnitis*, *Lecanora bolanderi*

Cladonia dimorpha S. Hammer - The type is *S. Hammer SH1130*, Avenue of the Giants, Rockefeller Redwood Grove, Humboldt Co. [isotype at CANB:CANB]. Paratypes are by Hammer from Marin & Del Norte Counties. CNALH has 37 CA collections of this. The species also occurs in OR, Wash., N. Caro., Dominican Republic, & Northwest Territories, Canada. **It is not a CA endemic**.

Cladonia extracorticata S. Hammer - CNALH includes three CA collections. The type is *A. A. Heller 11185*, on rock, Table Mtn 8 mi N of Oroville, Butte Co., identified by S. Hammer as holotype (FH), or Isotype [NY, US]. CNALH has none from elsewhere, so **this is a CA endemic**.

Cladonia maritima K. Knudsen & Lendemer - CNALH has 36 CA The type is *J. Lendemer 11401* & *K. Knudsen*, Upper Mateo Cyn, near Tenaya Cyn, Santa Ana Mts, Cleveland NF, Riverside Co. [NY, lacking type status designation]. CNALH has no collections from elsewhere, so **this is a CA endemic**. Misapplied name: *C. firma*

Cladonia nashii Ahti - CNALH has 146 CA collections. The type is *J. Marsh 6850*, Santa Rosa Isl., Santa Barbara Co. [holotype at ASU]. It also occurs in N C, MD, PA, Baja California, Mexico, so **it is not a CA endemic**.

Cladonia poroscypha S. Hammer - CNALH has 13 CA collections. The type is *A. Herre 214*, Pilarcitos Creek, Santa Cruz Mts, 14 Aug. 1903 [FH, paratypes at CAS & MIN]. The species also occurs in Wash.& OR. **This is not a CA**

endemic.

Cladonia pulvinella Hammer - CNALH has 61 CA collections. The type for *C. hammeri* is *T. Nash 32201*, Parsons Landing adjacent to old quarry, Santa Catalina Isl., Los Angeles Co. [holotype at ASU]. The type for *C. pulvinella* includes a holotype & two isotypes at FH of *S. Hammer 2023*, Marin Co. The species also occurs in AZ, OR, & Mexico, so **it is not a CA endemic**. Syn.: *Cladonia hammeri* Ahti

Cladonia thiersii S. Hammer - CNALH includes 43 CA collections, none from elsewhere. The type is from Marin Co.: *S. Hammer 3231*, Kehoe Beach, Point Reyes N. Seashore, Marin Co. [paratype at CANB:CANB, isotype at FH]. **This is a CA endemic**.

Cyphelium chloroconium (Tuck.) Zahlbr. - The type is *H. Bolander 190* [US; type status unknown; not in CNALH]. **This is not a CA endemic**; it was collected also in OR & Wash. Syn.: *Acolium chloroconium*

***Dacampia lecaniae** Kocourk. & K. Knudsen - No specimens of this are found in CNALH, either in CA or elsewhere. The type is *K. Knudsen 10800*, on *Lecania fuscella* on *Coreopsis gigantea*, terrace on west end of East Anacapa Isl., Ventura Co. [UCR, not in CNALH]. **This is a CA endemic**.

Dendrographa alectoroides Sundin & Tehler f. **alectoroides** Sundin & Tehler - CNALH includes 91 CA collections of the species & four of this form (none with type status given), & none from elsewhere. The type (unacknowledged in CNALH) is *A. Tehler 7062*, Point Reyes, Marin Co. [ASU]. **This is a CA endemic**.

Dendrographa alectoroides f. parva Sundin & Tehler - CNALH has 27 CA collections & none from elsewhere, so **this is a CA endemic**. The type is *A. Tehler 7061*, Point Reyes, Marin Co. [isotype at US].

#Dimelaena lichenicola K. Knudsen, Sheard, Kocouk & H. Mayrhofer - CNALH includes 11 CA collections. The type is *K. Knudsen 15179*, Upper Covington Flats, Joshua Tree N.P., Mojave Desert, Riverside Co. [isotypes at FH & NY]. UCR also has a duplicate of this number, but it lacks type status. The species occurs also in N Mex., Nev., & Utah so **it is not a CA endemic**.

Dimelaena radiata (Tuck.) Müll. Arg. - CNALH includes 596 CA collections. The basionym is *Buellia radiata* Tuck. The type (sic) is at F. The species occurs in other states so **it is not an endemic**. Syn.: *Buellia radiata*, *Rinodina radiata*

Dimelaena thysanota (Tuck.) Hale & W. L. Culb. - CNALH includes 201 CA collections. This species is based on *Rinodina thysanota* Tuck., collected by J. A. Lapman, Alpine Co. (Tuckerman, 1877; not in CNALH). It is found in the Sierra Nevada & in mountains of S CA, as well as in AZ & Mexico. **It is not a CA endemic**.

Dimelaena weberi Sheard - CNALH includes 24 CA collections. The type is by J. Sheard s.n., Catalina Isl., Los Angeles Co. 1966 [ASU, no type status indication. It has been found in San Benito Co., San Diego Co., the Channel Is., & Baja California, Mexico, so **it is not a CA endemic**.

Diplotomma penichrum (Tuck.) Szatala - CNALH has 684 CA collections of this species. The basionym is *Buellia oidalea ssp. penichra*.

The isotype is *H. Bolander s.n.*, CA, 1880 [US]. **It is not a CA endemic**, as the species has also been collected in Wash, Mont. & Mexico. Syn.: *Buellia oidalea* var. *penichra* Tuck., *B. penichra*

Dirina catalinariae Hasse f. **catalinariae** - CNALH includes 230 collections of the species, & 13 CA collections of the form. The lectotype is *H. Hasse s.n.*, on beach boulders near Avalon, Santa Catalina Isl., May 1911 [FH; type status unknown]. This species occurs also in Mexico, so **it is not a CA endemic**. Syn.: *D. catalinariae* f. *catalinariae*, *D. catalinariae* f. *sorediata*

Edrudia constipans (Nyl.) W. P. Jordan - CNALH includes 10 CA collections. The type is probably in the Nylander herbarium in Europe. This species is found only on Farallon Isl. in the Pacific Ocean off San Francisco. **This is a CA endemic**. Syn.: *Lecanora constipans*, *Placodium constipans*

***Endococcus thelommatis** Kocourk. & K. Knudsen - CNALH includes 10 CA collections, & none from elsewhere, so **this is a CA endemic**. The type is *K. Knudsen 11421*, Santa Rosa Isl., Santa Barbara Co. [two isotypes at NY].

***Endococcus zahlbrucknerellae** (Henssen) D. Hawksw. - CNALH has no collections on this. The location of the type specimen is not known, but it is presumably in the Henssen herbarium. **It is not a CA endemic**. Syn.: *Tichothecium zahlbrucknerellae*

Flavoparmelia subcapitata (Nyl. ex Hasse) Hale ex DePriest & B. Hale - The type is *R. D. Alderson s.n.*, San Diego Co. [“type” at FH]. CNALH has 24 CA collections of this. The species also is found in Baja California,

Mexico, & Venezuela so **it is not a CA endemic.**

Fulgidea sierrae (Timdal) Bendyksby & Timdal - The type for this species is *E. Timdal SON125/01*, along Hwy 2, 0.3 mi NE of Newcomb Ranch, San Gabriel Mts, Los Angeles Co. [O]. CNALH has 57 CA collections. The species also occurs in AZ. **This is not a CA endemic.** Timdal Syn.: *Hypocenomyce sierrae* Timdal

Fuscopannaria coralloidea P. M. Jørg. - There are 55 CA collections of this in CNALH. The type is *S. D. & S. Sharnoff 1323.23*, Forest Rd. 16 km SW of Ship Mtn, Six Rivers NF, Del Norte Co. [holotype at CANL]. This species has been collected in OR, Wash. & B. C., so **it is not a CA endemic.** Misapplied name: *Parmeliella lepidiota* var. *corallophora* [as var. *corallophora*], *Parmeliella lepidiota* var. *corallifera* auct.)]

Fuscopannaria crustacea P. M. Jørg. - The type, labeled *Parmeliella lepidiota*, is *A. Herre* s.n., near Congress Springs, Santa Cruz Mts, 16 Feb. 1904 [UC]. A lectotype of *Lecidea carnosa* var. *lepidiota* Sommerf. is at [O]. A type of *Fuscopannaria crustacea* is *A. Herre* s.n., near Congress Springs, Santa Clara Co. [isotype at UC]. CNALH includes 18 CA collections. This species also occurs in Wash. & OR, so **it is not a CA endemic.** Syn.: *Parmeliella lepidiota*

Fuscopannaria cyanolepra (Tuck.) P. M. Jørg. - CNALH has 110 CA collections of this. The type is *H. Bolander 263*, along American River near Auburn [“types” at CUP & US]. It occurs in other western states so **it is not a CA endemic.** Syn.: *Pannaria cyanolepra*, *Pannaria lepidiota* var. *cyanolepra*, *Pannularia lepidiota* var. *cyanolepra*, *Parmeliella cyanolepra*, *Parmeliella lepidiota* var.

cyanolepra

Fuscopannaria pulveracea (P. M. Jørg. & Henssen) P. M. Jørg. - The type is *A. Henssen 14626b*, above Bear Creek, Trinity Alps, N of Weaverville, Trinity Co. [MB; not in CNALH]. CNALH includes 12 CA collections of this species, and others from OR, Alaska & Hawaii, so **this is not a CA endemic.** Syn.: *Pannaria pulveracea*

Fuscopannaria thiersii P.M. Jørg. - CNALH includes three CA collections. The type is *H. Thiers 37236*, Mendocino Co.: Rd near Van Arsdale Dam, N of Potter Valley [ASU]. It has been reported from Ark., OR & Wash. so **it is not a CA endemic.**

Gloeoheppia squamulosa (Zahlbr.) M. Schultz - There are eleven CA collections in CNALH. The type for *Psorotichia squamulosa* is *H. Hasse 1321*, near Palm Springs, Riverside Co. (Isotype & type at FH, two isotypes at MICH]. It also occurs in AZ & Mexico, so **it is not a CA endemic.** Syn.: *Psorotichia squamulosa*

Gyalecta herrei Vezda - There are 70 CA collections in CNALH. The type (not acknowledged as such in individual listings in CNALH) is *W. A. Weber* s.n. & *R. Santesson*, Monterey Co., 1966 [FH, MSC, UC, US, WIS]. There are none known from other states, so **this is a CA endemic.**

Gyalolechia stantonii (W.A.Weber ex Arup) Søchting, Frøden & Arup - CNALH includes 137 CA collections. *W. Weber* s.n., Univ. Colo. Lich. Exs. 672, Fraser Point, Santa Cruz Isl., Santa Barbara Co., 1986 is the type. Isotypes are at ASU, CANB:CBG, CMN:CANL, LSU, MICH, NY, O, UPS, US, & WIS.LD has two “types”, & S:S-Fungi & UBC each have one “type”. Type status is unknown at F. This

species has been collected also from Mexico, so **this is not a CA endemic**. Syn.: *Caloplaca stantonii* W. A. Weber ex Arup

Gyalolechia stipitata (Wetmore) Søchting, Frøden & Arup - CNALH includes 104 CA collections. The type is *C. Wetmore 73651*, Santa Rosa Isl., Santa Barbara Co. [isotypes at ASU, KANU, LD, NY, S:S-Fungi, WIS]. The holotype is at MIN. The species is found also in Baja California, Mexico, so **this is not a CA endemic**. Syn.: *Caloplaca stipitata* Wetmore

Heterocarpon ochroleucum (Tuck.) Müll. Arg. - CNALH includes nine CA collections. The type specimen (in Gen. Lich., 1872, p.250) is in poor condition, *vide* P. Diederich [personal communication to T. Nash]. The species also occurs in Mexico so **it is not a CA endemic**. This is a lichenicolous perithecioid fungus on an unidentified host thallus. Syn.: *Endocarpon ochroleucum*, *H. Bolander* s.n., on serpentine, Mendocino Co. [two isotypes at MICH])

Hubbsia californica (Räsänen) W. A. Weber - This species has been collected only once in CA. The type specimen is from San Diego (not in CNALH, discussed in Tucker 2002), but the location of the specimen is not known. This taxon has been found commonly in Mexico, but only once, by Weber, north of Baja California in recent times. **This is not a CA endemic**. Syn.: *Reinkella californica*

Hypogymnia gracilis McCune - There are 97 CA collections in CNALH. The type is *C. Bratt 3879* & *J. Larson*, San Luis Obispo Co.: Los Osos State Reserve, Los Osos Valley Rd, 1984 (holotype at OSC; isotype at US). It also occurs in Mexico, so **it is not a CA endemic**.

Hypogymnia heterophylla L Pike - There are 249 CA collections of this in CNALH. The type

is *M. Hale 49365*, Pygmy Forest Reserve, Van Damme S P, Mendocino Co. The holotype is at US. Isotypes are at ASU, CANB:CANB, CMN:CANL, DUKE, LD, OMA, TNS:L, UPS, & WIS]. The species is also found in OR, Wash., & B. C., so **it is not a CA endemic**.

Hypogymnia minilobata McCune & Schoch - CNALH includes 78 CA collections. The holotype is *B. McCune 28589*, on *Ceanothus*, sand hills just E of Los Osos, San Luis Obispo Co. [OSU]. Its status as a CA endemic depends on verification of *Esslinger 19690*, from the Kenai Peninsula, Alaska [hb. Esslinger, with a “?”]. If confirmed, **this species is not a CA endemic**.

Hypogymnia mollis L. Pike & Hale - CNALH has 175 CA collections of this. The type is *M. Hale 57768*, San Luis Obispo Co.: Los Osos Oak Reserve, near Los Osos [holotype at US; isotypes at ASU, CANB:CANB, CMN:CANL, DUKE, LD, OMA, TNS:L, UPS, WIS]. CNALH has none from elsewhere, so **this is a CA endemic**.

Kaernefeltia californica (Tuck.) A. Thell & Goward - CNALH includes 155 CA collections. The basionym is *Cetraria californica* Tuck. The type may be by *H. Bolander s.n.* [at 18 institutions] although lacking indication of type status. This species occurs also in OR & Wash. so **it is not a CA endemic**. Syn.: *Cornicularia californica*

Lecanactis californica Tuck. - CNALH includes 309 CA collections. The type may be *A. Herre 264*, Point Lobos, San Francisco, San Francisco Co. A cotype is at MIN. Four isolectotypes are at FH. A “possible type” is at F. Isotypes are at MICH, NY, US. The species is restricted to S CA & Baja California, Mexico; **it is not a CA endemic**. Syn.: *L. zahlbruckneri*

Misapplied names: *Lecanactis abietina* (Herre, Orcutt reports)

Lecanactis dubia G. Merr. - CNALH has seven CA collections, & none from elsewhere. This species is known only on Santa Catalina Isl. The type is *L. W. Nuttall 648*, on *Lyonothamnus floribundus*, Isthmus, Santa Catalina Isl., Los Angeles Co., 1920 [“type” at FH; isotypes at F & MICH]. CNALH has no collections from outside CA, so **this is a CA endemic**.

Lecanactis salicina Zahlbr. - CNALH lists 94 CA collections of this species. The type is *H. Hasse 61*, Santa Monica Range, Los Angeles Co. [two isotypes at ASU]. FH has a lectotype, an isolectotype, & a “type”. S:S-Fungi has an isolectotype. MICH has two isotypes. NY has a syntype. F & US have a “possible type”. The species occurs in Mexico & Canada, so **it is not a CA endemic**.

#Lecania caloplacicola B. D. Ryan & van den Boom - CNALH includes only five CA collections of this endemic, limited to Santa Rosa Isl. The type is *T. H. Nash III 32682*, W end of Sandy Point, Santa Rosa Island, Santa Barbara Co. [holotype at ASU]. **This is a CA endemic**.

Lecania chalcophila B. D. Ryan & van den Boom - CNALH lists 24 CA collections, & none from elsewhere. The type is *T. H. Nash III 38717*, west end, San Nicolas Isl., Ventura Co. [holotype at ASU]. **This is a CA endemic**.

Lecania dudleyi Herre - CNALH lists 228 CA collections. The type is *A. Herre 884*, San Francisco Co., 1906. The holotype is at US. Isotype is at MIN; four “types” are at FH. This species occurs also in Mexico, so **it is not a CA endemic**.

?Lecania franciscana (Tuck.) K. Knudsen & Lendemer - CNALH lists 133 CA collections. The type is *H. Bolander s.n.*, Oakland Hills, Alameda Co., 1868 [“type” at FH]. **This species is probably a CA endemic**, although collections from AZ [WIS] & Wash. [by Eyerdam, MIN] have been reported in CNALH & need checking. Syn.: *Biatora franciscana*, *Catillaria franciscana*, *Lecanora franciscana* Tuck.

Lecania fructigena Zahlbr. - CNALH has 180 CA collections of this. The type is *H. Hasse s.n.*, Los Angeles Co. [four “types” at FH]. This occurs also in Baja California, Mexico, so **it is not a CA endemic**.

Lecania fuscelloides Ryan & v. d. Boom - CNALH has 16 CA collections of this. The type is *W. Weber & C. Bratt L-89004*, San Nicolas Isl., on caliche slope above Red Eye Beach, Ventura Co. [holotype at COLO]. This occurs also in Mexico, so **it is not a CA endemic**.

Lecania hassei (Zahlbr.) W. Noble - CNALH has 67 CA collections of this. The basionym is *Placolecania hassei* Zahlbr. The type for *L. hassei* is *C. Bratt 8555*, Sierra Blanca Ridge, Santa Cruz Isl. [holotype at SBBG; an isotype & a “type” are at NY]. The type for *Placolecania hassei* is *H. Hasse s.n.*, Topanga Canyon, Santa Monica Mts, Los Angeles Co. [5 “types” at FH; an isotype & a “type” at NY]. This occurs also in Mexico, so **it is not a CA endemic**. Syn.: *L. brattiae*

Lecania pacifica Zahl. ex Ryan & v. d. Boom - CNALH has 29 CA collections of this. The type is *v. d. Boom 29140 or 36-B*, San Luis Obispo Co.: Montana de Oro S P, Coon Creek trail [holotype at ASU]. This species occurs also in Mexico, so **it is not a CA endemic**.

Lecania ryaniana van den Boom - CNALH has 42 CA collections of this. The type is *T. H. Nash III 32683*, W end of Sandy Point, Santa Rosa Isl., Santa Barbara Co. [holotype at ASU]. This occurs only on Santa Rosa, Santa Barbara & San Miguel Is, so **it is a CA endemic**.

Lecania toninioides Zahlbr. - CNALH has 37 CA collections of this. The type is *H. Hasse s.n.*, Los Angeles Co. [three “types” at FH; one topotype at NY; two isotypes at MICH]. This species occurs also in Mexico, so **it is not a CA endemic**.

Lecania turicensis (Hepp) Müll. Arg. - CNALH has 37 CA collections of this. The type is *H. Hasse s.n.*, Santa Monica Mts, Los Angeles Co., 1909 [holotype at ASU; “type” at FH; two isotypes at MICH]. This species has also been collected in Mexico, so **it is not a CA endemic**.

Lecanographa insolita Lendemer & K. Knudsen - CNALH includes 24 CA collections. The type is *K. Knudsen 11401*, on sandstone, Lobos Cyn, Santa Rosa Isl., Santa Barbara Co. [holotype at UCR]. **It is a CA endemic**.

Lecanora albocaesiella Ryan & Nash- CNALH includes 22 CA collections. The type is *T. H. Nash 38744*, San Nicolas Isl., Ventura Co. [holotype at ASU; isotypes at NY & KANU]. CNALH includes none from elsewhere, so **this**



Lecanora mellea. Photo by Ken Kellman.

is a CA endemic.

Lecanora annularis Lendemer & K. Knudsen - CNALH includes 13 CA collections. The type is *K. Knudsen 14882.2*, side canyon above drainage to Potato Harbor, Santa Cruz Isl., Santa Barbara Co. [holotype at NY]. **It is a CA endemic**.

Lecanora austrocalifornica Lendemer & K. Knudsen - There are 39 CA collections of this in CNALH, & none from elsewhere. The type is *J. Lendemer 15000 & K. Knudsen*, Apple Canyon, San Bernardino NF, San Jacinto Mts, Riverside Co. [NY]. There are none from elsewhere, so **this is a CA endemic**.

Lecanora brattiae B. Ryan & T. Nash - CNALH has five CA collections of this, & none from elsewhere. The type is *C. Bratt 5130-B* (SBBG); N-facing slope of Cliff Cyn, Santa Barbara Isl, Santa Barbara Co [holotype at SBBG]. **This is a CA endemic**.

Lecanora californica Brodo - There are 87 CA collections of this in CNALH. The type is *M. A. Howe 131*, San Mateo Co., rocks near the sea [holotype at CANL; isotypes at FH & US]. The species is widespread in W N Amer. It occurs also in AZ & Mexico, so **it is not a CA endemic**.

Lecanora collatolica J. W. Thomson & T. H. Nash - There are ten CA collections of this in CNALH. The type is *T. H. Nash III 8071*, along CA Hwy 58, 32 km ESE of Bakersfield, Kern Co. [holotype at ASU; isotypes at MIN, WIS]. It has also been collected in Wyo. by C. Wetmore, so **it is not a CA endemic**.

Lecanora latens Printzen - There are six CA collections of this in CNALH. The type is *Printzen s. n.*, on old wood, La Cascada W of

UC field station, N side of central valley, Santa Cruz Isl., Santa Barbara Co. [ASU]. There is no indication in CNALH of the type status for this species. It also occurs in AZ, so **it is not a CA endemic.**

Lecanora mellea W. A. Weber - There are 384 CA collections of this in CNALH. The type is *W. E. Weber* s.n., SE of Sacramento between Slough House & Bridge House, Sacramento Co. [isotypes at ASU, CANB:CANB, CMN:CANL, DUKE, LD, MICH, O, S:S-Fungi, UBC, UPS, US, WIS]. A “type” is at BRY. Duplicates of this number, without type status indication, are at [FH, MSC, MIN, SBBG, UC]. Nash found this species also in Mexico so **it is not a CA endemic**

Lecanora munzii K. Knudsen & Lendemer - There are 26 CA collections of this in CNALH, most by K. Knudsen from S CA, & none from outside CA. The type is *K. Knudsen 10932* & *N. Hamlett*, Bernard Biol. Field Station, Claremont, Los Angeles Co. [isotypes at CANB:CANB, LD, NY, S:S-Fungi, TNS:L, hb. Esslinger, WIS]. **This is a CA endemic.**

Lecanora peninsularis K. Knudsen, Lendemer & Elix - CNALH includes only three U.S. collections of this species, all by Knudsen from the same Riverside Co. location. The type is *K. Knudsen 11021*, Idlewild, San Jacinto Mts, Riverside Co. [NY]. **This is a CA endemic.**

Lecanora phaeophora (Stizenb.) H. Magn. - CNALH includes only three CA collections. Lumbsch said it was known only from the type from Santa Catalina Isl., but the two Hasse collections in CNALH are from the Santa Monica Mts [FH] & near Los Angeles [MIN], respectively. **This is a CA endemic.** Syn.: *Biatora phaeophora*, *Lecidea phaeophora*

Lecanora pseudomellea Ryan - CNALH includes 169 CA collections. The type is *B. Ryan 13609*, Alpine Co., 1.6 km E of Monitor Pass on CA. Hwy 89, 25.7 km E of Markleeville [holotype at ASU]. It occurs also in OR & N. Mex., so **it is not a CA endemic.**

Lecanora remota K. Knudsen & Lendemer - CNALH includes three CA collections. The type is *K. Knudsen 17530.2*, Glass Rock, E Fork of Barton Creek, San Bernardino N F, San Bernardino Co. [isotype at NY]. CNALH includes none from elsewhere, so **it is a CA endemic.**

Lecanora simeonensis K. Knudsen & Lendemer - CNALH includes 32 CA collections. The type is *K. Knudsen 6467*, San Carpofo Creek, San Simeon S P, San Luis Obispo Co. [two isotypes at NY]. Most of the CA collections in CNALH are by Knudsen & all from CA, so **it is a CA endemic.**

Lecanora semitensis (Tuck.) Zahlbr. - CNALH includes 87 CA collections as *L. semitensis*, & seven as *L. yosemitensis*. The type for *L. yosemitensis* is *J. Lendemer 19740*, on seep slabs above the Rostrum, South Rim of Yosemite Valley, 2 mi W of Wawona Tunnel, Yosemite N.P., Mariposa Co. [FH, NY]. This species occurs N to Brit. Col. & is also in the northern Rocky Mts, so **it is not a CA endemic.** Syn.: *L. muralis* var. *semitensis*, *L. yosemitensis*

Lecanora substrobilina Printzen - CNALH includes 68 collections, from CA. The type is *C. Wetmore 73921*, Santa Rosa Isl., Santa Barbara Co., 1994 [FH]. Duplicates of this number are at FH, MIN & ASU, but without type designation. There are other collections from OR & Mexico, so **this is not a CA endemic.**

?**Lecidea brodoana** Hertel & Leuckert - CNALH has three duplicates of one CA collection. The type is *Steven & Sylvia Sharnoff 1303.11*, along Honey Run Rd, SW of Paradise, Butte Co. determined by H. Hertel [holotype at CANL]. Two duplicates lacking notation as to type status are at ASU. CNALH has a fourth collection from Wash. [FTU} . **This species is not a CA endemic.**

Lecidea californica Zahlbr - CNALH lists one CA collection, which may be the type: although lacking such notation Inyo Co.: *B. Ryan 11030*, 15 km S of Tom's Place, Eastern Brook Lakes Watershed, Sierra Nevada, Inyo NF [ASU]. There are no collections from outside CA. **This is a CA endemic.**

Lecidea cascadiensis H. Magn. - CNALH has 23 CA collections of this species. The type is *C. Wetmore 50932*, W end of Little Baldy Saddle, Sequoia N.P., Tulare Co. [holotype at MIN]. The species also occurs in OR & Wash., so is **not a CA endemic**. Syn.: *Lecidea fuscoatrina* Hertel & Leuckert

Lecidea cinerata Zahlbr. - CNALH has 63 CA collections. The type of this species was collected by *H. Hasse* from the Santa Monica Mts above Hollywood on granite rock in 1898 ["type" at NY & S:S-Fungi; syntype at PH; isotypes at FH,& MICH]. **It is not a CA endemic**, because it has been found in Wash., LA, Colo., & Slovakia.

Lecidea cruciaria Tuck. - The type is by *C. L. Anderson* s.n., Santa Cruz Isl, Santa Barbara Co. (Hertel & Prinzen 2004, p. 291], or Santa Cruz, Santa Cruz Co. [in CNALH listings]. Two "types" of the latter are at FH. There are 64 CA collections in CNALH. The species also occurs in OR, Wash., COLO, B. C., & South Africa, so **it is not a CA endemic.**

Lecidea fuscoatrina Hertel & Leuckert - CNALH has 23 CA collections of this species. The type is *C. Wetmore 50932*, W end of Little Baldy Saddle, Sequoia N.P., Tulare Co. [holotype at MIN]. The species also occurs in OR & Wash., so is **not a CA endemic.**

Lecidea hassei Zahlbr - CNALH has 93 CA collections. The type is *I. M. Johnston* s.n., head of Evey Cyn San Antonio Mts, Los Angeles Co., 1919 [FH, herb. Merrill 3162]. A duplicate lacking type designation is at ASU. This species has also been found in Nev., Colo, Sask., & Alberta, Canada so **is not a CA endemic.**

Lecidea kingmanii (Hasse) Hertel & S. Ekman - CNALH lists 14 CA collections, & none from elsewhere. The type is *H. Hasse* s.n., Griffith Park, San Gabriel Mts, Los Angeles Co. [NY, lacking type status indication]. **It is a CA endemic.**

Lecidea mannii Tuck. - CNALH has 132 CA collections of this species. The type is by *H. Mann* s.n., Mt. Diablo, Contra Costa Co. [two isotypes at MICH]. The species also is found in Wash., OR, Nev., Mont., Colo, Baja California, Argentina & Mexico. **It is not a CA endemic.** Syn.: *Lecidea atrolutescens*, *L. kalbii*

Lecidea xanthococcoides Zahlbr. - CNALH lists eight CA collections. The type is *H. Hasse 1194*, San Bernardino Mts, Riverside Co., 1899 [two isotypes at MICH]. *Lecidea xanthococcoides* **is not a CA endemic** because Nash collected it in AZ. Syn.: *Biatora xanthococcoides* (Hasse 1903e (as "xanthococci")

Lepraria pacifica Lendemer - CNALH has 37 CA collections. The type for *L. pacifica* is *J. Lendemer 19765*, on *Calocedrus*, downstream from Pohono Bridge, W end of Yosemite Valley,

Yosemite N.P., Mariposa Co., 2009 [NY]. This species includes all west-coast species containing divaricatic acid. This species also occurs in Wash., OR, ID, B. C., Spain, & Germany. **It is not a CA endemic.** Misapplied names: *L. crassissima*, *L. incana* (neither is in N. Amer.)

Leprocaulon adhaerens (K. Knudsen, Elix & Lendemer) Lendemer & Hodkinson - CNALH has 72 CA collections. The type is *K. Knudsen 2700*, Torrey Pines S. Natural Reserve, San Diego Co. [isotypes at ASU & CANB:CANB]. The species has also been collected in N. Caro. & OR, **so it is not a CA endemic.** Syn.: *Lepraria adhaerens*

Leprocaulon americanum Lendemer & Hodkinson - CNALH has 31 CA collections. The type is *K. Knudsen 9715*, trail to Flat Rock, Torrey Pines S P, San Diego Co. [holotype at NY, isotype at PRM-Knudsen]. This species has also been collected in Colo. ID, B C., **so it is not a CA endemic.** Misapplied names: *L. microscopicum*

Leprocaulon knudsenii Lendemer & Hodkinson - CNALH has one CA collection. The type is *K. Knudsen 9256*, lower Fremont Cyn, Santa Ana Mts, Orange Co. [holotype at NY; duplicate lacking type designation at UCR]. It has been collected from the Los Angeles area, N to Marin Co. CNALH lists collections from Wash. & Chile, **so this is not a CA endemic.**

Leprocaulon santamonicae (K. Knudsen & Elix) Lendemer & Hodkinson - CNALH has ten CA collections, & none from elsewhere. The type is *K. Knudsen et al. 4380*, Griffith Park, E end of Santa Monica Mts, Los Angeles Co. [O, without type designation]. **This is a CA endemic.** Syn.: *Lepraria santamonicae*

Leprocaulon terricola (Lendemer) Lendemer & Hodkinson - CNALH has 29 CA collections, & none from elsewhere. The type is *K. Knudsen 10606*, Upper Cherry Cyn, Santa Rosa Isl., Santa Barbara Co. [holotype at NY; duplicate lacking type designation at UCR]. **This is a CA endemic.** Syn.: *Lepraria terricola*

Leprocaulon textum (K. Knudsen, Elix & Lendemer) Lendemer & Hodkinson - CNALH has 29 CA collections of this species, and none from elsewhere. The type is *K. Knudsen et al. 5153*, Party Rock, above Carlisle Valley, Santa Monica Mts, Ventura Co. [isotype at ASU; duplicates at NY, UCR both lacking type designation]. **It is a CA endemic.** Syn.: *Lepraria texta*

Letharia gracilis Krokken ex McCune & Altermann - CNALH has 24 CA collections. The type is *B. McCune 27031*, Siskiyou Mts, trail to Youngs Valley from Private Lake, Siskiyou Co. [holotype at OSC]. This species occurs also in OR **so it is not a CA endemic.**

***Lichenodiplis dendrographae** Diederich & van den Boom - CNALH includes two collections, both from CA. The type is *P. v. d. Boom 28902*, S of Morro Bay, State Park Rd, N of Museum of Natural History, San Luis Obispo Co. [holotype at ASU]. This species is a lichenicole on *Dendrographa leucophaea*. **& it is a CA endemic.**

***Lichenodiplis rinodinicola** Kocourk. & K. Knudsen - CNALH includes no CA collections of this. The type is *J. Kocourkova 7323* & *K. Knudsen*, Leo Carrillo S P, Nicolas Flats, near the lake, on *Rinodina* sp., Santa Monica Mts., Los Angeles Co. [PRM]). **It is not a CA endemic,** because the single collection in CNALH is from Ontario, Canada.

#**Lichenothelia arida** Muggia, Kocourk. & K. Knudsen - CNALH includes 52 CA collections of this, all by Knudsen. The type is *K. Knudsen 16329*, Hexie Mts along Pleasant Valley, Joshua Tree N.P., Riverside Co. [paratype at PRM-Knudsen; duplicate of number, lacking type designation at UCR]. CNALH has no collection of this from outside CA. **It is a CA endemic.**

#**Lichenothelia scopularia** (Nyl.) D. Hawksw. - CNALH includes 36 CA collections of this; 13 are by Weier. The type is *S. A. Plummer* s.n., Santa Barbara Co. [FH, lacking type designation]. It occurs widely but uncommonly across N. Amer. so **it is not a CA endemic.** Syn.: *Microthelia aterrима*, *Rinodina aterrима*

#**Lichenothelia umbrophila** Muggia, Kocourk. & K. Knudsen - CNALH includes 22 CA collections by K. Knudsen, & none from elsewhere. The type may be Riverside Co.: *K. Knudsen 130790.2*, Joshua Tree N.P. [UCR, lacking type designation]. **This is a CA endemic.**

***Llimoniella acarosporicola** (Kocourk. & K. Knudsen) Diederich & Ertz - CNALH lists three CA collections including two duplicates, all from Orange Co., & none from outside CA. The type is *K. Knudsen 9236*, Fremont Cyn, Santa Ana Mts, Orange Co. [isotype is at MSC; duplicate of number, lacking type designation, is at UCR]. **This is a CA endemic.** Syn.: *Gelatinopsis acarosporicola* (Kocourková & Knudsen [2009a, c]).

Lopadium dodgei Herre - CNALH includes four CA collections. The type is *A. Herre* s.n., Pacific Grove, Monterey Co., 1949 [“type” at US] on *Quercus agrifolia*. The four CA collections in CNALH are all by Herre from Pacific Grove, Monterey Co., & there are no other reports, so **this is a CA endemic.**

Massalongia microphylliza (Nyl. ex Hasse) Henssen - CNALH lists 41 CA collections. The basionym is *Pannularia microphylliza* Nyl. ex Hasse. An isotype is *H. Hasse 790 [796]*, San Gabriel Mts, 1897 [NY]. This species has been found also in Utah & ID, so **it is not a CA endemic.** Syn.: *Pannularia microphylliza*, *Pannularia ruderatula*, *Parmeliella ruderatula*, *Placynthium dubium*, *P. microphyllizum*

Melanelixia californica A. Crespo & Divakar - There are 130 CA reports in CNALH. The type is from San Diego Co. This species has also been found in Colo. & Mexico, so **it is not a CA endemic.** Syn.: *Melanelia glabra* for N. Amer. reports

Miriquidica scotopholis (Tuck.) B. D. Ryan & Timdal - CNALH includes 156 CA collections. The type for *Biatora scotopholis* is *H. Bolander 73765*, on maritime rocks, Alameda Co. [an isotype & a “type” at FH; an isotype at NY]. It is also found in Wy., ID, UT & Baja California, Mexico, so **it is not a CA endemic.** Syn.: *Biatora scotopholis*, *Lecidea scotopholis*

Miriquidica verrucariicola (B. D. Ryan) K. Knudsen & Kocourk. - CNALH includes 20 CA collections of this species, & none from outside CA. No type is indicated for any entry, but the earliest CA collection is *W. A. Weber* s.n., Fraser Point, Santa Cruz Isl., Santa Barbara Co., 1966 [COLO]. It occurs also in Baja California, Mexico & Sinaloa, **This is a CA endemic.** Syn.: *Lecanora verrucariicola* B. D. Ryan, *Protoparmelia ryaniana*

***Mixtoconidium nashii** (Hafellner) Etayo & van den Boom - There are no collections of this in CNALH. The species is known only from the type on *Niebla robusta* on West Anacapa Isl., Ventura Co. [collector is probably K. Knudsen [UCR]]. **It is a CA endemic.** Syn.: *Plectocarpon*

nashii

Mobergia angelica (Stizenb. in Hasse) H. Mayrh. & Sheard - CNALH includes 284 CA collections. The basionym is *Rinodina angelica* Stizenb. in Hasse, [*A. Herre* s.n., Los Angeles [paratype at F, “type” at US (“type” is *C. Orcutt* s.n., San Diego [FH, MICH]; *R. dirinoides* Zahlbr. *H. Hasse* s.n., Los Angeles Co (“possible isotype” at US)] This species occurs also in Mexico, so **it is not a CA endemic**. Syn.: *Rinodina angelica*, *R. bolodes* Tuck. ex Fink

#Monerolechia californica (H. Magn.) Elix. - CNALH has 63 CA collections. The basionym is *Rinodina californica* H. Magn. (Acta Horti Gothenb. 3:169, 1927); its type is presumably in Europe. No type is listed for *Monerolechia californica*. This occurs also in Mexico, so **it is not a CA endemic**. Syn.: *Dimelaena californica*

***Muellerella lecanactidis** Diederich & van den Boom - CNALH lists two CA collections, (four duplicates in all), of which three are by K. Knudsen from Pt. Loma, San Diego Co. The type is *P. van den Boom 28909*, State Park Rd, N of Museum of Natural History, S of Morro Bay, San Luis Obispo Co. [holotype at ASU]. There are no known collections of this from outside CA. **It is a CA endemic**.

#Mycocalicium sequoiae Bonar - All 11 collections in CNALH are from CA. The type is *L. Bonar 1380*, Crescent Meadow, Giant Forest, Sequoia N F, Tulare Co., 1 July 1935 (isotypes at F, FH, MICH, MSC, NY). No collections from outside CA are known. **This is a CA endemic**.

Mycoporum californicum (Zahlbr.) R. C. Harris - CNALH lists 20 CA collections. The

basionym is *Mycoporellum californicum*. The type is *H. Hasse* s.n., Los Angeles Co. [one isotype & six duplicates lacking type designation at FH]. It also has been found in N. J., Fla, LA, & Hawaii, so **this is not a CA endemic**. Syn.: *Mycoporellum californicum*, *Tomasellia californica*

Myriospora hassei (Herre) K. Knudsen & L. Arcadia - CNALH includes 46 CA collections. The type for *Acarospora hassei* is *A. Herre 757*, Santa Cruz Mts, Castle Rock, Santa Cruz Co. [“possible type” at F; four “types” at FH; two isotypes at MICH; isolectotype at NY]. The same collection is listed as the isolectotype for *Silobia hassei* [NY]. It has also been collected in Utah & Colo. so **it is not a CA endemic**. Syn.: *Acarospora dispersa*, *A. hassei*, *Silobia hassei*

Naetrocymbe herrei K. Knudsen & Lendemer - CNALH lists 13 CA collections of this species. The type for *Naetrocymbe herrei* is *A. Herre 889*, Pt. Lobos, San Francisco [isotype at CAS, MIN; two paratypes at US]. A different collection (*K. Knudsen 10128*, San Simeon S P, north of Elephant Seal Vista, San Luis Obispo Co.) is a holotype for *Naetrocymbe herrei*. No collections are known from elsewhere, so **it is a CA endemic**. - Syn.: *Arthopyrenia herrei* (no type status given in CNALH)

Niebla cephalota (Tuck.) Rundel & Bowler - CNALH lists 468 CA collections. The type is *D. Anderson* s.n., on dead wood, Santa Cruz, Santa Cruz Co. [FH, not in CNALH]. The species occurs from Wash. state S to Baja California, Mexico, so **it is not a CA endemic**. Syn.: *Desmazieria cephalota*, *Ramalina ceruchis* f. *cephalota*, *Roccella ceruchis* f. *cephalota*, *Vermilacinia cephalota*

Niebla ceruchoides Rundel & Bowler - CNALH reports 272 CA collections. The type is *W. Weber s.n.* & *C. Bratt*, Santa Barbara Co., Mt. Diablo [isotype at F]. *R. Santesson* collected it in Chile, so **this is not a CA endemic**.

Niebla laevigata Bowler & Rundel - CNALH reports 175 CA collections. The type is *R. Riefner 87-394*, Coon Creek Cyn, Montana d'Oro S P, San Luis Obispo Co. [holotype at ASU, 0]. A different collection, *R. Splut 9074*, Baja California Norte, Mexico is called an isotype at DUKE. Other collections are known from Mexico, so **this is not a CA endemic**.

Niebla polymorpha Bowler, Marsh, Nash & Riefner - CNALH lists 35 CA collections. The type is *J. Marsh 6206*, Santa Catalina Isl., Los Angeles Co. [holotype at ASU]. Other collections are reported from Mexico, so **this is not a CA endemic**.

Niebla procera Rundel & Bowler - CNALH lists 120 CA collections. The type is *R. Riefner 87-100*, Morro Bay S P, San Luis Obispo Co. [holotype at ASU; duplicates lacking type designation at UCR, COLO]. This has been collected also in Mexico, so **this is not a CA endemic**.

Niebla tuberculata Riefner, Bowler, J. E. Marsh, & T. H. Nash - CNALH lists only four collections, all from the Morro Rock Preserve in CA. The type is *R. Riefner 93-8*, on dacite cliffs, Morro Rock Reserve, Morro Bay, San Luis Obispo Co. [COLO, UCR, neither with type status indicated]. UCR has a duplicate of this number, but it lacks type designation. **This is a CA endemic**. Syn.: *Vermilacinia tuberculata*

Opegrapha erosa Egea & Ertz - CNALH lists 14 collections of this, all from CA. The type is

W. Weber & Santesson L-42084, on *Cupressus*, Cypress Point, 17-Mile Drive between Carmel & Pacific Grove, Monterey Co. [holotype at COLO]. **This is a CA endemic**.

Opegrapha umbellulariae Zahlbr. - There are 17 collections in CNALH, all from CA., & none from elsewhere. The type is *H. E. Hasse s.n.*, Malibu Cyn, Santa Monica Mts ["type" at FH, "possible type" at NY, two isosyntypes at MICH]. **This is a CA endemic**.

Paraschismatomma ochroleucum (Zahlbr.) K. Knudsen, Ertz & Tehler - CNALH includes 81 CA collections. The type for *Chiodecton ochroleucum* is *B. Trask s.n.*, Santa Catalina Isl., Los Angeles Co. ["type" at FH]. The type for *Platygrapha plurilocularis* is *H. Hasse*, Santa Catalina Isl., Los Angeles Co. [syntype at PH; "possible type" at F]. The type for *Schismatomma pluriloculare* is *H. Hasse 1318*, Catalina Isl., Los Angeles Co. [two isotypes at MICH; two "types" at FH] Collections from Baja California, Mexico are also reported, so **this is not a CA endemic**. The species may possibly have been extirpated in CA. Syn.: *Chiodecton ochroleucum*, *Platygrapha plurilocularis*, *Schismatomma pluriloculare*

Parmotrema herrei (Zahl.) Spielmann & Marcelli - CNALH includes eight CA collections. The type is *A. Herre 825*, Pilarcitos Creek Canyon, Santa Cruz Mountains, [a holotype, an isotype, & two "types" at FH] ! *S. Tucker*. The species is not reported from elsewhere so **it is a CA endemic**. Syn.: *Parmelia herrei*

Peltigera gowardii Lendemer & H. O'Brien - CNALH includes 18 CA collections of *P. gowardii* and 121 collections as *P. hydrothyria*. Two types for *Hydrothyria venosa* are *H. Bolander s.n.*, Mariposa Co., 1866 [isotype at

ASU] and J. Russell, Windham, VT, 1851 [isotypes at ASU, S:S-Fungi]; CANB:CBG; one “type” at Y; two “types” at FH; a lectotype & two isolectotypes at NY; a syntype at LSU, Tenn & US; four isosyntypes at MICH]. The type for *P. gowardii* is *T. Goward* s.n., Trophy Mts., 22 km ENE of Clearwater Village, B. C. [isotype at DUKE]. The type for *Peltigera hydrothyria* is *H. Bolander* s.n., Mariposa, 1866 [ASU]. The species occurs widely across N. Amer. in PA, NY, OR, Wash., etc. If *P. gowardii* is considered distinct, **it is a CA endemic.** Syn.: *Peltigera hydrothyria* Mladl. & Lutzoni, *Hydrothyria venosa* J. L. Russell

Peltula bolanderi (Tuck.) Wetmore - CNALH includes 142 CA collections. The type is *H. N. Bolander 242*, on rocks, Ukiah, Mendocino Co. [“type” at FH; lectotype at F]. The species also occurs in AZ & Colo. **so it is not a CA endemic.** Syn.: *Endocarpiscum bolanderi*, *Heppia bolanderi*, *Pannaria bolanderi* Tuck.

Peltula hassei (Zahlbr.) Büdel, Kauff & Bachran Syn.: *P. obscurans* var. - CNALH includes 19 CA collections. The type for *Heppia hassei* is *H. Hasse s.n.*, on granite, Palm Springs, Riverside Co. [a”type” & an isotype at FH, two isotypes at MICH]. It also occurs in AZ & Baja Mex. **so it is not a CA endemic.** Syn.: *Heppia hassei*

Peltula zahlbruckneri (Hasse) Wetmore - CNALH includes 155 CA collections. The type for *Heppia zahlbruckneri* is *C. C. Kingman* s.n., CA, 1911 [isotype at FH]. The type for *Peltula zahlbruckneri* is *H. Hasse* s.n., on quartz, Rubio Cyn, San Gabriel Mts, near Pasadena, Los Angeles Co. [MIN, F, UC, none with type status]. This species also occurs in AZ **so it is not a CA endemic.** Syn.: *Heppia zahlbruckneri* Hasse

Pentagenella akompsa (Tuck.) Perlmutter, LaGreca, Ertz & Tehler - CNALH has nine CA collections. The type for *Biatora akompsa* is *H. Bolander 336*, on *Pinus insignis*, Pescadero, San Mateo Co. [lectotype at FH]. Specimens in CNALH include Wash. Chille, & possibly Canada (a *J. Macoun* specimen). **It is not a CA endemic.** - Syn.: *Biatora akompsa* Tuck.

Pertusaria brattiae Lumbsch & T. H. Nash - CNALH lists 70 CA collections. The type is *T. Nash 33024*, Santa Rosa Isl., South Point, Santa Barbara Co. [holotype at ASU]. This also occurs in Mexico, **so it is not a CA endemic.**

Pertusaria californica Dibben - CNALH lists 76 CA collections. The type is *A. Herre 263*, Sutro Heights, San Francisco [holotype at DUKE, isotype at NY]. It also occurs in OR & Baja California, Mexico, **so it is not a CA endemic.**

Pertusaria flavicunda Tuck. - The type may be *J. G. Cooper* s.n., San Diego, 1865 [two lectotypes at MICH]. CNALH has 288 CA collections. It is also found in Mexico, **so it is not a CA endemic.**

Pertusaria islandica Bratt, Lumbsch & Schmitt - CNALH lists seven CA collections, most from San Miguel Isl. The type is *T. Nash 41265*, San Miguel Isl., Santa Barbara Co. [a paratype at ASU]. This species was collected in Mexico by Mayrhofer, **so it is not a CA endemic.**

Pertusaria lecanina Tuck. - The type is *H. Bolander s.n.*, on *Aesculus californica* & *Pinus insignis*, foothills, San Diego [ASU, MICH, neither with indication of type status]. CNALH has 145 CA collections. It has also been collected in Wash. & other western states, **so it is not a CA endemic.**

Pertusaria occidentalis Bratt, Lumbsch & Schmitt - CNALH lists seven CA collections. The type is *T. Nash 29645*, Peninsula Vizcaino, Baja California Sur, Mexico. [a holotype is at ASU], so **it is not a CA endemic**.

#**Phylliscum demangeonii** (Moug. & Mont.) Nyl. - The type for *Collema demangeonii* is in France. CNALH has seven CA collections. This species also occurs in many other parts of North America as well as Europe, so **is not a CA endemic**. Syn.: *Thyrea demangeonii*, *Collema demangeonii*

Physcia duplicorticata W. A. Weber & J. W. Thomson - CNALH includes 21 CA collections, of which 14 are duplicates of the Weber collection. The type is *W. A. Weber s.n. & G. Kunkel*, 1.6 km E of junction on Nicasio-Point Reyes Rd E of Inverness, Marin Co. [isotypes at ASU, CANB:CANB, CMN:CANL, DUKE, FH, O, S:S-Fungi, UBC, UPS, US; a “type” at US; a paratype & an isotype at WIS]. This species has only been found in one location in CA & not elsewhere, so **it is a CA endemic**.

Physconia californica Essl. - CNALH lists 46 CA collections. The type is *C. Wetmore 50497*, CCC camp at Yucca Creek, N Fork of Kaweah River, Sequoia N.P., Tulare Co. [holotype at MIN]. It also occurs in Baja California, Mexico so **it is not a CA endemic**.

Physconia fallax Essl. - CNALH includes 100 CA collections. The type is *C. Bratt 11189*, Ozena Cpgd, Lockwood Valley Rd, Los Padres NF, Ventura Co. [holotype at DUKE; isotype at herb. Esslinger]. It also occurs in Baja California, Mexico, so **it is not a CA endemic**.

Physconia isidiigera (Zahlbr.) Essl. - CNALH includes 808 CA collections. The type is *A. Herre 365*, on old roof in Mayfield, Santa Clara

Co. [two isotypes at MIN]. It occurs also in OR so **it is not a CA endemic**. Syn.: *Physcia isidiigera*, *Physcia pulverulenta* subsp. *isidiigera*, *Physconia grisea* f. *isidiigera*

Placidium californicum Breuss - CNALH includes 24 CA collections. The type is *C. Bratt 8241*, San Nicolas Isl., Ventura Co. [ASU, SBBG; neither has type status indicated]. It also occurs in AZ, N. Mex., & Baja California, Mexico so **it is not a CA endemic**.

Placopyrenium caeruleopulvinum (J. W. Thomson) Breuss - CNALH lists 11 CA collections. The type is *T. Nash 8449*, San Bernardino Co., 2 mi SW of Parker Dam on Colorado River [isotype at ASU; isotype & paratype at CMN:CANL]. It also occurs in AZ & Wyo. so **it is not a CA endemic**. Syn.: *Catapyrenium caeruleopulvinum* [“type” at WIS].

Placopyrenium heppioides (Zahlbr.) Breuss - The type is *H. Hasse 3047*, Topanga Cyn, Santa Monica Mts [two “types” are at FH]. CNALH has ten CA collections of this. It has also been collected in AZ & Mexico. & **is not a CA endemic**. Syn.: *Dermatocarpon heppioides*

Placopyrenium stanfordii (Herre) K. Knudsen - CNALH includes 44 CA collections of this species. The type is *H. Hasse 3034*, Topanga Canyon, Santa Monica Mts, 1911 [isotype at US, duplicate at UCR, lacking type status designation]]. **It is not a CA endemic**, because it has been collected in several other western states & Mexico. Syn.: *Dermatocarpon zahlbruckneri* Hasse [two “types” at FH].

Placynthiella knudsenii Lendemer - CNALH lists 22 CA collections. The type is *K. Knudsen 389*, on soil, Wildomar, Menifee Hills, Riverside Co. [two isotypes at ASU; holotype &

an isotype at NY]. It has also been found in Mich, MO, & N.], so **it is not a CA endemic**.

Platismatia stenophylla (Tuck.) W. L. Culb. & C. F. Culb. - CNALH lists 196 CA collections. The type is *H. Bolander 384* CA, 1873 [PH, lacking note re. type status]. It also occurs in OR & Wash. so **it is not a CA endemic**. Syn.: *Cetraria stenophylla*, *Cetraria lacunosa* var. *stenophylla*

Polycauliona brattiae (W. A. Weber) Arup, Frøden & Søchting - CNALH lists 100 CA collections of this. The type is *W. Weber & C. Bratt* s.n., Santa Cruz Isl., W end, Santa Barbara Co. [isotypes at ASU, CANB:CBG, CANL, LSU, MICH, NY, O, UPS, US,WIS].LD, S:S-Fungi & UBC have a “type”. The type status is unknown for the F collection. It has also been collected in Mexico, so **it is not a CA endemic**. Syn.: *Caloplaca brattiae* W. A. Weber

Polycauliona bolacina (Tuck.) Arup, Frøden & Søchting - CNALH has 473 CA collections of this common species. The basionym is *Placodium bolacinum* Tuck. (Tuck., Lich. CA., 1866). The type is *H. Bolander 121*, Alameda Co., Oakland Hills, N of Eldredge Ranch, 1864 [isotype at US]. It has also been collected in Mexico, so **it is not a CA endemic**. Syn.: *Caloplaca bolacina*, *Placodium bolacinum* Tuckerman (1866)

Polycauliona coralloides (Tuck.) Hue - CNALH includes 331 CA collections. The basionym is *Placodium coralloides* Tuck. (Tuckerman, Proc. Amer. Arts & Sci.6: 287). The type is *H. Bolander* s.n., San Francisco, San Francisco Co. Isotypes are at CANB:CBG,CMN:CANL, MICH, US, WIS. Type status is not recorded or duplicates at BAL, BG,COLO, DUKE, F, FH, MAINE, MSC, UC, Y. This species has been collected

also from Mexico, so **it is not a CA endemic**. Syn.: *Placodium coralloides*, *Caloplaca coralloides*

Polycauliona ignea (Arup) Arup, Frøden & Søchting - CNALH includes 224 CA collections. The type is *H. Hasse* s.n., Los Angeles Co., CA [FH]. The type status is not known for Hasse collections from this location at ASU, COLO, CUP, FH, MIN, MU, & SBBG. This has also been collected in Baja California, Mexico, so **it is not a CA endemic**. Syn.: *Caloplaca ignea*

Polycauliona impolita (Arup) Arup, Frøden & Søchting - CNALH includes 216 CA collections. The type is *U. Arup 89542*, Prisoners Harbor, Santa Cruz Isl., Santa Barbara Co., 1989 [holotype at LD; isotypes at LD & MIN]. It has also been collected in Mexico, so **it is not a CA endemic**. Syn.: *Caloplaca impolita*

Polycauliona ludificans (Arup) Arup, Frøden & Søchting - CNALH includes 135 CA collections. The holotype is *U. Arup* s.n., Point Dume, Los Angeles Co. [LD]. This has been collected also from Mexico, so **it is not a CA endemic**. Syn.: *Caloplaca ludificans* Arup

Polycauliona luteominia (Tuck.) Arup, Frøden & Søchting var. **bolanderi** - CNALH includes 76 CA collections. The type is probably *H. Hasse* s.n., Santa Monica Range, Los Angeles Co. [MU, lacking type status designation]. This species has been collected also from Mexico, so **it is not a CA endemic**. Syn.: *Caloplaca luteominia* (Tuck.) Zahlbr. var. *bolanderi* (Tuck.) Arup, *Placodium ferrugineum* f. *bolanderi*

Polycauliona luteominia (Tuck.) Arup, Frøden & Søchting var **luteominia** - CNALH includes

230 CA collections. The “possible type” is *H. E. Parks & W. K. Parks L112/555*, Camp Kearny Mesa, San Diego, San Diego Co. [F]. This has been collected also from Mexico, so **it is not a CA endemic**. Syn.: *Caloplaca luteominia* var. *luteominia* Arup, *Placodium luteominium*

Polycauliona phryganitis Tuck. - CNALH includes 131 CA collections. The isotype for *Polycauliona phryganitis* is H. Bolander [WIS]. The isosyntype for *Lecanora phryganitis* is *A. Zahlbruckner 23*, San Francisco Co. [NY]; there are two “types” of the latter at FH. CNALH includes none from outside California, so **this is a CA endemic**. Syn.: *Lecanora phryganitis* Tuck. (*H. Bolander*, from Mission Dolores to ocean, San Francisco Co. [FH])

Polycauliona pollinarioides (K. Knudsen) K. Knud., Kocourk., Hodkova & Wang Syn.: *Xanthoria pollinarioides* L. Lindblom & D. M. Wright - CNALH has 32 CA collections. Lindblom (2004) first reported this species from Marin Co. The type is *R. Robertson 3188*, Trail-head to Marshall Beach at parking lot, Point Reyes, Marin Co. [UC, lacking type status designation]). **This species is not a CA endemic**, as St. Clair collected it in Colo.

Porina peregrina Tretiach & P. M. McCarthy - CNALH includes five CA collections, by Nash & Nimis at the same time & place. The type is *P. L. Nimis 18316 & Tretiach*, below Barton Point, Santa Rosa Isl., Santa Barbara Co. [isotypes at ASU, MIN]). **This is a CA endemic**.

Protoparmeliopsis pinguis (Tuck.) S. Y. Kondr. - CNALH includes 244 CA collections. The type is *H. Bolander* s.n., CA (“possible type” at US; ”type” at DUKE, FH, MIN, WIS; isotypes at F, MICH. Collections by Nash, Weber, Rundel [ASU, MIN, BYU] under this name may be *L. xanthosora*, fide Ryan et al.



Polycauliona pollinarioides. Photo by Ken Kellman

2004. *Protoparmeliopsis pinguis* occurs in B.C. & Mexico. **This is not a CA endemic**. Syn.: *Lecanora pinguis*

Pseudothelomma occidentale - CNALH has 110 collections of this species. The type is *Acolium* sp., by *C. F. Baker 436*, foothills near Stanford University, Santa Clara Co. [lectotype at F; isotypes at MICH, MU]. It also is found in OR, Brit. Col., Alaska & Yukon, so **this is not a CA endemic**. Syn.: *Cyphelium caliciforme*, *C. occidentalis* Herre, *Thelomma occidentale* (Herre) Tibell

Psora californica Timdal - CNALH includes 96 CA collections, The type is *I. M. Johnston 3180*, in rock crevices, Evey Canyon, San Antonio Mts, Los Angeles Co., 1918 [holotype at FH]. This species also occurs in Mexico so **it is not a CA endemic**.

Psora hyporubescens Timdal - CNALH includes 22 CA collections. The type is *C. Bratt & E. Timdal 7052*, 1.24 mi up Mt. Wilson Rd from Angels Crest Hwy, San Gabriel Mts, Los Angeles Co. [holotype at O]. CNALH includes none from elsewhere. **This is a CA endemic**.

Psora pacifica Timdal - CNALH includes 220 CA collections. The type is *W. A. Weber & C. Bratt* s.n., Lich. Exs. Colo. No 664, on soil,

upper end of Islay Cyn, a few mi SW of Univ. of CA Research Station, Santa Cruz Isl., Santa Barbara Co. [isotype at ASU, CANB: CANB, CANL, DUKE, F, LD, LSU, MICH, NY, UPS]; holotype and isotype at O; “type” at S:S-Fungi & UBC]. It also occurs in Mexico so **it is not a CA endemic.**

Ramalina puberulenta Riefner & Bowler - CNALH includes 148 CA collections. The type is *R. E. Riefner 89-375*, along G-14 Rd at US Hwy 101, Monterey Co. [isotypes at ASU, DUKE]. This species is limited to the central coast of CA, so **it is a CA endemic.**

Ramalina sarahae K. Knudsen, Lendemer, & Kocourk. - This species is from the CA Channel Is. CNALH has ten collections, most by Knudsen from CA. The type is *K. Knudsen 17653*, San Miguel Isl., Cabrillo Monument, Santa Barbara Co. [two isotypes at NY; holotype & isotype at PRM-Knud.]. **It is a CA endemic.**

Ramboldia gowardiana (T. Scrib. & Hauck) Kalb, Lumbsch & Elix - CNALH lists 11 CA specimens. The type is *D. Toren 898*, Lake Co.: Bottle Rock Rd [paratypes at ASU; holotype at CMN:CANL]. It also occurs widely in OR, Wash., ID, & B. C. so **it is not a CA endemic.** Syn.: *Pyrrhospora gowardiana*

Ramonia ablephora (Nyl. ex Hasse) R. C. Harris - CNALH lists eight CA collections. The type is *H. E. Hasse 798*, Santa Monica Mts, Los Angeles Co. [holotype at NY]. None are known from elsewhere; **it is a CA endemic.** Syn.: *Lecidea ablephora*

Ramonia extensa Lendemer - CNALH has no collections of this. The type is probably *L. Sigal* s.n., Lake Co. (not in CNALH). **It is a CA endemic.**

Ramonia gyalectiformis (Zahlbr.) Vezda - *R. gyalectiformis* is known from 21 collections from seven sites in S CA. The type is *H. E. Hasse 1322*, San Jacinto Mt., Riverside Co. [“type” at MIN & NY]. None are known from elsewhere. **This is a CA endemic.** - Syn.: *Bacidia gyalectiformis*

Ramonia vermisporea Lendemer & K. Knudsen - CNALH lists only one CA collection, the holotype: *J. C. Lendemer & K. Knudsen 11377*, along Thomas Mtn Rd, Thomas Mountain, San Jacinto Mts, Riverside Co. [holotype at NY]. **This is a CA endemic.**

#Rhizocarpon dimelaenae Timdal - CNALH lists 11 CA collections. The type is *C. Bratt, Neel, & T. Timdal 7062*, on *Dimelaena oreina* on rock wall, Jacoby Cyn, San Bernardino N F, San Bernardino Co. [holotype at O]. This species forms a juvenile parasite on *Dimelaena oreina*. It also occurs in AZ & Nev. **so it is not a CA endemic.**

Rhizoplaca glaucophana (Nyl. ex Hasse) W. A. Weber - CNALH includes 63 CA collections. The type is *H. Hasse* s.n., near Dell’s Camp, San Antonio Cyn, San Gabriel Mts, Los Angeles Co. [isotype at NY; “type” at US]. It also occurs in Wyo., & Baja California, Mexico, so **it is not a CA endemic.** Syn.: *Harpidium glaucophanum*, *Lecanora glaucophana*

Rhizoplaca marginalis (Hasse) W. A. Weber - CNALH includes 83 CA collections. The type is *H. Hasse* s.n., on lava & basalt rocks, near Little Lake Station, Inyo Co., alt. 1000 m., [two “types” at FH, two isotypes at MICH]. It has also been found in Nev., Wis., & Brit. Col., **so it is not a CA endemic.** Syn.: *Lecanora marginalis*

Rinodina badiexcipula Sheard - CNALH includes 77 CA collections. The type is *T. Tønsberg 14696*, Del Norte Co., along US route 199 just S of the Oregon-CA border [isotype at ASU; BG]. It also occurs in OR so **it is not a CA endemic**.

Rinodina bolanderi H. Magn. - CNALH includes 192 CA collections. The type is a *H. Bolander* collection from San Francisco, Mission Dolores, [two duplicates lacking type designation at ASU; holotype [?] at H-Nyl. 28731]. It also occurs in Wash., B. C., & Baja California, Mexico so **it is not a CA endemic**.

Rinodina californiensis Sheard - CNALH includes 90 CA collections. The type is *I. Tavares 1323*, ~ 3 mi E on Spring Mtn Rd from Calistoga-Santa Rosa Rd, Sonoma Co. [two duplicates lacking type designation at UC]. It also occurs in OR, B. C., & Baja California, Mexico, so **it is not a CA endemic**.

Rinodina capensis Hampe - CNALH includes seven CA collections. The type is *B. Ryan 25080-b*, SW of Scott's Bar, Klamath N F, Siskiyou County [ASU, lacking type designation]. It also occurs in AZ, OR, N. Mex., & B. C. so **it is not a CA endemic**. Syn.: *R. aurantiaca*.

Rinodina endospora Sheard - CNALH includes 49 CA collections. The type is *Alice Q. Howard* s.n., Santa Clara Co., Mt. Hamilton Range San Antonio Valley [two duplicates lacking type designation at UC]. It also occurs in Nev. so **it is not a CA endemic**.

Rinodina herrei H. Magn. - CNALH includes 150 CA collections. The type was collected by *A. Herre* s.n., Pt. San Pedro, San Mateo Co. [two duplicates lacking type designation at ASU]. It also occurs in Baja California, Mexico,

so **it is not a CA endemic**.

Rinodina innata Sheard - CNALH includes 30 CA collections. The type is *J. Sheard 51281-a*, Santa Cruz Isl., Santa Barbara Co. [holotype at ASU]. It also occurs in Baja California, Mexico, so **it is not a CA endemic**.

Rinodina santae-monicae H. Magn. - CNALH includes 133 CA collections. The type for *R. thomsonii* is *W. Noble 7409*, Vancouver Isl., B. C., Canada [CMN:CANL]. The type for *R. santaemonicae* is *H. Hasse* s.n., Santa Monica Range, CA. 1914 [SBBG, lacking type status]. This species also occurs N to Wash. so **it is not a CA endemic**. Syn.: *Rinodina thomsonii* Sheard

Rinodina terricola Sheard & K. Knudsen - This species has been collected eight times in CA (by Hasse & Knudsen). The type is *K. Knudsen 6203*, Weir Cyn, Santa Ana Mts, Orange Co. [holotype at FH; UCR, lacking type status]. It has also been found in Galiano Bay, B. C., Canada. **It is not a CA endemic**.

Sarcogyne arenosa (Herre) K. Knudsen & S. M. Standley - CNALH includes 84 CA collections. The type is *A. Herre 540*, hills 4 mi W of Stanford Univ., Santa Cruz Mtns. [isotype [at ASU, MIN, UC, US; "type" at FH; isolectotype at FH]. It also occurs in AZ, Nev., ID, Kans., N. J., so **it is not a CA endemic**. Syn.: *Acarospora arenosa*

Sarcogyne bernardinensis K. Knudsen, J. N. Adams, Kocourk. & Y. Wang - CNALH includes no collections of this species. The type is *K. Knudsen et al. 1240*, San Bernardino Co.: Holcomb Valley, San Bernardino Mts, San Bernardino N F [UCR, lacking type status]. This is newly described, so it is too early to speculate whether it is a CA endemic.

Sarcogyne crustacea K. Knudsen & Kocourk. - This terricolous species has been collected five times in CA (including three duplicates of one collection by Knudsen). The holotype for *Biatorrella terrena* is *H. E. Hasse* s.n., North Fork, San Gabriel Canyon, Los Angeles Co. [holotype at FH]. **It is a CA endemic.** Syn.: *Biatorrella terrena*

Sarcogyne mitziae K. Knudsen, Kocourk. & McCune - CNALH includes nine CA collections of this species, all by Knudsen in S CA. The type is *K. Knudsen 16361*, above Pinnacles Trail, Pinnacles, San Bernardino Mts, San Bernardino Co. [NY, UCR, both lacking type status designation]. **It is a CA endemic.**

Sarcogyne plicata H. Magn. - CNALH includes 55 CA collections. The type is *H. E. Hasse 132* pr.p., Eden Hot Springs, Riverside Co., 1915 [isotype at FH]. This species is fairly common in CA, & has also been collected in Nev. **It is not a CA endemic.**

Sarcogyne similis H. Magn. - CNALH lists 13 CA collections. The type is *K. Knudsen 6435*, Weir Canyon, Santa Ana Mts, Orange Co. [isotypes at ASU, PRM-Knudsen]. It is reported also from VA, W VA, PA, & KY. **It is not a CA endemic.** Syn.: *S. reebiae*

***Sarcopyrenia bacillosa** (Nyl. ex Hasse) Nav.-Ros. & Hladun - CNALH includes 12 CA collections. The type is *H. E. Hasse 914*, Santa Monica Mts, Los Angeles Co., 1897 ["type" at FH; isotype at MICH; type and "possible type" at NY; syntype at PH; duplicate number lacking type designation at UC]. **It is not a CA endemic**, because B. Ryan collected it in Wash. Syn.: *Hassea bacillosa*, *Verrucaria bacillosa*

Schismatomma rediunta (Hasse) Tehler - CNALH includes 50 CA collections, and none

from elsewhere. The type is *H. E. Hasse 351* or *835*, Santa Catalina Isl., Los Angeles Co. ["types" at NY]. **It is a CA endemic.** Syn.: *Dirina rediunta*, *Lecanora rediunta*

Schizopelte crustosa Ertz & Tehler - CNALH lists 110 CA collections. The type is by *E. Palmer* s.n., San Diego Co., 1875 ["type" at FH]. This species occurs also in Isla Cedros, Baja California, Mexico, so **it is not a CA endemic.** Syn.: *Chiodecton californicum*, *Llimonaea californica*, *Phaeotrema californicum*, *Sclerophyton californicum*, *Thelotrema californicum*

***Sclerococcum pleiospermum** (Triebel) Ertz & Diederich - CNALH has four CA collections, none with any type status, & none from elsewhere. This species has been found only on Santa Rosa & Santa Cruz Islands, Santa Barbara Co. The type is presumably in a European herbarium. This is a lichenicole on *Lecanora caesiorubella*. **This is a CA endemic.** Syn.: *Dactylospora pleiosperma*

Scytinium californicum (Tuck.) Otalora, P.M.Jørg., & Wedin - CNALH has 316 CA collections. The type may be *H. Bolander* s.n., CA [syntype at FH]. The species occurs also in Wash., OR, ID, Wyo., Colo., B C., Mexico, so **it is not a CA endemic.** Syn.: *Leptogium californicum* Tuck.

Scytinium platynum Otalora, P.M.Jørg., & Wedin - CNALH has 52 CA collections. The type is *H. Bolander*, on rocks among mosses, Auburn, 1865 ["type" at FH]. This species occurs also in Wash., OR, B. C., & Mexico. **This is not a CA endemic.** Syn.: *Leptogium platynum*, *L. californicum* f. *platynum* Tuck.

Scytinium singulare T. Carlberg & P. M. Jørg. - CNALH has four CA collections of this, and

none from elsewhere. The type for this species is a Carlberg collection from Santa Cruz Co., CA. [isotype at US; herb. Carlberg]. **This species is a CA endemic.**

Sigridea californica (Tuck.) Tehler - CNALH has 429 CA collections. The type is *H. Bolander 129*, Oakland, Alameda Co., 1866 [isotypes at CANB:CBG, MICH, US; isolectotypes at CMN:CANL, FH, NY, S:S-Fungi; isotype & “type” at WIS]. It also occurs from OR to Baja California, Mexico, so **it is not a CA endemic.** Syn.: *Dirina californica*

***Skyttea pertusariicola** Died. & Etayo - CNALH lists seven CA collections. The type is *T. Nash 38760*, San Nicolas Isl., downslope from Theodolite Rd, Ventura Co. [holotype at ASU]. CNALH lists collections of this from Portugal (coll.: P. Diederich), so **this is not a CA endemic.**

***Skyttea tavaresiae** R. Sant., Etayo, & Diederich - CNALH includes three CA collections by Knudsen from one locality. The type is *Tønsberg 25475*, SE of Ranger Station, San Miguel Isl., Santa Barbara Co. [BG, lacking type status designation]. **This is not a CA endemic**, because T. Tønsberg collected it in Wash., & it also occurs in Norway. It is lichenicolous on *Pyrrhospora quernea*.



Sigridea californica. Photo by Ken Kellman

Solenopsora crenata (Herre) Zahlbr. var. **crenata** - This species is rare, with 19 CA collections made by six individuals; ten of the collections are from the Channel Islands. The type is *A. C. Herre* s.n., Point Lobos, San Francisco, CA [not in CNALH]. ASU has a collection from Wyoming under this name (R. Solheim, Teton Co. [ASU]), but it is an unlikely determination. **This is probably a CA endemic.** Syn.: *Placolecania crenata*

Solenopsora cyathiformis (Szatala) van den Boom - CNALH includes 16 CA collections. The type is *H. E. Parks* s.n., La Jolla, San Diego Co. [isotype at F; UC; “type” at GB:GB & US; duplicates at COLO, MIN, NY, & UC, lacking type designation]. This species is also known from Baja California, Mexico, fide van den Boom & Ryan, but no Mexican collections are known. **It is not a CA endemic.**

***Sphaerellothecium breussii** K. Knudsen, Kocourk. & Etayo - CNALH includes eight CA collections of this. The type is *K. Knudsen 4770.2, V. Reeb & S. Werth*, U. CA. Dawson Preserve, Vista, San Diego Co., [UCR, lacking type status designation]. It is a lichenicole on *Placidium lacinulatum* in old-growth chaparral. **This is a CA endemic.** Syn.: *Stigmidium catapyrenii*

***Stigmidium californicum** K. Knudsen & Kocourk. - CNALH includes three CA collections, all by K. Knudsen, on East Anacapa Isl. & San Nicolas Isl. The type is *K. Knudsen 11145*, on *Caloplaca stanfordensis* on *Coreopsis gigantea*, west end of East Anacapa Isl., Ventura Co. [UCR, lacking type status designation]. **This is a CA endemic.**

***Stigmidium epistigmellum** (Nyl. ex Vouaux) Kocourk. & K. Knudsen - CNALH includes 56 CA collections. The type is *H. E. Hasse* s.n.,

Santa Monica Mts, Los Angeles Co. [isotype at MICH; holotype at H-NYL]. No collections of it are known from elsewhere. **This is a CA endemic.** Syn.: *Mycoporellum epistigmella*

***Stigidium hesperium** Kocourk. & K. Knudsen & Diederich - CNALH includes four CA collections (plus three duplicates). The type is *P. Diederich 16787* & *D. Ertz* from China Rock, on *Caloplaca coralloides*, along coast S of Asilomar, Monterey Co. [isotypes at NY, UPS]. This is lichenicolous on *Caloplaca coralloides*. **This is not a CA endemic** because Nash collected it in Baja California, Mexico.

Sulcaria isidiifera Brodo - This species occurs only in San Luis Obispo Co. in central CA, with 38 CA collections. The type is *C. Bratt & J. Larson* s.n., San Luis Obispo Co., Jan. 8, 1984 [isotype at US]; *M. E. Hale* s.n., San Luis Obispo Co., July 31, 1980 [paratype at CANL]. **It is a CA endemic.**

Sulcaria spiralifera (Brodo & D. Hawksw.) Myllys, Velmala & Goward - CNALH includes 38 collections, all from one place in CA, & is considered threatened. The type, named by Brodo, is *I. Brodo* s.n., Siskiyou Co., [paratypes at CMN:CANL; isotype at OSU]. It occurs also in OR, **so is not a CA endemic.**

Texosporium sancti-jacobi (Tuck.) Nádv. - The type is *C. G. Pringle* s.n., on earth on mesas, San Diego ["type" at FH; VT, lacking type status designation]. CNALH has 92 CA collections. It also occurs in OR, ID, & Wash., **so it is not a CA endemic.** Syn.: *Acolium St. Jacobi*

Thalloidima massatum (Tuck.) Kistenich, Timdal, Bendyksby & S. Ekman - CNALH has 31 CA collections of this species. The type is *H. Bolander*, on soil near the sea, CA. (not in

CNALH). This species also occurs in AZ, N Mex., Mexico, & Europe, **so it is not a CA endemic.** Syn.: *Lecidea massata* Tuck., *Toninia massata*

Thelenella hassei (Zahlbr.) H. Mayrh. - The type is *H. E. Hasse* s.n., Santa Monica Range, Los Angeles Co., [four "types" at F; isotypes at S:S-Fungi, MICH]. CNALH includes 67 CA collections, & none from elsewhere, **so it is a CA endemic.** Syn.: *Microglæna hassei*

Thelocarpon hassei de Lesd. - CNALH has no CA collections of this species. The type is *H. E. Hasse* s.n., San Jacinto Mts. The original collection was destroyed in the WWII bombing of Dunkirk, France, & there are no known collections. It may be extirpated. **This is a CA endemic.**

Thelomma brunneum (W. A. Weber) M. Prieto & Wedin - CNALH has 15 CA collections of this. The type is *W. A. Weber L-42724*, Santa Catalina Isl., Los Angeles Co. [isotypes at ASU, DUKE, FH; "type" at COLO]; two duplicates lacking type status designation at COLO, MSC, UC]. This species also occurs in Baja California, Mexico. **This is not a CA endemic.** Syn.: *Cyphelium brunneum*

Thelomma californicum (Tuck.) Tibell - CNALH lists 136 CA collections. The basionym is *Trachylia californica* Tuck. The type for *Thelomma californicum* is *H. Bolander* s.n., Oakland Hills, Alameda Co. [isotypes at CANB:CBG, WIS]. There are collections from OR, Wash. & Canary Is., **so this is not a CA endemic.** Syn.: *Cyphelium californicum*

Thelomma santessonii Tibell - CNALH includes 141 CA collections of this. The type is *R. Santesson 17960*, San Clemente Isl., Los Angeles Co. [isotypes at LD, S:S-Fungi, US].

Other collections of this species are known from Mexico, so **this is not a CA endemic**.

Thelopsis isiaca Stizenb. - CNALH includes 18 CA collections of this species. The type is *H. Hasse* s.n., Malibu Cyn, Santa Monica Mts, Los Angeles Co., 1898 [isotype at MIN]. This species also occurs in Mexico so **this is not a CA endemic**. Syn.: *T. subporinella*

Tingiopsisidium sonomense (Tuck.) Hafellner & T. Sprib. - CNALH includes 45 CA collections. The type (status not acknowledged) is by *H. Hasse* s.n. [FH, MIN, US]; no details are available. The species also occurs in AZ, OR, & Mont. so **it is not a CA endemic**. Syn.: *Koerberia sonomensis*, *Pannaria sonomensis*, *Vestergrenopsis sonomensis*

Toninia nashii Timdal - There are only four CA collections in CNALH, from two Channel Is. The type is *T. Nash 41464*, San Miguel Isl., Santa Barbara Co. [holotype at ASU]. **It is a CA endemic**.

***Toninia subdispersa** (Nyl. ex Hasse) K. Knudsen - There are 49 CA collections in CNALH. The type is *H. Hasse 897*, Santa Monica Mts [two lectotypes at NY]. CNALH has 49 CA collections of *Toninia subdispersa*. The type for *Lecanora subdispersa* is the same [isotype at MIN, lectotype & isolectotype at NY; "type" at US; holotype? at H-Nyl. 5318]. This species occurs also in Mexico, so it is not a CA endemic. Syn.: *Lecanora subdispersa*

Topelia californica P. M. Jørg. & Vezda - There are 48 CA collections in CNALH. The type is *A. Herre* s.n., Stanford University, near Natural History Museum [isotype at NY]. This occurs only in the CA. Channel Is. **It is not a CA endemic** because K. Kalb collected it in Baja California, Mexico [WIS}.

Topelia gyalectodes (Nyl.) B. D. Ryan & H. T. Lumbsch - CNALH includes only three CA collections of this species (two by *H. Hasse*, one by *R. Riefner*), & none from elsewhere. The type is *H. E. Hasse 929*, Malibu Canyon, Santa Monica Mts, 1898 [isotypes at FH, NY]. **It is a CA endemic**. Syn.: *Lecanora gyalectodes* Nyl.

Trapeliopsis glaucopholis (Nyl. ex Hasse) Printzen & McCune - CNALH includes 327 CA collections. The type is *H. Hasse* s.n., San Gabriel Mts, Los Angeles Co., 1896 ["type" at MIN; isotype at NY]. It has also been collected in OR, Wash., ID, Pa, & Europe. **It is not a CA endemic**. Syn.: *Biatora granulosa* var. *phyllizans*, *Lecidea admiscens*, *L. glaucopholis*, *L. granulosa* var. *phyllizans*, *T. californica*, *T. wallrothii* (in part)

***Tremella dendrographae** Diederich & Tehler - CNALH lists four collections, all from CA, and none from elsewhere. The type is *C. Bratt 5863*, Morro Bay S P, San Luis Obispo Co. [holotype at S:S-Fungi]. CNALH lists none from elsewhere, so **this is a CA endemic**.

***Tremella nieblae** Diederich & van den Boom - CNALH includes three CA collections of this species, & none from elsewhere. The type is *van den Boom 29018* on *Niebla cephalota*, Point Lobos State Reserve, Monterey Co. [ASU]. (This collection is labeled *Tremella ramalinae* Died. in CNALH). **This species is a CA endemic**.

Trichoramalina crinita (Tuck.) Rundel & Bowler - CNALH has 42 packets representing eight collections, 37 of which were collected before 1910. The type for *R. crinita* is *C. R. Orcutt*, on *Euphorbia misera* shrubs, San Diego, 1863 ["type" at F; isotypes at MICH]. The "type" for *Trichoramalina crinita* is the same ["type" at S:S-Fungi]. It also occurs in Mexico,

so **it is not a CA endemic**. Syn.: *Ramalina crinita*

***Trimmatostroma dendrographae** Diederich, Ertz, U. Braun & Heuchert - CNALH lists four CA collections of this species, & none from elsewhere. The type is *P. Diederich 16789*, Point Lobos State Reserve, Monterey Co. [isotypes at NY; duplicate number, lacking type status designation at UCR]. **It is a CA endemic**.

Trimmatothelopsis oreophila (K. Knudsen) K. Knud., Kocourk., Hodkova & Wang - There are 19 CA collections of this in CNALH. The type is *K. Knudsen 3459*, Idyllwild, near Inspiration Pt, San Jacinto Mts, Riverside Co., 4 Aug. 2005 [ASU, DUKE]. Isotypes of this collection are at ASU & DUKE. The species was also found in Nevada by St. Clair, so **it is not a CA endemic**. Syn.: *Acarospora oreophila*

Trimmatotheliopsis terricola (H. Magn.) K. Knudsen & Lendemer - CNALH lists 36 CA collections of *Acarospora terricola*. The type of *T. terricola* is *H. Hasse s.n.*, Santa Monica Mts, Los Angeles or Ventura Co. [none in CNALH]. The species also occurs in OR, Nev, Wash., & Brazil. **It is not a CA endemic**. Syn.: *Acarospora terricola*

Tuckermannopsis orbata (Nyl.) M. J. Lai - Note: CNALH lists 558 CA collections. The type for *Tuckermannopsis orbata* is *H. Bolander s.n.*, on pine, CA [FH; isotype at S:S-Fungi]. It occurs along the Pacific coast N to Alaska, & across much of the US, so **is not a CA endemic**. Syn.: *Cetraria orbata*, *Nephromopsis californica*, *Platysma orbatum*

Umbilicaria angulata Tuck. - CNALH lists 41 CA collections. The type is *A. Menzies s. n.*, Monterey, Monterey Co. [“type” is at MIN & FH]. The species occurs along the Pacific coast

to Alaska, so **is not a CA endemic**.

Umbilicaria phaea Tuck. - CNALH has 910 CA records of this species. The type is by H. Bolander 11, coastal rocks, Pacific coast, 1866 [isotypes at CANB:CBG, CMN:CANL, DUKE, S:S-Fungi, MICH; two “types” at US, one each at WIS & YPM:YU; “type” & lectotype at FH; isolectotype at NY; duplicates with same number but lacking type status designation at MSC, O, UC]. This species also occurs in Mexico, so **it is not a CA endemic**.

Vahliella californica (Tuck.) P. M. Jørg. - CNALH lists 29 CA collections. The type is *H. E. Hasse s.n.*, Los Angeles Co. [FH & MICH have duplicates of this collection, lacking type status designation]. It also occurs in AZ, Wash., Brit. Col., so **it is not a CA endemic**. Syn.: *Fuscopannaria californica*, *Pannaria microphylla f. californica*

Vahliella labrata (P. M. Jørg.) P. M. Jørg. - CNALH includes five CA collections from three S CA locations. The type is *C. Bratt 6257*, on soil in rock crevices, headlands W of Coches Prietos, Santa Cruz Isl., Santa Barbara Co. [SBBG, lacking type status designation], determined by P. M. Jørgensen. No collections are known from elsewhere, so **this is a CA endemic**. Syn.: *Fuscopannaria labrata*

Verrucaria aspecta Breuss - This species has been found only on Santa Rosa Isl.; CNALH includes two collections, from CA, & none from elsewhere. The type is *C. M. Wetmore 73757*, secondary peak on E side of Sierra Pablo, Santa Rosa Isl., Santa Barbara Co., CA [ASU & UCR, both lacking type status designation]. It also has been collected by Advaita in Iowa. **It is not a CA endemic**.

#**Verrucaria bernardinensis** Breuss - CNALH includes 38 CA collections. The type is by *K. Knudsen 10405* from Cactus Flats, San Bernardino N F, San Bernardino Mts, San Bernardino Co. [holotype at ASU; topotype at PRM-Knudsen]. It also occurs in AZ & Nev. so **it is not a CA endemic**.

Verrucaria carbonusta Breuss - CNALH lists one collection of this species: *O. Breuss 29.830*, on vertical rock face, Hwy 140 bridge over Merced River near Old El Portal, Yosemite N.P., Mariposa Co. [YM, lacking type status designation]. **This is a CA endemic**.

Verrucaria subdivisa Breuss - CNALH includes 86 CA collections. The type is *W. Weber & R. Santesson* s.n. from San Clemente Isl. [COLO]. It also occurs in Baja California, Mexico, so **it is not a CA endemic**.

Verrucaria submuralis Nyl. - CNALH includes three CA collections [two different] [F, MICH] of this species. It also has been collected in Tenn., Ill., NY, & PA. **It is not a CA endemic**. Syn.: *V. integrella*

Wahlenbergiella striatula (Wahlenb.) Gueidan & Thüs - CNALH lists ten CA collections. The type is *A. Herre 887*, on rocks just above the sea, Point Lobos, San Francisco [F]. It has been collected widely, including Maine, Brit. Col., New Brunswick, & Europe, so **it is not a CA endemic**. Syn.: *Verrucaria melas* Herre

Wahlenbergiella tavaresiae (R. L. Moe) Gueidan - The type may be the earliest collection, *S. Sparling 2172*, San Luis Obispo Co. [SBBG]. CNALH includes seven CA collections [three different locations] of this species. **It is not a CA endemic** because of a Wash. collection (*S. Tucker 8335*) from Jefferson Co., Wash. [LSU, SBBG]. Syn.:

Verrucaria tavaresiae R. L. Moe

Waynea californica Moberg - CNALH lists 96 CA collections. The type is *R. Moberg 6849a*, on *Quercus* trunk, along Hwy 1 just NW of Big Sur, Monterey Co. [UPS, lacking type status designation]. This species is also found in OR & Wash. so **it is not a CA endemic**. Misapplied names: *Waynea stochadiana*

Xanthoparmelia californica Hale - CNALH lists nine CA collections. The type is *E. Schmidt 464*, entrance to Folsom prison, Folsom, Sacramento Co. [holotype at US]. It is also in AZ, S CA. & Sonora, Mexico, so **it is not a CA endemic**.

Xanthoparmelia schmidtii Hale - CNALH has 19 CA collections, but ~ 10 are by Hale from Tulare Co. The type is *M. Hale 57087*, on M-296 Rd, ~ 4 mi W of junction of M-296 & J-27, rd to Visalia, Tulare Co. [holotype at US; duplicate at DUKE lacking type status designation]. **This species is not a CA endemic**, because it has also been collected in AZ.

Xylopsora canopeorum Timdal, Reese Naesborg & Bendiksby - CNALH has one CA collection. The type is by *R. Reese Naesborg 1544*, 75 mi E of North Escape Rd, Big Basin Redwoods S P [NY, lacking type status designation]. This species grows in the crowns of *Sequoia sempervirens*, & **it is a CA endemic**.

Zahlbrucknerella calcarea (Herre) Herre - CNALH has one CA collection (three duplicates). The type is *A. W. Herre 1287*, summit of Black Mtn, Santa Clara Co. [lectotypes at F & NEB; UC, lacking type status designation]. Other collections are from Colo. (R. Anderson & W. Weber collections), Wash. & Austria. **This is not a CA endemic**.

Zahlbrucknerella californica Henssen - CNALH has no CA collections. The type, *A. Henssen 13627b*, was on volcanic rock in a dry stream bed, Pine Ridge Summit, Coast Range, Humboldt Co.. Location of the type specimen is presumably in Henssen's collection. **This is a CA endemic.**

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***Acarospora sinopica*: an art and research project**

Zahra Jajarmikhayat

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This conceptual art piece is a metaphoric representation of the lichen, *Acarospora sinopica*, which is found on rocks with high iron content. I created the final piece out of metal to provide a structure on which metallophytic lichens would potentially grow. These lichens are likely rare due to the accelerated rate by which metals have been extracted from the Earth for industrial operations and constructions. One of the sites where metallophyte lichens are found are historic mines in which metals such as iron, copper, zinc, etc. were part of the natural resources of the land. These sites are considered natural conservation habitats due to the vivid presence of metallophytic lichens and the necessity of their protection.

The first location in which I installed the sculpture is on the metal bridge that connects the parking lot to the Rodeo beach in the Marin Headlands (Marin County, California). I found many other types of lichen on this bridge which could be a positive indicator of future lichen growth on the sculpture. The rust present on the piece is a metaphorical reference to *Acarospora sinopica* since the lichen itself is visually similar to rust on iron.

In the near future I propose to install this piece in the Iron Mountain mine near Redding, CA to raise awareness of the environmental damage that this mine caused during its peak activities from 1879 to 1963. This damage included fish die-offs in the Sacramento River and vegetation loss from over 100 square miles. Acid mine water created sediment deposits in Keswick reservoir, which is upstream of a drinking water

source for the city of Redding. In 1983, the site was one of the first listed on the U.S. Environmental Protection Agency's National Priority List as part of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or "Superfund"). It was ranked as the third most hazardous site in the state of California (Sickles, 2014).

Through this conceptual work I aim to create an invisible bridge between anthropocentric industrial destruction and the power of biological decomposition of matter through the perspective of lichens. I believe that raising awareness of hidden organisms such as lichens could lead to significant changes in our perspective about nature and about how we engage with natural world around us.

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BIOGRAPHY

I am a photographer and designer based in San Francisco. My work combines elements of science, nature and studies of form. I experiment with materials and concepts unfamiliar to my practice in order to discover new modes of interpreting fragments of nature as an infinite source of curiosity and knowledge. Engagement from both a scientific and artistic point of view provides me with opportunities to gain profound understanding of matter and its surrounding ecosystem.

www.sahrajajarmikhayat.com

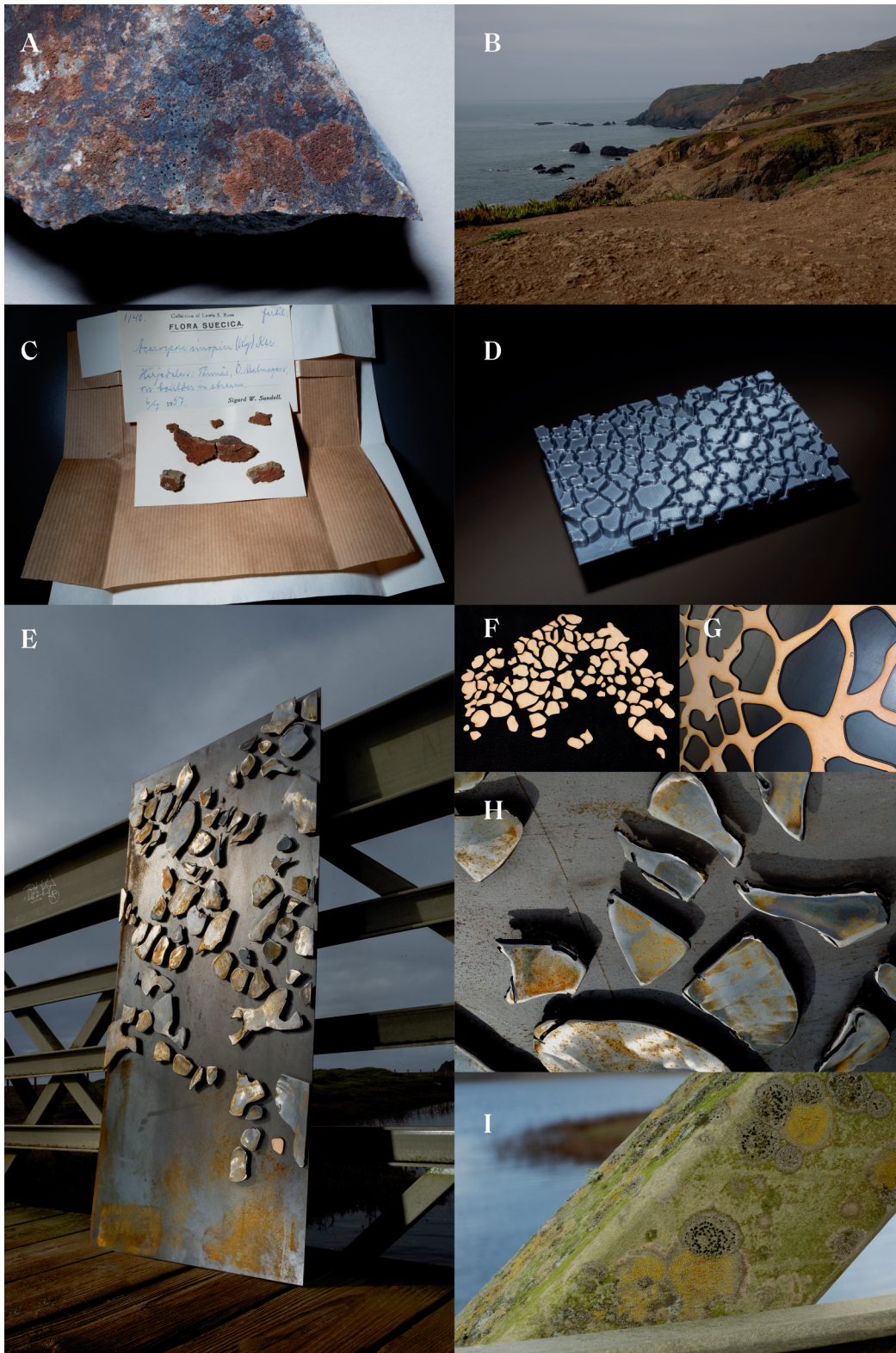


Figure 2. A. *Acarospora sinopica*, image from archives of the herbarium in the California Academy of Sciences, San Francisco. B. Rodeo Beach, Headlands, CA, the site where the sculpture has been installed. C. Archive image of *Acarospora sinopica*, from archives of the herbarium in the California Academy of Science, San Francisco. D. 3D print of the patterns of the lichen. This model was rescaled and rebuilt to make the first prototype in wood. E. The final installation in the Headlands. The presence of rust on the metal, references to the speculative aspect of the project which proposes the future lichen growth on the surface of metal. F-G. Laser cut lichen map part of the development of the project. H. Detail of the rust on each piece of the map. I. Lichens present on the bridge where the piece is installed, indicating the potential for other types of lichen growth.

Noteworthy collection: *Ramalina menziesii* Taylor (Ramalinaceae). – Santa Barbara Co., California, United States of America.

C. Matt Guilliams¹, Jaia M. Guilliams and Malaya J. Guilliams

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PREVIOUS KNOWLEDGE

Ramalina menziesii Taylor (Ramalinaceae), or lace lichen, has been documented primarily in coastal areas along the Pacific Coast of North America, from southeastern Alaska, United States, to near the southern tip of Baja California Sur, México (Rundel 1974, Sork and Werth 2014). Although spanning a wide latitudinal gradient, its regional distribution is patchy, especially on the mainland from Point Conception to the south (GBIF.org, 2022).

Ramalina menziesii is common in coastal Santa Barbara County north of Point Conception and the crest of the Santa Ynez Mountains, yet has seldom been documented in the county south of the crest between Point Conception and the city of Carpinteria. A small number of historical collections exist that may be attributed to this area, but most are quite old and with imprecise locality information (e.g., C.C. Kingman 875, 876, 880, all collected in 1910). Owing to a lack of recent observations, the species was believed by some to have been extirpated in this area (SBBG and Tucker, 2015) prior to a 2015 collection by L. Tucker (s.n.). SBBG and Tucker (2015) speculated that local populations of *R. menziesii* may have been destroyed as the city of Santa Barbara expanded and/or that air pollution might be responsible for the decline and extirpation of *R. menziesii* south of the Santa Ynez Mountains. Air pollution has been documented to have a deleterious effect on *R. menziesii* in the nearby Los Angeles Basin (Boonpragob and Nash 1991). For this reason, a recent collection by L. Tucker was celebrated by

SBBG and Tucker (2015) as an important rediscovery of the species in this region.

SIGNIFICANCE

Here we document a number of recent, previously unvouchered occurrences of *R. menziesii* in Santa Barbara County south of the Santa Ynez Mountains. Our first observation was made in a well-traveled city of Santa Barbara Open Space Park (Douglas Family Preserve) on 20 Jan 2020 using iNaturalist (observation number: 37793161). Further exploration of existing digital records on iNaturalist revealed other recent observations of *R. menziesii* in the Isla Vista/Goleta area (e.g., observation numbers: 13667647, 24873682). On 17 Mar 2020 we revisited and formally vouchered specimens from our first observation, and on 19 Mar 2020 we located and vouchered specimens from populations documented by other recent iNaturalist observations. Two Additional observations were made in 2021. In



This observation of *Ramalina menziesii* on iNaturalist prompted further investigation of the species in the Isla Vista / Goleta area. Photo by Björn Sothman.

total, we generated 5 new iNaturalist observations (observation numbers: 40142270, 40142316, 71243445, 73693474, 73693536) and 2 new herbarium specimens (Guilliams 5728, Guilliams 5729) from the Douglas Family Preserve and 7 new iNaturalist observations (40250068, 40250079, 40250095, 40250791, 40255334, 102660828) and 2 new herbarium specimens (Guilliams 5730, Guilliams 5731) from the Isla Vista/Goleta area. *Ramalina menziesii* was scarce in each place we observed it, requiring significant survey effort to locate isolated single individuals or small patches.

These collections are significant in documenting *R. menziesii* in a region where the taxon was thought to have been extirpated. Furthermore, these collections highlight the utility of the community science platform, iNaturalist, which in this case was helpful for documenting our first observation of *R. menziesii* and pointed us toward two previously unvouchered localities in the Isla Vista/Goleta area. This is consistent with many other findings of complementarity between specimen-based biodiversity documentation and observation-based approaches such as iNaturalist. Finally, it is important to note that the apparent decline and subsequent “rediscovery” of *R. menziesii* at multiple stations south of the Santa Ynez Mountains in Santa Barbara County can also be explained equally well as the detection of rare, low-density populations that went unobserved prior to the wide-spread use of community science based biodiversity platforms like iNaturalist. Evidence for the recovery hypothesis could be gleaned from repeated future visits to determine if the *R. menziesii* individuals that we observed have continued to grow and spread locally.



The authors' first iNaturalist observation (#37793161) of *Ramalina menziesii* in the City of Santa Barbara (left). Jaia and Malaya Guilliams prepare the noteworthy collection (right).

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Learning about resilience from biological soil crusts

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In the beginning, there were cyanobacteria. It is a commonly held thought that cyanobacteria were the first organisms to colonize land. Microscopic organisms moved from the sea to the harsh realities of rock and soil. Having already oxygenated the earth through photosynthesis, the early cyanobacteria then had to cope with the blazing sun and long stretches without water. As the terrestrial cyanobacteria gradually grew accustomed to their new life, they began aggregating the soil particles, stabilizing the soil with the sticky secretions from their cells, called exopolysaccharides, thus forming the first biological soil crusts -- also known as biocrusts.

Biocrusts contain both hardy and delicate communities of microscopic and macroscopic organisms. The diversity of environments where biocrusts thrive and the complex interactions they have with other ecological communities is what makes them an interesting community to study. The past few decades have spurred a plethora of research on biocrust communities around the world and how they recover from disturbance. Across their range, biocrusts are plagued by man-made disturbances like grazing and herbicides and natural disturbances like fire and drought, all made more severe by the effects of climate change. In general, these disturbances alter the community composition of the biocrusts, reduce species richness, and alter ecosystem functions.

The shift in biocrust communities and their recovery can be generalized in a simple successional model. Early successional cyanobacteria-dominated biocrusts, like those formed in the early days of terrestrial life, are still common to-

day in areas with high disturbance. Initially after a disturbance, biocrusts are formed or re-formed by filamentous cyanobacteria, then nitrogen fixing cyanobacteria. After the cyanobacteria colonize and stabilize the soil, this paves the way for lichens.

In North America, there are over 200 lichen species associated with biocrusts across a variety of different habitats. The ability of lichens to survive extreme conditions like desiccation, temperature extremes, and UV stress are valuable traits in a biocrust. Lichen-dominated biocrusts are found on every continent-- in polar regions, hot deserts, temperate grasslands, and high mountains. Lichens add to the high species diversity within biocrusts, add additional ecosystem services like improving soil stability and water infiltration and play key roles in biogeochemical cycling. Some studies suggest lichens inhibit the germination of non-native species, while others suggest that lichen biocrusts facilitate the succession of plant communities by fertilizing and stabilizing the soil. A recent meta-analysis revealed that lichen-dominated biocrusts reduce plant germination, but when a seed is able to germinate the biocrust promotes plant growth. Lichens are generally slower growers than cyanobacteria; when and what types of lichens colonize biocrusts depends on dispersal and the available spores in the area. Bryophytes, including mosses and liverworts, are also late colonizers of biocrusts and can even occur in places as harsh as the Mojave Desert.

My work builds on our understanding of how biocrust communities recover from disturbance

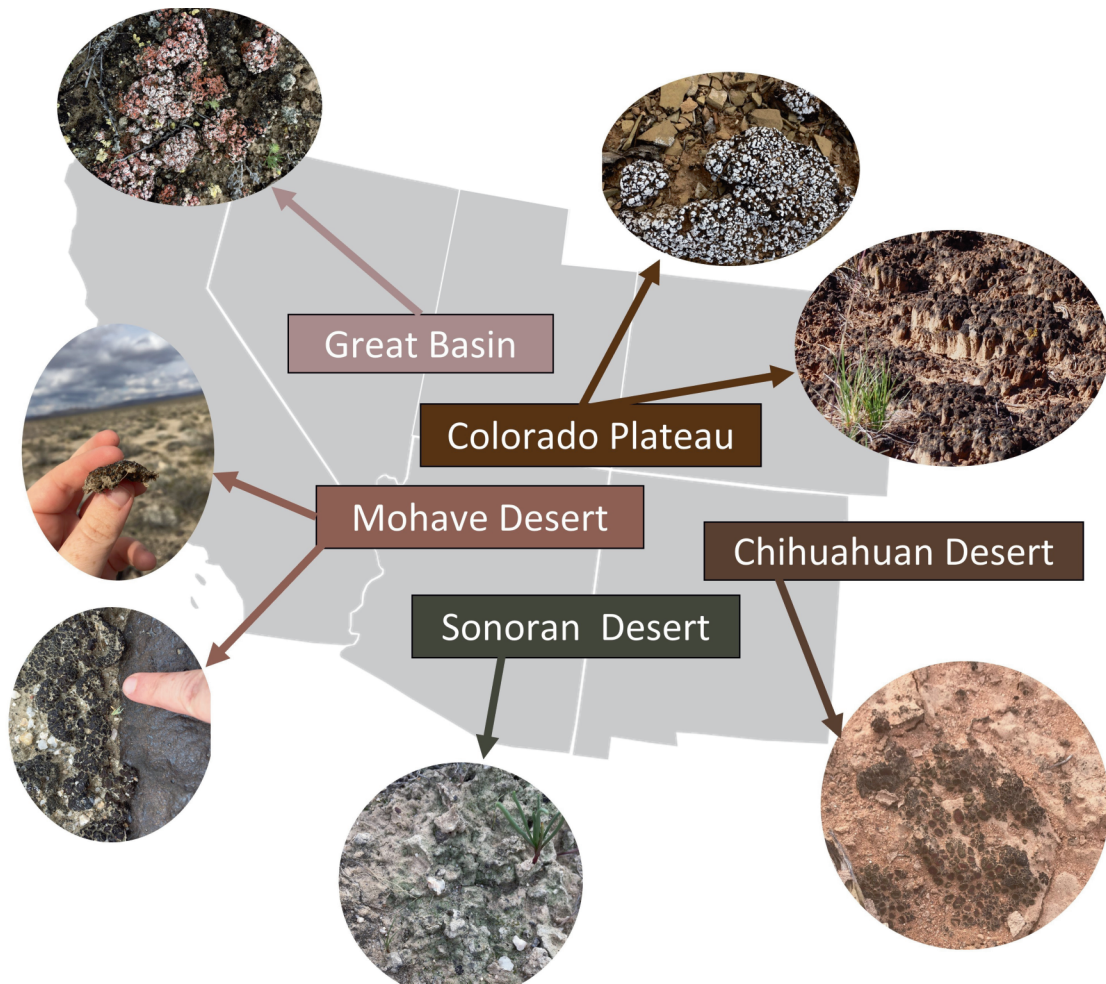


Figure 1. Photos showing the diversity of biocrusts in Western U.S. drylands. Photos by Brianne Palmer.

and the successional trajectory of biocrusts on a microscopic level. Specifically, I want to understand how or if fire changes the overall cover of biocrusts and the community composition.

However, when I began this project there was no consensus on how biocrusts recover from fire. Are they similar to the plant communities they coexist with? Do some thrive after fire while others struggle to recover? To answer this question, I performed a meta-analysis comparing the change in the percent cover of biocrust functional groups before and after fire. First, I scoured the scientific literature for studies that directly compared the percent cover of biocrust,

either before and after a fire or using adjacent burn and control groups. Then, based on the descriptions within the text, I grouped the biocrusts based on the functional group: cyanobacteria/algae, lichen, bryophyte, or mixed. To standardize across the studies, I calculated the effect size, which uses the mean and standard error of each study to create values comparable across different methods. I also included abiotic variables based on available information in the studies including time since fire, fire type, a variety of climate variables, and the LANDFIRE fire regime classification.

Using 20 studies from 1974 to 2019, we found that fire has an overall negative effect on biocrust cover, reducing the overall biocrust cover by 50% (Figure 2). This fits our expectations about biocrust response to fire. Since biocrusts live on the soil surface, they are directly exposed to the heat from the fire and may not be equipped to survive the heat. However, the meta-analysis also revealed a glimmer of hope for biocrust recovery after fire. In some cases, biocrusts are resilient to fire; given enough time, biocrust eventually regain the cover they lost. By including the “time since fire (TSF)” as a variable in our meta-analysis we could see how biocrust cover rebounded. As the time since the fire increased, the percent cover of lichens and bryophytes also increased,

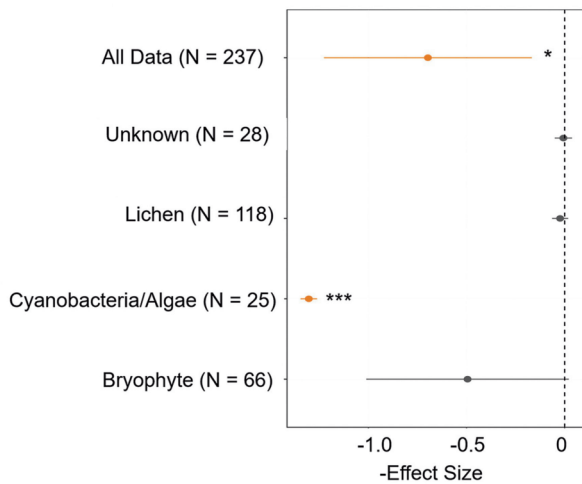


Figure 2. Effect of moderating variables on biocrust resilience. Data in purple indicate the biocrust cover had a significant positive response to fire ($P < 0.05$). Data in orange indicate a significantly negative response to fire. Data in gray indicate no response to fire ($P < 0.05$). The effect size and 95% confidence intervals of all the data and each of the biocrust types. ‘All’ is the total response based on all the data. The dashed line represents an effect size of zero, indicating no difference between the cover of burn and control plots. Asterisks represent significant relationships based on meta-regression modeling (* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$). Reprinted from Figure 4A, Palmer et al. 2020, CC-BY-ND.

and the cover of cyanobacteria and algae dominated biocrusts decreased (Figure 3). This matches the general model of biocrust succession-- the longer the time since disturbance the more time lichens and bryophytes have to colonize the biocrusts and the early successional organisms (cyanobacteria and algae) are less abundant or co-occur with lichens and bryophytes.

Importantly, this study revealed stark differences in biocrust cover response to fire based on the individual studies, making it difficult to make broad statements about biocrust response to fire given the sheer heterogeneity between the experiments. Ecosystem responses to fire are complex, especially at the community level-

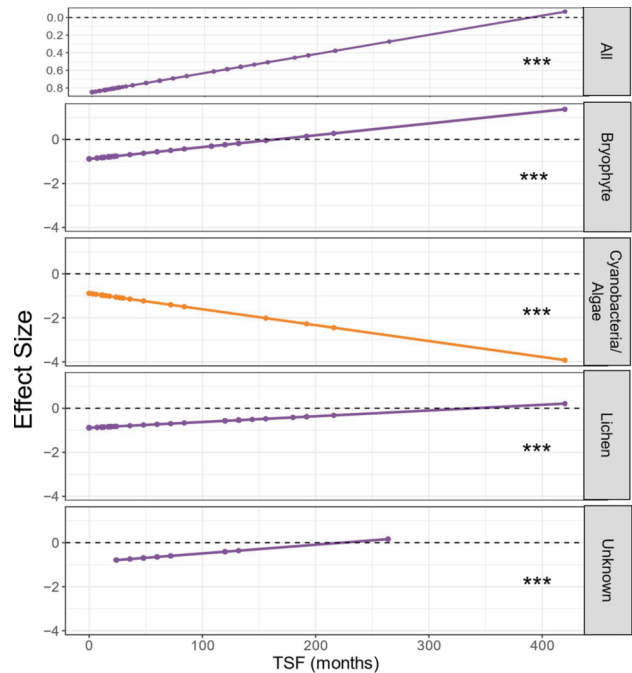


Figure 3. Relationship between biocrust cover and time since fire. Positive (purple) and negative (orange) relationships between time since fire (TSF) in months and the effect size by biocrusts type. Asterisks represent significant relationships based on meta-regression modeling (*** $P < 0.001$). Reprinted from Figure 5, Palmer et al. 2020, CC-BY-ND.

the hundreds of species associated with biocrusts respond to disturbance in their own way depending on the species, the environment, and the type of disturbance. But, biocrusts can also teach us a lesson about resilience and recovery.

When I was composing this meta-analysis, the world was a different place. As I was writing my code and scraping data from the published studies, Australia was experiencing a record fire season in January 2020. By the time I was writing up my results, the world had descended into chaos, all in-person research was put on hold and our entire lives became virtual due to the COVID-19 pandemic. As each wave of disaster descended upon our lives, disrupting basic research functions, and worming its way into our personal lives, I was thinking about resilience.

In ecology, resilience is defined as the ability of an ecosystem to return to its pre-disturbance state. For biocrusts, this might mean gradually increasing cover and reaching the climatic successional communities with lichens and mosses. For us, things might never be the same, but we can gradually return to the activities that bring us joy and bring some normally back into our lives after two years of chaos.

Natural recovery of biocrusts after a disturbance may take months to decades, depending on the environment, the type of disturbance, and the biocrust community. But by developing and implementing new restoration techniques, we can help speed up the recovery of biocrusts and revive the ecosystem functions biocrusts provide. Researchers have brought back biocrusts to degraded landscapes by salvaging biocrust materials from other sites. Some have grown early successional cyanobacteria inoculum and grew new biocrusts in the field. This is the lesson I take from biocrusts--recovery from a distur-

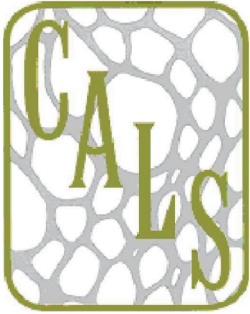
bance is possible especially with a little help. The resulting community might look a bit different than it was before, but eventually key taxa and the ecosystem functions they provide ultimately return and continue to shape the ecosystem.

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Editor's Note: This research was supported by a grant from the California Lichen Society in 2018.



California Lichen Society Grants Program

The California Lichen Society offers small grants to support research pertaining to the lichens of California. No geographical constraints are placed on grantees or their associated institutions, but grantees must be members in good standing of the California Lichen Society. The Grants Committee administers the grants program, with grants awarded to an individual only once during the duration of a project. Grant proposals should be brief and concise.

Grant Applicants should submit a proposal containing the following information:

- Title of the project, applicant's name, address, phone number, email address, and the date submitted.
- Estimated time frame for project.
- Description of the project. Outline the purposes, objectives, hypotheses where appropriate, and methods of data collection and analysis. Highlight aspects of the work that you believe are particularly important and creative. Discuss how the project will advance knowledge of California lichens.
- Description of the final product. We ask you to submit an article to the Bulletin of the California Lichen Society, based on the results of your work.
- Budget. Summarize intended use of funds. If you received or expect to receive other grants or material support, show how these fit into the overall budget. The following list gives examples of the kinds of things for which grant funds may be used if appropriate to the objectives of the project: expendable supplies, transportation, equipment rental or purchase of inexpensive equipment, laboratory services, salaries, and living expenses. CALS does not approve grants for outright purchase of capital equipment or high-end items such as computers, software, machinery, or for clothing.
- Academic status (if any). State whether you are a graduate student or an undergraduate student. CALS grants are also available to non-students conducting research on California lichens. CALS grants are available to individuals only and will not be issued to institutions.
- Two letters of support from sponsors, academic supervisors, major professors, professional associates or colleagues should be part of your application. These should be submitted directly from the author to the committee Chair.
- Your signature, as the person performing the project and the one responsible for dispersing the funds. All of the information related to your application may be submitted electronically.

Review: Members of the Grants Committee conduct anonymous evaluation of grant proposals once a year based on completeness, technical quality, consistency with CALS goals, intended use of funds, and likelihood of completion. Grant proposals received by November 1 each year will be considered for that year's grant cycle. The Grants Committee brings its recommendations for funding to the Board of Directors of the California Lichen Society, which has final say regarding approval or denial.

Grant Amounts: CALS typically offers two grants of \$750.00 and \$1000.00 each year. Typically grants are awarded to two separate individuals, however depending on the quality of the applications and the amount of funding available, the committee maintains the option to disburse funds as appropriate. All grants are partially dependent on member contributions, therefore the amounts of these awards may vary from year to year.

Obligations of recipients: 1) Acknowledge the California Lichen Society in any reports, publications, or other products resulting from the work supported by CALS. 2) Submit an article to the Bulletin of the California Lichen Society. 3) Submit any relevant rare lichen data to California Natural Diversity Data Base using NDDDB's field survey forms. See <http://californialichens.org/conservation> for additional information.

How to submit an application: Please email submissions or questions to the committee Chair at grants@californialichens.org by **November 1, 2022**. The current Chair is Rikke Reese Næsborg.

News and Notes

UC JEPSON HERBARIUM WORKSHOP: A BIG WORLD IN A SMALL PACKAGE- LICHEN BIOLOGY, IDENTIFICATION, AND CONSERVATION

October 1, 2022 1:00 - 5:00pm

This workshop will serve as an introduction to lichens. What is a lichen? Where can we find them? How can we identify them? Workshop participants will learn to distinguish lichens from other potentially co-occurring organisms including mosses, liverworts and non-lichenized fungi. We will cover the main morphological groups of lichens, and participants will learn to distinguish fruiting bodies and other features associated with keying out lichens. After running through some examples of keying out lichens, with a focus on California species, participants will then learn about the biology of lichens, where they can be found, what they are doing within the environment, and what we can learn from different patterns of lichens that we see. In the final section of the workshop, we will dive back into the knowns and unknowns of the lichen symbiosis itself, and we will discuss the importance of lichen conservation. By the end of the workshop, participants will have an understanding of what a lichen is and how to identify it, the role of lichens in the environment, and why it is important to protect lichens for generations to come. Please register in advance through the Jepson Herbarium website: <https://ucjeps.berkeley.edu/workshops/> Led by: Klara Scharnagl. Course Fee: \$25

EAGLE HILL INSTITUTE'S 2022 LICHENOLOGY AND RELATED SEMINARS

Eagle Hill is right on the coast of Eastern Maine, between Acadia National Park and Petit Manan National Wildlife Refuge. For general information, the registration form, seminar flyers, and a complete calendar, see: <https://>

eaglehill.us/programs/sems-weeklong/calendar-weeklong.shtml. *Please note that proof of full COVID-19 vaccination (including booster) is required for acceptance into our seminars. If you have any questions about the content of the seminar, please reach out to the seminar instructor(s), whose contact info can be found on the seminar flyer. If a seminar you are interested in is full, and you would like to be put on the waitlist, please fill out the application form. If you have any questions about registering for the seminar, please contact us at office@eaglehill.us.

Introductions to Lichens - August 14-20. This introductory level seminar is designed primarily for undergraduates in the biological sciences, people involved in natural history inventory work and interpretation, and for teachers or anyone whose appreciation of the outdoors has ever excited their curiosity about these attractive and intriguing organisms. The basic structure, life history, ecology, and classification of lichens will be covered in formal lectures and discussions. The goal of the seminar is to provide participants with the confidence, basic knowledge, and skill to pursue further study of lichens on their own. No prior experience in identifying lichens is assumed, although familiarity with basic microscope technique would be most helpful. Led by Fred Olday (folday@gmail.com).

SAN MATEO COUNTY BIOBLITZ

The BioBlitz on Saturday April 30th, 2022 at Devil's Slide Trail in coastal San Mateo county was a great success. Julene and Jennifer represented CALS, and induced some newcomers into the micro-world of lichens. In the words of one enthusiastic participant "OMG! I will never not notice lichens again!"



Lichens from Devil's Slide BioBlitz. *Heterodermia leucomelos* (top) by Leslie Flint and *Ramalina pollinaria* (bottom) by Julene Johnson.

Our success can be measured by the fact that two of the top six species were lichens - *Niebla homalea* and *Acarospora socialis* - and at least another 15 species were seen, including *Niebla combeoides*, *Usnea rubicunda*, *Teloschistes flavicans*, and *Ramalina pollinaria*. We also introduced people to the great work of CALS by wearing our CALS lichen swag and sharing our sightings of *Ramalina menziesii*.

Join us for our next co-sponsored BioBlitz in San Mateo county, June 25, 2022 at the Cowell-Purisima Coastal Trail. More rocks and old fence lines to delight the symbiotically-attuned!

If you are on iNaturalist, please try your hand at identifying more of the lichens spotted during 2022's City Nature Challenge sweep in the Bay Area. <https://www.inaturalist.org/projects/2022-devil-s-slide-trail-bioblitz>

Jennifer Rycenga



If Ken had a hammer, he'd hammer at the *Caloplaca*.

CALS FORAY - SUGARLOAF RIDGE STATE PARK

The foray at Sugarloaf Ridge State Park on April 16th, 2022 was great fun. Check out the iNaturalist project (<https://www.inaturalist.org/projects/cals-lichen-foray-sugarloaf-ridge-april-2022>) for a growing list of species. Here are a few representative pictures from the weekend.

Jennifer Rycenga



Sugarloaf Ridge State Park



The assembled multitude listen to Ken from the other side of the stream.



Jumping spider examining the finer details of crustose lichens on rock

THE PLURAL OF LICHEN IS LICHENS

One of the first things I tell my students of lichenology is that the plural of lichen is lichens. That might sound like a trivial thing to emphasize, but hear me out.

The vast majority of people, walking in the forest, don't have a preferred plural for lichens because they simply won't notice the lichens at all. Lichens are invisible to them, blending into the colors of the landscape. People who love nature, or perhaps spend a lot of time in rocky

deserts or boreal forests, will notice lichens, but they most often use the word lichen as a mass noun--as in, "the cedars are festooned with lichen" (the example sentence that comes up when lichen is typed into Google). And then there are lichenologists. Anyone who has spent considerable time learning about or studying lichens acquires new language to speak and write about them--fruticose, foliose, apothecia, and rhizine are just a few of the terms that are bound to come up in any first lesson on lichen anatomy. But in my experience the most important linguistic change for new lichenologists is a less conscious one: the tendency to refer to "lichens" and not "lichen." The trees are no longer "festooned with lichen" but rather "there are so many lichens in the forest!"

Using the plural "lichens" is not a rule typically taught to new students of lichenology. It's not grammatically or biologically incorrect to refer to the trees festooned with lichen or even to say you love lichen, rather than you love lichens. Using the plural lichens is not an indicator of knowledge, at least not directly. Certainly some lichenologists continue to use lichen in these contexts and they are not wrong.

No, using the plural "lichens" is simply what happens when you start to see lichens as individuals rather than undifferentiated biomass. Mass nouns refer to things that can't be counted. When you start picking up branches and counting the lichens--bright yellow *Xanthoria*, climbing over itself, fruiting bodies like dark orange buttons, elegant *Parmotrema*, smooth and pale blue on top, dark hairs peeking out from the edges, tiny *Candelaria* glowing in lemon-lime, tufty *Usnea*, just waiting to be carried to a bird's nest- the word lichen naturally gains its "s".

When I teach new lichenologists, I like to share this observation early on, to welcome them to the club and kick off their journey to seeing lichens in a new way, as individuals that they can count and name and appreciate in their great diversity.

I'm sure lichenologists are not alone in this. Most likely grass experts groan when no one appreciates the many different grasses.

But there's something a bit unusual about learning to see lichens in particular as individuals, because lichens most often get attention for, well, not being individuals at all. The classic definition of a lichen is a composite organism, made up of a fungus and a photosynthesizing partner, an alga or cyanobacteria, living together in a mutually beneficial symbiosis. Lichen research over the past decade has added to this definition, with the discovery of yeasts and other fungi in the outermost layer of some lichens turning the partnership into a triad in 2016, and a quartet in 2019. Adding in the numerous other fungi and bacteria and animals found in smaller proportions within and on lichens, the whole thing is best understood as a tiny community.

The most common use of the lichen as a metaphor is unsurprisingly based around this happy symbiosis. Lichens are about getting along, getting a cup of sugar from your neighbor, the give and take of love, voices in a choir coming together in harmony. A real communal vibe. Community is what lichens are all about.

At first, it can feel like there's something almost contradictory in thinking about lichens as individuals rather than communities. We are accustomed to thinking about tensions between the individual and the community. Political and economic texts, schools of thought, entire

nations have been built around this tension. They feel like opposites.

But here's the thing about lichens, and so many other things: their individuality would not exist without the community within. Scientists have struggled to recreate lichens in the lab for a long time. The three-dimensional forms, the pigments, the hundreds of metabolites--there always seems to be some essential missing piece. The puzzle has not been solved, at least not yet, but recent evidence suggests that the newly discovered yeasts may be the key to making many of the compounds that give lichens their colors and shapes and textures.

It turns out that the very features that allow a new lichenologist to distinguish ten lichens on a branch, to point to *Xanthoria* and *Parmotrema* and *Usnea* and *Candelaria* and all the rest, are directly the result of the community inside.

In lichens, there is no tension between individual and community. They are simply two ways of looking at the exact same thing. And this truth occurs over and over, with community-as-individual nested inside community as-individual, on and on like Russian Dolls, individual lichens forming communities on tree branches, lichen covered trees forming a community in the forest, forests grouping together in biomes and so forth.

This is perhaps just a sciency, overwrought way of saying something really obvious: individuals are the sum of their parts. But even obvious things can be easy to forget, and sometimes it takes a lichen to remember that individuality and community aren't really opposites at all.

Allie Weill

President's Message

Dear California Lichen Society members –

I am very excited to be the new California Lichen Society President. As a long-time student of California lichens, I look forward to helping California lichen lovers build a stronger community. I would like to thank **Tom Carlberg**, the departing President, for his excellent leadership over the last several years. Tom is one of California's most skilled lichenologists and he has been very generous with his time and energy, to all of our benefit. Tom leaves big shoes to fill, but remains engaged in CALS leadership as a board member.

The pandemic has been a challenging time for CALS, and the organization largely went dormant, like inland lichens during the dry season. I am very grateful to **Jes Coyle** and **Justin Shaffer** for their hard work keeping the CALS Bulletin in publication during this time, which helped CALS members stay engaged while in-person events were paused. In other outreach efforts, **Allie Weill** and **Mary Ann King** have designed and produced a new line of CALS merchandise based on a beautiful lace lichen design (available at bonfire.com/store/cals). Additionally, **Lishka Arata** and **Sara Conway** have started a CALS Instagram account that has already engaged hundreds of followers. It's great to see how much enthusiasm these efforts draw from the broader community.

Although the pandemic is not over, we know more about how to live with COVID now, and it is exciting to be returning to in-person events in 2022. Getting together in person is critical for maintaining our community and mentoring the next generation of lichenologists. To that end,

we held a very successful annual meeting on March 19 in Arcata, following the Northwest Lichenologists meeting March 17-18, with an estimated attendance of about 50 people. This was a rare opportunity for lichenologists from all over the West to gather, and we held some excellent fieldtrips in the diverse ecosystems of Humboldt County. We were happy to welcome **Klara Scharnagl**, UC Berkeley's new lichen curator, into our community, and she gave a compelling evening presentation. Stay tuned for a full writeup of the meeting in our summer issue.

In the year (and years) ahead, I would like to see CALS hold more frequent events, expand our outreach efforts in the broader community, and find sources of additional funding to provide a greater number of research grants. Events could include forays to interesting lichen communities around the state as well as online events such as zoom lectures on lichen topics. Currently, we are not able to fund all of the high-quality grant proposals we receive. Small grants to support student research are one of the most efficacious ways to increase our understanding of California lichens and bring the next generation of into the nefarious world of California lichenology.

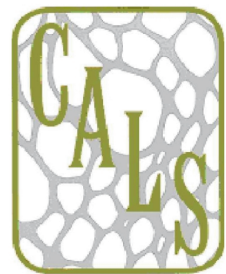
What would you like to see California Lichen Society do now that we are emerging from the pandemic torpor? I hope to recruit other lichen enthusiasts to help make the Society more active in the year ahead. There are many opportunities for volunteers to make impactful contributions to our organization--we could use help with social media, outreach events, fundraising, website maintenance, member engagement, and more. I would love to hear from anyone who is interested in in getting

more involved—no previous lichen experience is needed.

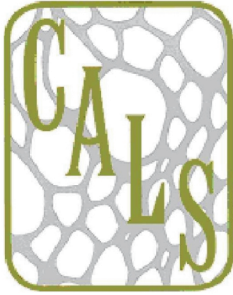
It is an interesting time to be a naturalist and a lichenologist. Biodiversity faces unprecedented threats, and we are experiencing extreme climate events and severe wildfires. But there is also growing awareness and interest in biodiversity among the general public—even for cryptic organisms like lichens. Our basic understanding of what lichens are has grown enormously in less than a decade, and we now recognize that lichens may contain more than one obligate fungal symbiont. Meanwhile, the field of natural history is engaging with social and environmental justice movements and reexamining its colonialist origins and assumptions. There is increasing recognition that Indigenous management practices have shaped many of the “wild” landscapes around

us, and that continuing management such as prescribed fire may be needed to maintain biodiversity in many ecosystems. How do California lichens fit into these broader trends and conversations? I look forward to exploring this question with all of you.

Symbiotically yours,
Jesse



Jesse Miller (right) and Tom Carlberg (left), the most recent CALS presidents.



CALIFORNIA LICHEN SOCIETY

PO Box 472, FAIRFAX, CALIFORNIA 94978

The California Lichen Society (CAL S) seeks to promote the appreciation, conservation, and study of lichens. The interests of the Society include the entire western part of the continent, although the focus is on California.

Members receive the Bulletin of the California Lichen Society (print and/or online access), voter rights in society elections, access to the CAL S community, and notices of meetings, field trips, lectures, and workshops.

Membership Dues (in \$US per year)

Student and fixed income (online eBulletin only) - \$10
Regular - \$20 (\$25 for foreign members)
Family - \$25
Sponsor and Libraries - \$35
Donor - \$50
Benefactor - \$100
Life Members - \$500 (one time)

Membership dues can be made payable to:
California Lichen Society, PO Box 472, Fairfax, California 94978

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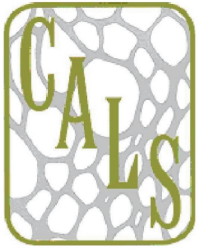
To join or renew online, please visit www.californialichens.org/membership

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What do these lichens have in common?



Lecanora mellea



Sigdridea californica



Polyscaenia pollinarioides



Acarospora obvallens

Find out inside this issue on pg. 28!

Photos by Ken Kellman.