

Rare lichens collected in California by Judith (Judy) and Ron Robertson

Shirley Tucker

Santa Barbara Botanic Garden, 1212 Mission Canyon Rd, Santa Barbara, CA 93105; and Cheadle Center for Biodiversity (CCBER), University of California, Santa Barbara, CA 93106

Email: tucker@lifesci.ucsb.edu

Abstract. Judy and Ron Robertson were outstanding amateur lichenologists in California. Their huge lichen collection (over 8,500 collections) was donated to the University of California Herbarium after their deaths. This article describes 36 unusual lichens that they collected in California, together with their provenance, many of them extremely rare or new to the California flora.

Keywords. California, UC Herbarium, lichens, Robertson.

INTRODUCTION

Lichenology in California has typically been conducted by visiting scientists and by amateur collectors. The only professional lichenologist who has been employed by any of the CA universities or museums is William P. Jordan, who was at the University of San Francisco in 1978. Mycologists such as Harry Thiers (SFSU), Lee Bonar (UC) and Isabelle Tavares (UC) collected lichens, taught classes, and donated to herbaria. The lichen flora in California is large and diverse, with a total of 1,870 species recorded for the state (Tucker 2014). The Lichen Consortium (<http://lichenportal.org/portal/collections/index.php>) records 139,258 lichen collections from California from 81 reporting institutions in North America and Europe.

Two outstanding recent lichen collectors and amateur lichenologists in California were Judy and Ron Robertson, active and capable lichenologists. They lived in Sonoma, NE of the Bay Area. Judy was a hospital technician and Ron taught biology in Sonoma schools. Judy was active in the California Lichen Society for many years, both as an officer and in organizing the field trips for members, which were such a source of pleasure and edification. Ron was also an expert on Lepidoptera and bryophytes, and donated substantially to the UC collections. On field trips, Ron and Judy always managed to walk farther, climb higher than the rest of us, and often found unusual species. They published many articles on lichen field trips (Doell et al. 1999; J. Robertson 2002, 2003, 2004, 2005a, 2005b; J. Robertson and Beyer 2005; Robertson and Robertson 2001, 2002). Judy assisted in the UC lichen workshop at Bodega Bay led by I. Brodo in 2010, only a few months before her death of cancer at age 64 on July 10, 2010 (Carlberg 2010). Ron had died at age 63, also of cancer, January 27, 2009. Their huge lichen & bryophyte collections were given by the two Robertson daughters to the University of California herbarium at Berkeley (University of California), substantially increasing the lichen collection there. Thanks to the active staff at UC, records of the Robertson collections are appearing on the Consortium of North American Lichen Herbaria website (CNALH), so that everyone can see what a remarkable array of lichens was found in California by the Robertsons. The Consortium allows one to see what species have been collected in the state, as well as the collector's name, location and date of the collection. It also indicates the herbarium in which the collection is deposited; most of the Robertson collections are at UC, but others are at various other institutions*. CNALH lists 8,541 collections in California by the Robertsons, although that total is expected to rise as more specimens are data-based. Many Robertson collections are the only ones known from CA; others are among a small number of CA collections. Most of these cited here have been verified by this author or by specialists. A few relevant collections by other collectors are mentioned, as well as sources showing photographs of some species. Brief descriptions are included for species lacking photographs. It should be noted that there may be additional CA collections of these rare species that are unreported because they are held privately or in institutions not yet contributing to

CNALH. Yosemite collections are mentioned because many collections resulting from the Yosemite National Park foray (Hutten et al. 2013) are not recorded in CNALH. Hutten refers to some collections on site (YOSE).

For complete literature references about the species listed here in California, refer to the California lichen catalogue (Tucker 2014). Some of these rare finds have been brought together in the following list, illustrating the remarkable collecting skills of Ron and Judy Robertson.

The accompanying photographs by Steve Sharnoff illustrate some of the species described. They were not taken of the Robertson collections. Reviews by B. McCune and I. Brodo were helpful and much appreciated.

RESULTS AND DISCUSSION

Amandinea conioeps (Wahlenb.) Th. Fr. (Marin Co.: *J. & R. Robertson 6813*, Pt. Reyes lighthouse [UC]) Note: There is only one California collection of this species in CNALH; others are from Alaska and Europe. It is a lichenized brownish crust with a trebouxioid photobiont, blackish disk, and 1-septate brown spores, growing on rock.

Anaptychia crinalis (Schaerer) Vezda (Robertson and Robertson 2002; *J. & R. Robertson 5702*, rocky headlands along Hwy 1, Mt. Tamalpais State Park, Marin Co., confirmed by T. Esslinger [UC]) Note: There is a photograph in Brodo et al. (2001, p. 161, under the synonym, *A. setifera*). Only five known California collections of this species are in CNALH (three by the Robertsons at Mt. Tamalpais [TLE, UC]); one other collection is by J. Thomson in San Mateo Co. [WIS], and another as *A. setifera* by Castelnau in CA in the 1880's [US], confirmed by B. McCune. Most North American collections are from Minnesota, Michigan, New England and Canada.

Buellia papillata (Sommerf.) Tuck. (Fink 1935; Robertson 2003, citing Mono Co.: *J. Robertson 7021*, *S. Tucker 37975*, *37977*, Bristlecone Pine forest, White Mountains Research Station, Crooked Creek Facility [SBBG, UC]) Syn.: *Tetramelas papillatus* (Sommerf.) Kalb Note: CNALH lists seven CA collections [four different collectors and locations] of this alpine species, but it is common in interior western U S as well as Oregon, Washington, British Columbia and Alaska. The Robertson collection is K-, while Smith et al. (2009) says it is K+ pale yellow, and the Brodo key says K+ yellow. Spores are 1 (rarely 3-septate) in the Robertson collection (and implied in the generic description in Smith et al. 2009), 1-septate in the Brodo key, and 3-septate in Fink (1935). Spore size in the Robertson collection is 21-28 x 10-11 µm, fitting within the ranges given in various references.

Calicium lenticulare Ach. (Goward 1999; Robertson 2002a; Rikkinen 2003; Williams and Sillett 2007; Robertson 2002; Hutten et al. 2013, for Yosemite National Park, citing *Hutten 14025* (not in CNALH); Mendocino Co.: *J. & R. Robertson 6731*, *6732*, *6735*, *6760*, *6376*, *6740*, Van Damme State Park near Pygmy Forest [UC]) Note: Ten CA collections of this pin lichen are cited in CNALH, including six Robertson collections from one location [UC], three by R. Naesborg from Armstrong Redwoods State Natural Reserve, Sonoma Co. [UC], and one collection, *E. Imamura 25*, from Del Norte Co. [SFSU]. Rikkinen (2003) cited a collection from Del Norte Co., held at Helsinki (H, not in CNALH).

Calicium quercinum Pers. (Marin Co.: *J. Robertson 8887*, Mt. Tamalpais State Park [UC]) Note: This is the only California collection of this pin lichen in CNALH; it is known from one collection in OR where it is on the threatened and endangered list, and one from Washington (not in CNALH; information fide B. McCune). Other U S collections of this species from the midwest & Mass. may be misidentified, fide McCune.

Caloplaca parviloba Wetm. (Mono Co.: *J. Robertson 9207*, arctic-alpine rock outcrop, UC White Mountains Research Station, above Patriarch Grove on road to Barcroft Gate [UC]).

J. Robertson identified this collection as *Caloplaca tominii*, but the Robertson specimen lacks soredia diagnostic for that species. Rather, the areoles have tiny marginal lobules, as described by Wetmore (2003) for *C. parviloba*. CNALH includes only two CA collections of *C. parviloba*, from Riverside and Santa Barbara counties.

Caloplaca jungermanniae (Vahl.) Th. Fr. (Wetmore 1985; Robertson and Beyer 2005; McCune and Rosentreter 2007; Siskiyou Co.: *B. Ryan 25284*, Marble Mtn Wilderness, 1.6 km along Shackleford Creek [ASU]; Tuolumne Co.: *S. Shushan S 14583*, Saddlebag Lake [COLO, UC]; Modoc Co.: *J. Robertson 8900 b*, Soldier Creek [SBBG, UC]) (Fig. 1). Syn.: *Bryoplaca jungermanniae* (Vahl) Søchting, Frödén & Arup. Note: CNALH includes only six California collections of this high-elevation species.

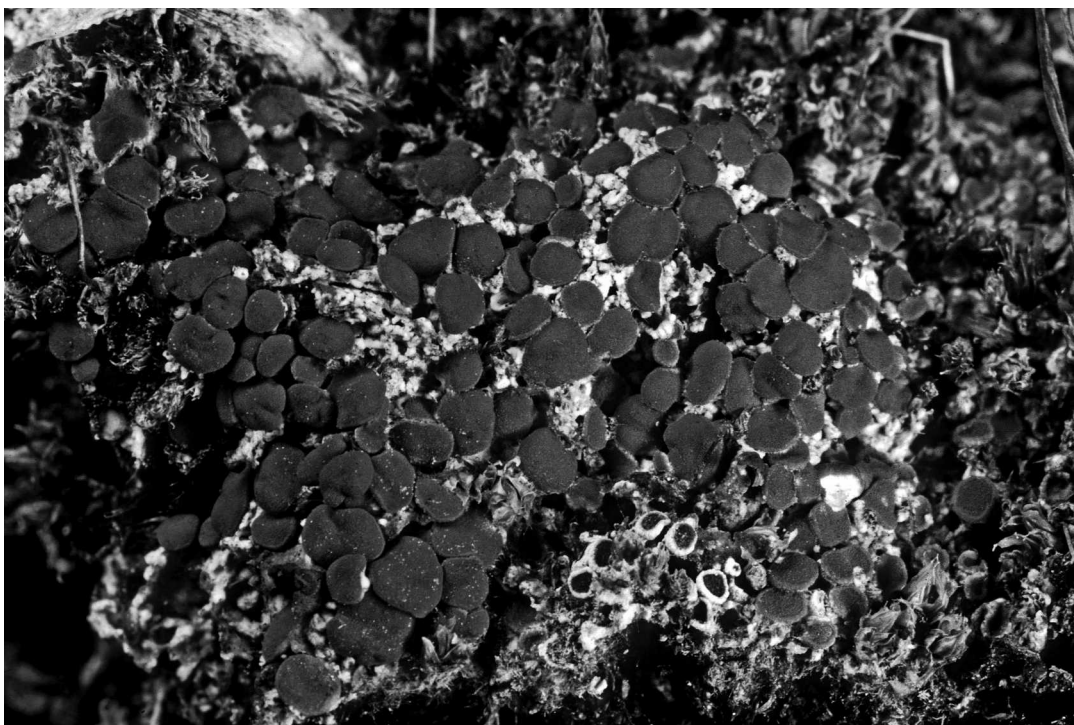


Figure 1. *Caloplaca jungermanniae* (Vahl.) Th. Fr. Photograph by Stephen Sharnoff (no. 1436.18, from Alaska).

Calvitimela aglaea (Sommerf.) Hafellner (Hutten et al. 2013, based on an *A. Fryday* collection, Yosemite National Park) Syn.: *Tephromela aglaea* (*J. & R. Robertson 6886*, on serpentine outcrop, Bolinas Fairfax Rd 0.3 mi W of golf course, Mt. Tamalpais State Park, Marin Co. [UC]) Note: This is the only California collection in CNALH. Most other US collections of it are from interior western states and Alaska.

Cetraria aculeata (Schreb.) Fr. (Herre 1944b; Orange Co.: *M. A. Howe*, hills above Ocean View, S of Westminster, 10 Nov 1895, [COLO, FH, MIN, SBBG, UCR]; Marin Co.: *R. Robertson 4680*, Pt. Reyes Peninsula [UC]; *J. & R. Robertson 4682*, 5 km S of Stinson Beach, Mt. Tamalpais State Park, Marin Co. [UC]) Syn.: *Coelocaulon aculeatum*, *Cornicularia aculeata*

Note: CNALH lists 11 California collections from five locations, three of which are by the Robertsons. Others are by *M. Howe* (Orange Co. [COLO, FH, MIN, SBBG, UCR]) and *S. Tucker*

(11036, Marin Co. [SBBG]). The range of this species includes Washington, the Rocky Mountains, Alaska, and much of western Canada.

Cetraria muricata (Ach.) Eckfeldt (Robertson and Robertson 2002); Marin Co.: *R. Robertson 4678*, Pt. Reyes peninsula [UC]; Marin Co.: *R. Robertson 5910*, Mt. Tamalpais State Park [UC]; photo in Wirth 1995, p. 269) Syn.: *Coelocaulon muricatum* Note: Nine of 11 California collections in CNALH are by the Robertsons, from either Mt. Tamalpais or Pt. Reyes. This species ranges from Oregon north to Alaska and across Canada.

Chaenothecopsis debilis (Turner & Borrer ex Sm.) Tibell (Goward 1999; Peterson and Rikkinen 1999; Rikkinen 2003; Robertson 2003b; San Benito Co.: *R. Robertson 9398*, Condor Gulch Trail, Pinnacles National Park [UC]; Sierra Co.: *R. Robertson 9756*, Sierra Nevada Field Sta., 6 mi NE of Sierra City on Hwy 49 [SFSU, UC]) Note: Four of the seven known California collections of this pin-lichen are by the Robertsons. It is widespread across the US; Rikkinen (2003) cited collections from Mono, Inyo, and Trinity counties, held at Helsinki (H, not in CNALH).

Cladonia phyllophora Hoffm. (Hammer 1989; *R. Robertson 6053*, Mt. Tamalpais State Park, Marin Co. [UC]) Syn.: *C. degenerans* (Robbins 1931; Herre 1942) Note: Four of the eight California collections of this species are by S. Hammer, the *Cladonia* specialist. The Robertson report has been confirmed by S. Tucker. The range is from Oregon and the Rockies north over much of Canada.

Dermatocarpon rivulorum (Arnold) Dalla Torre & Sarnth. (Ryan and Nash 1991; Hutten et al. 2013, from Yosemite National Park; Sharnoff 2014; Inyo Co.: *B. Ryan 12611a, 12617a*, Eastern Brook Lakes Watershed [ASU]; Tulare Co.: *J. Shevock 17571*, Kern Plateau [ASU]; Lake Co.: *J. & R. Robertson 3672*, Guenoc Winery, Middletown [UC]) Note: This species is rare in California, with only seven collections known. It also occurs in several other western states and Alaska.

Dibaeis baeomyces (L. f.) Rambold & Hertel (Robertson 2002; photo in Wirth 1995, p. 373; *J. & R. Robertson 7127b*, Jackson State Forest, Mendocino Co. [UC]) Syn.: *Baeomyces roseus* Note: This is the only California collection in CNALH. This report is outside the range given in Brodo et al. (201, p. 299), coastal Washington north to Alaska, plus the east coast.

Endocarpon pulvinatum Th. Fr. (Herre 1910; Fink 1935; Ryan and Nash 1991; Brodo et al. [2001, p. 308, with color photograph]; Robertson and Robertson [2002, based on *J. & R. Robertson 6467*, Sonora Bridge campground, 3 km NW of Sonora Junction in drainage channels, Mono Co. [UC]; Modoc Co.: *J. Robertson 8901*, Soldier Creek [UC]; Hutten et al. 2013, from Yosemite National Park (*Hutten 14161*, not in CNALH); Inyo Co.: *B. Ryan 12770*, Eastern Brook Lakes Watershed, Sierra Nevada [ASU, MIN]). Note: Nine Robertson and three Ryan collections are among the 15 known for California. The species occurs throughout the western states, Alaska, British Columbia and Michigan.

Imshaugia aleurites (Ach.) S. L. F. Meyer (photograph in Wirth 1995, p. 435; Robertson and Robertson [2001, based on *R. Robertson 3955 & J. Robertson 3959*, ~5 mi. NW of Cazadero, W of King Ridge Road, Sonoma Co. [UC], verified by S. Tucker; color photograph but no California report in Brodo et al. [2001, p. 361-362]) Syn.: *Parmeliopsis aleurites* Note: These are the only California collections of this species in CNALH, although there have been other published reports. It is rare in the west, occurring in Arizona, Colorado, and Montana. It is more common in the eastern US.

Lecanora densa (Sliwa & Wetm.) Printzen (description in Ryan et al. 2004, pp. 214-215; Tucker 2012); Marin Co.: *J. & R. Robertson 7122a*, Kirby Cove campground [UC], det. by S. Tucker; *J. Robertson 7320* and *7320b*, Tennessee Valley, trail to beach [UC]) Note: CNALH lists seven California collections, of which four are by the Robertsons from two locations in Marin County. This species occurs commonly in other western US states.

Lecanora xylophila Hue (Ventura Co.: *Nash 38641*, San Nicolas Isl. [ASU]; Marin Co.: *R. Robertson 3392, 7532b, 7532c, 7532 d*, Pt. Reyes National Seashore [UC]) Note: CNALH lists six California collections, of which four are by R. Robertson from Pt. Reyes, Marin Co. Other records of this species, common on seaside logs, are from coastal Washington, Alaska, and the east coast of North America.

Loxosporopsis corallifera Brodo, Henssen & Imshaug (Brodo and Henssen 1995; Goward 1999; Brodo et al. [2001, p. 426-427, with color photograph]; Robertson 2002; Naesborg and Williams 2015 [Muir Woods, Marin Co.]) Note: This lichen is white, with isidia 0.5-1 mm long, sometimes branched, and is UV+ white. Four of the nine California collections are by the Robertsons, from Humboldt and Mendocino counties [UC]. The two from Mendocino Co. (*J. & R. Robertson 6727, 6738*, Van Damme State Park [UC]) are correct, while the two from Humboldt Co. (*J. & R. Robertson 2694, 2695*) are *Pertusaria coccodes* (Ach.) Nyl., with shorter (0.5 mm) tan isidia. Other California collections of *L. corallifera* are by B. McCune, H. Thiers, M. Cole and W. Jordan. This species has a range along the west coast from northern California to Alaska.

Maronea sp. (Humboldt Co.: *J. & R. Robertson 2756*, Horse Mtn summit, 2.5 mi SE of Berry Summit [UC]). The only *Maronea* reported in California is *M. polyphaea* H. Magn. Syn.: *M. constans* var. *subleideina* Hasse (photograph in Wirth 1995 [Pt. II, p. 568]) Note: CNALH lists seven California collections of *M. polyphaea* by six collectors, from Santa Barbara Co. south to San Diego Co. This crust resembles species of *Rinodina* superficially, but differs in being multisporeous with simple colorless spores, while *Rinodina* species are 8:nae, with brown 1-septate spores. The type of *M. constans* var. *subleideina* Hasse from the Santa Monica Mountains lacks any substances, unlike other specimens of *M. polyphaea* which contain submerochlorophaeic acid. *Maronea constans* s. str. contains sekikaic acid (LaGreca 2006). The Robertson collection and perhaps others from California may be a different species from *M. polyphaea*, if lichen acids are considered significant in this case.

Montanelia panniformis (Nyl.) Divakar et al. (Divakar et al. 2012; Hutten et al. 2013, from Yosemite National Park, citing *Hutten 14117 & YOSE 806*) Syn.: *Melanelia panniformis* (Robertson 2004; color photograph in Brodo et al. [2001, p. 437]) (Fig. 2). Note: CNALH lists five California collections, of which three are by R. Robertson: *5010, 5283*, Mt. Tamalpais, Marin Co. [UC], confirmed by S. Tucker; Contra Costa Co.: *R. Robertson 8511*, Mt. Diablo State Park [UC]. The other two are from Lake Co. (*S. Tucker 35502*, Bloody Rock trailhead on Hull Mtn Road [SBBG], & Lassen Co. (*D. Kowalski* s.n., junction of Susan River and Hwy 36 [CHSC]). This species has a discontinuous range that includes Oregon, Montana and western Canada.

Multiclavula corynoides (Peck) R. H. Peterson (Sharnoff 2014 [photograph, p. 367]; Marin Co.: *J. Robertson 10160 e*, Lucas Valley Road, Big Rock Trail, above Marinwood [SBBG]) Note: This is the only California collection in CNALH. Its range is the Pacific Northwest. Another seven Robertson collections at UC are of *Multiclavula* to genus only.

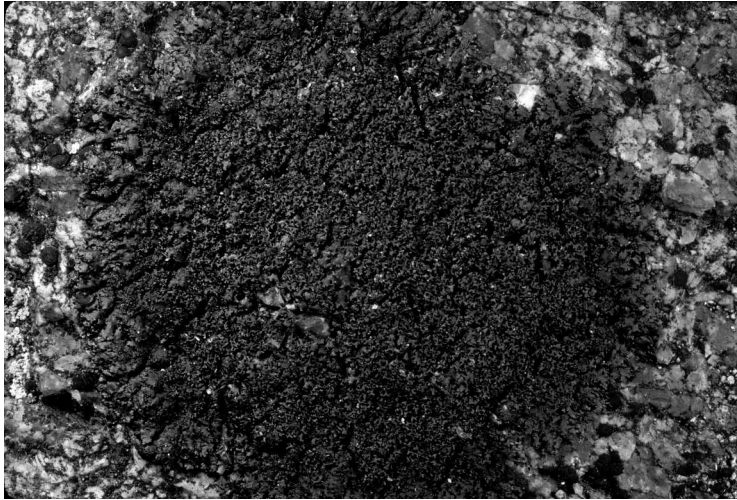


Figure 2. *Montanelia panniformis* (Nyl.) Divakar et al. Photograph by Stephen Sharnoff (no. 1082.36, from Maine)

Opegrapha pulvinata Rehm (Diederich 2003; Kocourková et al. 2012; Marin Co.: *J. Robertson* s.n., Mt. Tamalpais State Park [ASU], determined by D. Ertz, a specialist for this genus.) Note: CNALH lists only one California collection of this lirelline crust. Most US collections are from the midwest.

Pertusaria coccodes (Ach.) Nyl. (description in Tønberg 1992, p. 256, no mention of U S distribution; photograph but no mention of CA, Wirth 1995 (Pt. II, p. 695); Humboldt Co.: *J. & R. Robertson* 2694, 2695, Lanphere Dunes [UC]). It is rare in CA, with only two CA collections in CNALH, both from Point Lobos Reserve, Monterey Co., determined by S. Tucker. A third collection (*M. Cole* 10808, Fort Bragg, Jackson State Forest off Mitchell Creek Lane, Mendocino Co. [UC]) had been misidentified as *Loxosporopsis corallifera*. The crust of *P. coccodes* is almost entirely covered by short (to 0.5 mm long) cylindrical unbranched tan isidia, and is K+ red, while that of *Loxosporopsis corallifera* has white isidia, 0.5-1 mm long, sometimes branched, and is UV+ white.

Phaeorrhiza nimbosa (Fr.) H. Mayrhofer & Poelt (Rosentreter et al. [2007] with photograph; Tulare Co.: *Blakeman* 210, Sequoia National Park, Redwood Canyon [MIN]; Fresno-Inyo counties: *H. Imshaug* 18116, Mono Pass [MSC], *H. Imshaug* 18080, Sierra Nevada [MSC]; Mono Co.: *R. Robertson* 9202, White Mountains Research Station, above Patriarch Grove [UC]) Note: This high-elevation squamulose species grows on soil and is rare in California, with only four collections known. It occurs in most of the western states.

Phylliscum demangeonii (Moug. & Mont.) Nyl. (Henssen 1977; Goward et al. 1994; photograph in Wirth 1995 [Pt. II, p. 723]; Robertson and Robertson [2001, based on *J. & R. Robertson* 3777, 3823, on shaded vertical serpentine, Mt. Tamalpais State Park, Marin Co. [UC]; D. Baltzo (2002, based on *H. Thiers* 15283, San Francisco Watershed, San Mateo Co. [not in CNALH]); Hutten et al. 2013, Yosemite National Park, citing *Schultz* 16577b [not in CNALH]) Note: This lichen forms tiny black stalked clusters on rock. Only four California collections are shown in CNALH, two of which are by the Robertsons from Mt. Tamalpais. Most US collections are from other western states.

Placidium andicola (Breuss) Breuss (Doell et al. 1999, citing *J. & R. Robertson* 1944, Cove Springs, Granite Mountains, San Bernardino Co. [UC]; San Bernardino Co.: *K. Knudsen*

13411, Joshua Tree National Park, Mojave Desert [UCR]) Syn.: *Catapyrenium andicola* (Breuss 1993) Note: This species of brown squamules on soil is rare in California with five collections. It is also rare outside California, with collections from Arizona, New Mexico, and Kansas.

Placidium fingens (Breuss) Breuss (Breuss & Bratt 2001; Breuss 2002; Lake Co.: *L. Sigal s.n.*, Hell's Peak [ASU]; Sonoma Co.: *J. & R. Robertson 7503*, Pepperwood Ranch Preserve [UC]) Note: This species is rare in California, having been collected only twice. Two other collections are known from Arizona. It has brown squamules, and occurs on soil and bark.

Segestria leptalea (Durieu & Mont.) R. C. Harris (description in Smith et al., 2009, p.736; Williams and Sillett 2007; Los Angeles Co.: *H. Hasse 786*, Santa Monica Mountains [MIN]; Mendocino Co.: *J. & R. Robertson 6718*, Navarro River, Redwood State Park [UC]; Monterey Co.: *K. Knudsen 9947, 9969*, Limekiln State Park, Santa Lucia Mountains [NY, UCR]; Sonoma Co.: *R. Naesborg 1736*, Armstrong Redwoods State Natural Reserve [UC]) Syn.: *Porina leptalea* Note: This is a pyrenocarpous lichen that grows on bark. CNALH includes only four California collections of this species. It has also been collected in Pennsylvania and Florida.

Staurothele clopimoides (Bagl. & Carestia) J. Steiner (Thomson [1991 with photograph, collection cited from Siskiyou Co.]; Hutten et al. 2013, citing *Hutten 13118* [not in CNALH] from Yosemite National Park; Siskiyou Co.: *B. Ryan 25258*, Marble Mtn Wilderness [ASU]; Mono Co.: *J. Robertson 9235b, 9235c*, White Mtn Research Sta., road from Patriarch Grove to Bancroft Gate [SBBG, UC]) Note: CNALH includes only seven California collections from three locations of this high-elevation species on rock. It has been collected in other western states.

Synalissa symphorea (Ach.) Nyl. (photograph in Wirth [1995. Pt. II, p. 889]; Goward 1999; Mendocino Co.: *J. & R. Robertson 7136*, W of Mitchell Creek Dr., Jackson State Forest [UC]; *T. E. Weier 2245, 2247, 2248*, Hole-in-the-Rock campground, North Providence Mountains, San Bernardino Co. [UC]; *T. E. Weier s.n.*, S of Essex, San Bernardino Co. [UC]) Syn.: *Omphalaria symphorea* (Hasse 1906), *S. symphorea* var. *sphaerospora* (Herre 1944) Note: CNALH includes only five California collections of this species from three locations, including four by T. Weier. Most other collections are from midwest US, from Minnesota to Texas.

Thelenella muscorum (Fr.) Vainio (McCune and Rosentreter 2007 [photograph, p. 29]; Hutten et al. 2013, based on *Hutten 14264* [not in CNALH] from Yosemite National Park; Santa Barbara Co.: *T. Nash 32541*, Prisoner's Harbor, Santa Cruz Isl. [ASU]; Lake Co.: *J. & R. Robertson 3676*, Guenoc Winery, over mosses in chaparral [UC], verified by I. Brodo; Marin Co.: *J. Lendemmer 5842*, Mt Tamalpais State Park, near Bootjack Camp [PH]) Syn.: *Chromatochlamys muscorum* var. *muscorum* (Mayrhofer 2002; Robertson and Robertson [2002]) Note: There are only three known California collections of this species. It occurs in other western states east to Missouri and Michigan. This lichen is a thin gray crust with sunken perithecia, growing on bryophytes in mountains.

Toensbergia leucococca (Vain.) Bendyksby & Timdal Syn.: *Pycnora leucococca* (Vain.) R. Sant. (Mendocino Co.: *J. & R. Robertson 59*, Bloody Point [UC]; San Francisco Co.: *J. & R. Robertson 2416a, c, d*, Lincoln Park, San Francisco [UC]), *Hypocenomyce leucococca* R. Sant. Note: These are the only California collections of this species in CNALH. It is rare elsewhere, with collections from Washington, Newfoundland, British Columbia, Quebec and Sweden. This lichen resembles *Hypocenomyce scalaris*, is pale in color, sorediate below, but is K+ yellow, PD+ yellow, C+ pink (alectorialic acid) unlike the latter (which is K-, PD-, C+ red; lecanoric acid).

Tremella nieblae Diederich & van den Boom (Diederich 2007; Diederich 2008 [2007]; Sonoma Co.: *J. & R. Robertson 6545*, Chancellor Wetlands [SBBG], determined by P. Diederich; San Luis Obispo Co.: *S. Tucker 34216B*, coastal outcrops, near Point Bouchon, Diablo Canyon Power Plant, Avila Beach [SBBG], determined by P. Diederich; Santa Barbara Co.: *K. Knudsen 7837*, Santa Rosa Isl. [UCR]) Note: This lichenicolous is a California endemic and has been found only four times in California, although it has probably been overlooked. The type is *van den Boom 29018* on *Niebla cephalota*, Point Lobos State Reserve, Monterey Co. [not in CNALH].

Tremolecia atrata (Ach.) Hertel (Brodo et al. 2001, photograph on p. 688; Robertson and Robertson 2001, 2002; Robertson 2005a; Robertson and Beyer 2005; photograph on back cover of CALS Bulletin 7 [2], 2000; Hutten et al. 2013, based on *Breuss 29766* [not in CNALH] from Yosemite National Park; Marin Co.: *J & R. Robertson 4581*, near West Peak, Mt. Tamalpais State Park [UC]; Glenn Co.: *J. & R. Robertson 6985*, on granite, Black Butte [UC]) Fig. 3, on the front cover of this issue of *Evansia*). Note: CNALH lists 17 California collections of this species, all by the Robertsons (from Contra Costa, Glenn, Lake, Marin, Modoc, Sierra, & Sonoma counties). It is probably fairly common in California, but unrecognized by most collectors. Its range is coastal, north to Alaska, and the Rocky Mountains.

Xanthomendoza montana (Lindblom) Søchting, Kärnefelt & S. Y. Kondr. (color photograph in Nash et al. [vol. II, 2004, opposite p. 375]; Knudsen and Kramer 2007; Sharnoff 2014 [photograph, p. 133]; Modoc Co.: *J. Robertson 8816*, 11 mi west of Madeline [UC]; Sierra Co.: *J. Robertson 9798*, Hwy 49, east of Yuba Pass [UC]) Syn.: *Xanthoria montana* (Robertson and Beyer 2005) Note: CNALH lists 16 collections from seven California locations. This species is more common in Oregon, interior western states and central midwestern states.

The Robertsons published two articles about some of their lichen finds that they considered noteworthy (Robertson and Robertson 2001, 2002). Some of these species are described above, while others have later been shown to be more widely collected in the state. Among these are *Dendriscoaulon intricatum* (Nyl.) Henssen, *Heppia conchiloba* Zahlbr., *Heterodermia namaquana* Brusse, *Japewia tornoenis* (Nyl.) Toensberg, *Lobothallia alphoplaca* (Wahlenb.) Hafellner, *Niebla procera* Rundel & Bowler, *Physcia erumpens* Moberg (Fig. 4), *Placopyrenium stanfordii* (Herre) K. Knudsen, *Protoparmelia badia* (Hoffm.) Hafellner, *Sparria cerebriformis* (Egea & Torrente) Ertz & Tehler, *Solenopsora crenata* (Herre) Zahlbr., and *Sphinctrina tubaeformis* A. Massal.

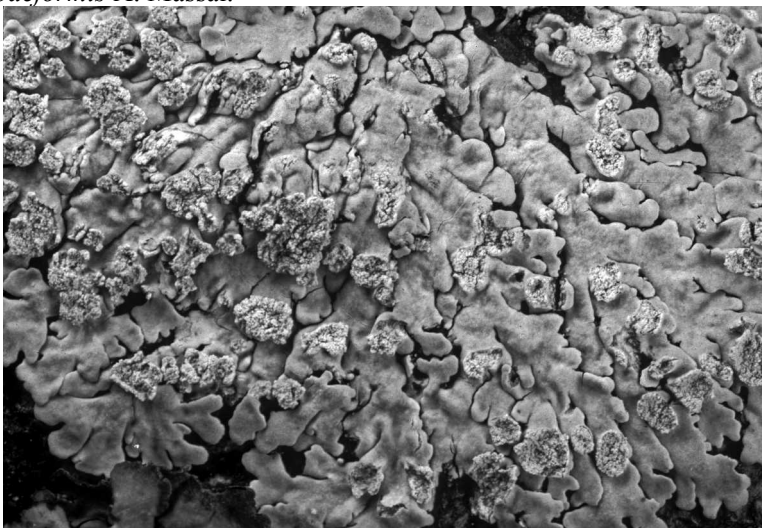


Figure 4. *Physcia erumpens* Moberg. Photograph by Stephen Sharnoff (no. 2317.11, from CA).

*Herbarium abbreviations used in this paper:

ASU -Arizona State University

CHSC – Chico State University

CNALH –Consortium of North American Lichen Herbaria

COLO – University of Colorado

F - Field Museum, Chicago

FH – Farlow Herbarium, Harvard University

MIN- University of Minnesota

MSC – Michigan State University

NY – New York Botanic Garden

PH – Philadelphia Academy of Sciences

SBBG -Santa Barbara Botanic Garden

SFSU – San Francisco State University

UC – University of California, Berkeley

UCR – University of California, Riverside

YOSE – collection at Yosemite headquarters, not in CNALH

LITERATURE CITED

- Baltzo, D.E. 2002 (2001). San Francisco Watershed lichens - a more comprehensive list. *Bulletin of the California Lichen Society* 8: 44-56.
- Breuss, O. 1993. *Catapyrenium* (Verrucariaceae) species from South America. *Plant Systematics and Evolution* 185: 17-33.
- Breuss, O. 2002. *Endocarpon*, pp. 181-187. *In*: T. H. Nash III, B. D. Ryan, C. Gries, and F. Bungartz (eds.), *Lichen flora of the Greater Sonoran Desert region, Vol. 1*. Tempe: Lichens Unlimited, Arizona State University.
- Breuss, O. and C.C. Bratt. 2001 (2000). *Catapyrenioid lichens in California*. *Bulletin of the California Lichen Society* 7: 36-43.
- Brodo, I.M. and A. Henssen. 1995. A new isidiate crustose lichen in northwestern North America. Pp. 27-41. *In*: E. E. Farkas, R. Lücking, and V. Wirth (eds.), *Scripta Lichenologica - Lichenological papers dedicated to Antonin Vezda*. *Bibliotheca Lichenologica* 58. Berlin, Stuttgart: J. Cramer.
- Brodo, I. M., S.D. Sharnoff and S. Sharnoff. 2001. *Lichens of North America*. New Haven: Yale University Press. 795 pp.
- Carlberg, T. 2010. In memory of Judy Robertson. *Bulletin of the California Lichen Society* 17 (1&2): 16-18.
- Diederich, P. 2003. New species and new records of American lichenicolous fungi. *Herzogia* 16: 41-90.
- Diederich, P. 2007. New or interesting lichenicolous Heterobasidiomycetes. *Opuscula Philolichenum* 4: 11-22.
- Diederich, P. 2008 (2007). *Tremella*. Pp. 405-407. *In*: T. H. Nash III, C. Gries, and F. Bungartz (eds.), *Lichen flora of the Greater Sonoran Desert region, Vol. 3*. Tempe: Lichens Unlimited, Arizona State University.
- Divakar, P. K., R. Del-Prado, H.T. Lumbsch, M. Wedin, T.L. Esslinger, S.D. Leavitt and A. Crespo. 2012. Diversification of the newly recognized lichen-forming fungal lineage *Montanelia* (Parmeliaceae, Ascomycota) and its relation to key geological and climatic events. *American Journal of Botany* 99: 2014-2026.
- Doell, J., S.C. Tucker and J. Robertson. 1999. Lichens of the Sweeney Granite Mountains Desert Research Center and environs. *Bulletin of the California Lichen Society* 6: 8-12.
- Fink, B. 1935. The lichen flora of the United States. *Ann Arbor*.

- Goward, T. 1999. The Lichens of British Columbia. Part 2. Fruticose species. Special Report ser. 9. British Columbia Ministry of Forests. Victoria, B.C.: Crown Publications Inc.
- Goward, T., B. McCune and D. Meidinger. 1994. The lichens of British Columbia. Illustrated keys. Part 1. Foliose and squamulose species. Victoria, B.C.: British Columbia Ministry of Forests, Crown Publications Inc.
- Hammer, S. 1989. Phytogeographical notes on acidophilous *Cladonia* species in California. *Madroño* 36: 169-174.
- Hasse, H.E. 1906. Contributions to the lichen flora of southern California. *Bulletin of the Southern California Academy of Sciences* 5: 38-45.
- Henssen, A. 1977. The genus *Zahlbrucknerella*. *Lichenologist* 9: 17-46.
- Herre, A.W.C.T. 1910. The lichen flora of the Santa Cruz peninsula, California. *Proceedings of the Washington Academy of Sciences* 12: 27-269.
- Herre, A.W.C.T. 1942. Additions to and comments upon the lichen flora of the Santa Cruz Peninsula, California. *American Midland Naturalist* 28: 752-755.
- Herre, A.W.C.T. 1944. Lichens new to central California. *The Bryologist* 47: 86-90.
- Hutten, M., U. Arup, O. Breuss, T.L. Esslinger, A.M. Fryday, K. Knudsen, J.C. Lendemer, C. Printzen, H.T. Root, M. Schultz, J. Sheard, T. Tønsberg and B. McCune. 2013. Lichens and lichenicolous fungi of Yosemite National Park, California. *North American Fungi* 8: 1-47.
- Knudsen, K. and K.A. Kramer. 2007. The lichen flora of the San Jacinto Mountains: San Jacinto Wilderness Area, San Bernardino National Forest, Riverside County, California, USA. *Evansia* 24: 42-47.
- Kocourková, J., K. Knudsen and S.C. Tucker. 2012. Checklist of the lichenicolous biota of California. *Opuscula Philolichenum* 11: 64-103.
- LaGreca, S. 2006. Notes on the chemistry of *Maronea constans* and *Maronea polyphaea* (Fuscideaceae). *Lichenologist* 38: 595-598.
- Mayrhofer, H. 2002. *Chromatochlamys*, pp. 130-131. In: T.H. Nash III, B.D. Ryan, C. Gries and F. Bungartz (eds.), *Lichen flora of the Greater Sonoran Desert region, Vol. 1*. Tempe: Lichens Unlimited, Arizona State University.
- McCune, B. and R. Rosentreter. 2007. Biotic soil crust lichens of the Columbia Basin. *Monographs in North American Lichenology* vol. 1. Corvallis, Oregon: Northwest Lichenologists.
- Naesborg, R.R. and C. Williams. 2015. Lichen diversity in Muir Woods National Monument. *Bulletin of the California Lichen Society* 22: 13-18.
- Peterson, E.B. and J. Rikkinen. 1999. Range extensions of selected pin-lichens and allied fungi in the Pacific Northwest. *The Bryologist* 102: 370-376.
- Rikkinen, J. 2003. Calicioid lichens and fungi in the forests and woodlands of western Oregon. *Acta Botanica Fennica* 175 (or I75): 1-41.
- Robbins, C.A. 1931. *Cladonias* collected by S.F. Blake in the western United States. *Rhodora* 33: 135-139.
- Robertson, J. 2002. Pygmy Forest field trip, Mendocino County, March 16, 2002, and list of macrolichens of the Pygmy Forest. *Bulletin of the California Lichen Society* 9: 8-12.
- Robertson, J. 2003. CALS field trip to UC White Mountains Research Station, July 11-13, 2003. *Bulletin of the California Lichen Society* 10: 42-45.
- Robertson, J. 2004. CALS field trip to Mount Diablo State Park, January 31, 2004. *Bulletin of the California Lichen Society* 11: 20-22.
- Robertson, J. 2005a. Field trip to Robert Louis Stevenson State Park, Napa Co. *Bulletin of the California Lichen Society* 12: 15-16.
- Robertson, J. 2005b. Field trip to Rock Spring, Mount Tamalpais State Park. *Bulletin of the California Lichen Society* 12: 19-20.

- Robertson, J. and C. Beyer. 2005. CALS Field trip to Modoc County, Sept. 25-26, 2004. Bulletin of the California Lichen Society 12: 12-15.
- Robertson, J. and R. Robertson. 2001 (2000). New and interesting records of lichens from California. Bulletin of the California Lichen Society 7: 64-66.
- R Robertson, J. and R. Robertson. 2002 (2001). New and interesting records of lichens from California. Bulletin of the California Lichen Society 8: 56-58.
- Rosentreter, R., M. Bowker and J. Belnap. 2007. A Field guide to biological soil crusts of western US Drylands. Denver: US Government Printing Office.
- Ryan, B.D., H.T. Lumbsch, M.I. Messuit, C. Printzen, L. Sliwa and T.H. Nash III. 2004. *Lecanora*, pp. 176-286. In: T. H. Nash III, B. D. Ryan, P. Diederich, C. Gries and F. Bungartz (eds.), Lichen flora of the Greater Sonoran Desert region, Vol. 2. Tempe: Lichens Unlimited, Arizona State University.
- Ryan, B.D. and T.H. Nash III. 1991. Lichens of the Eastern Brook Lakes watershed, Sierra Nevada Mountains, California. The Bryologist 94: 181-195.
- Sharnoff, S. 2014. A field guide to California lichens. New Haven: Yale University Press. 405 pp.
- Smith, C.W., A. Aptroot, B.J. Coppins, A. Fletcher, O.L. Gilbert, P.W. James and P.A. Wolseley. 2009. The Lichens of Great Britain & Ireland. London: The British Lichen Society. 1046 pp.
- Thomson, J.W. 1991. The lichen genus *Staurothele* in North America. The Bryologist 94: 351-367.
- Tønsberg, T. 1992. The sorediate and isidiate, corticolous, crustose lichens in Norway. Sommerfeltia 14: 1-331.
- Tucker, S.C. 2012a. Lichens of Sedgwick Reserve and Santa Barbara County. Santa Barbara: Cheadle Center for Biodiversity, University of California. 138 pp.
- Tucker, S.C. 2014. Revised catalogue of lichens, lichenicolous and allied fungi in California. <http://ucjeps.berkeley.edu/constancea/85/index.html>
- Wetmore, C.M. 1985. Lichens and air quality in Sequoia National Park. Final Report, (US) National Park Service Contract CX 0001-2-0034.
- Wetmore, C.M. 2003. The *Caloplaca squamosa* group in North and central America. The Bryologist 106: 147-156.
- Williams, C. B. and S. Sillett. 2007. Epiphyte communities on redwood (*Sequoia sempervirens*) in northwestern California. The Bryologist 110: 420-452.
- Wirth, V. 1995. Die Flechten Baden-Wuertembergs. Pts. 1, 2. Stuttgart: Ulmer.