Bulletin

of the

California Lichen Society

Volume 16 No. 2 Winter 2009

The California Lichen Society 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. Dues categories (in $US per year): Student and fixed income - $10, Regular - $20 ($25 for foreign members), Family - $25, Sponsor and Libraries - $35, Donor - $50, Benefactor - $100 and Life Membership - $500 (one time) payable to the California Lichen Society, PO Box 7775 #21135 , San Francisco, California 94120-7775. Members receive the Bulletin and notices of meetings, field trips, lectures and workshops.

The Bulletin of the California Lichen Society (ISSN 1093-9148) is edited by Tom Carlberg, tcarlberg7@yahoo.com. The Bulletin has a review committee including Larry St. Clair, Shirley Tucker, William Sanders, and Richard Moe, and is produced by Eric Peterson. The Bulletin welcomes manuscripts on technical topics in lichenology relating to western North America and on conservation of the lichens, as well as news of lichenologists and their activities. The best way to submit manuscripts is by e-mail attachments or on a CD in the format of a major word processor (DOC or RTF preferred). Submit a file without paragraph formatting; do include italics or underlining for scientific names. Figures may be submitted electronically or in hard copy. Figures submitted electronically should provide a resolution of 300 pixels-per-inch (600 minimum for line drawings in JPEG format); hard copy figures may be submitted as line drawings, unmounted black and white glossy photos or 35mm negatives or slides (B&W or color). Email submissions of figures are limited to 10 MB per email, but large files may be split across several emails or other arrangements can be made. Contact the Production Editor, Eric Peterson, at eric@theothersideofthenet.com for details of submitting illustrations or other large files. A review process is followed. Nomenclature follows Esslinger cumulative checklist on-line at http://www.ndsu.nodak.edu/instruct/esslinge/chcklst/chcklst7.htm. The editors may substitute abbreviations of author's names, as appropriate, from R.K. Brummitt and C.E. Powell, Authors of Plant Names, Royal Botanic Gardens, Kew, 1992. Instructions to authors will soon be available on the Society's web site (below). Style follows this issue. Electronic reprints in PDF format will be emailed to the lead author at no cost.

The deadline for submitting material for the Summer 2010 CALS Bulletin is 15 May 2010.

The California Lichen Society is online at http://CaliforniaLichens.org and has email discussions through http://groups.yahoo.com/group/CaliforniaLichens.

Volume 16 (2) of the Bulletin was issued 26 January 2010.

Front cover: Hummingbirds in nest using lichen; see photo essay starting page 29. Photography by Jenny Moore.

Bulletin of the California Lichen Society

VOLUME 16 NO. 2 WINTER 2009

Thamnolia vermicularis, Sponsorship for the CALS Conservation Committee

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Executive Summary

Thamnolia vermicularis is a widespread, fruticose, lichenized fungus which occurs over soil and stone at high latitudes and altitudes on all continents except Africa and Antarctica (Nelsen and Gargas 2009). In California it is rare, known only from 2 locations less than 1 mile apart along the central coastline in Marin County.

Wright (1992) first found it in California atop a single sandstone outcrop in Marin County, and suggested that, in that elevated location, it had protection from being trampled by cattle pastured at their bases. He raised the possibility of a wider occurrence along the coast before the advent of dairying.

The second 'colony' was located not far from the first during one of the field trips arranged during the International Association of Lichenologists 2008 meeting at Asilomar, California. These colonies are at risk from trampling by humans or cattle, vehicular traffic, road maintenance and shoulder widening, and development of agricultural land, as the colonies occur both on private land currently used for grazing cattle and potentially available for subdivision, and also along a county road at the intersection of a private ranch road near a popular parking area and overlook, Elephant Rock. The Dillon Beach Plan (1989) calls for considering pull-out zones and wider shoulders along the county's Dillon Beach Road .

TAXONOMY

Accepted scientific name: *Thamnolia vermicularis* (Swartz) Ach ex Schaerer. Icmadophilaceae, Pertusariales, Ostropomycetidae, Lecanoromycetes, Ascomycota, Fungi.

Common name: whiteworm lichen.

Plant code: THVE60

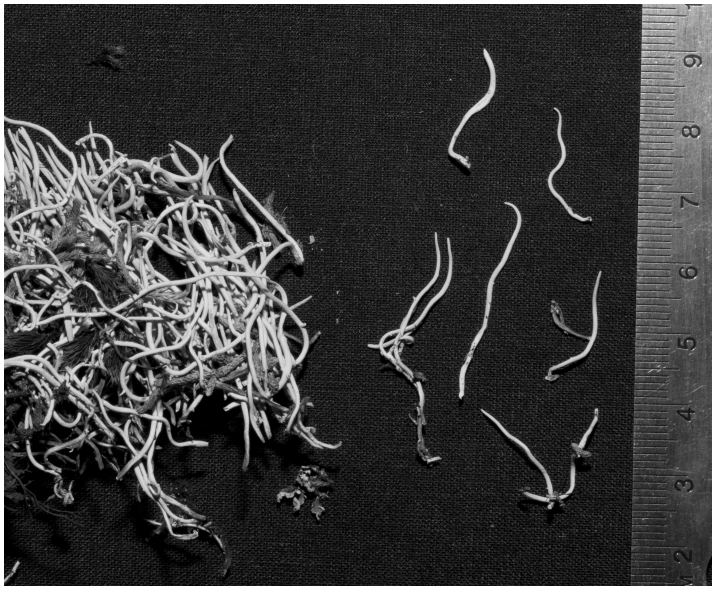
Type specimen and location: *Thamnolia vermicularis* (Sw.) Ach. ex Schaer. Enum. Crit. Lich. Europ. (Bern): 243. 1850. Stockholm

Synonyms: *Cenomyce vermicularis, Cerania vermicularis, Lichen vermicularis, Thamnolia vermicularis subsp. vermicularis*

DESCRIPTION

Thamnolia vermicularis belongs to the Deuteromycetes, the "imperfect fungi." Considered a 'cladoniform' lichen because of shared morphological characters with the genus *Cladonia*., this medium-sized to large stratified fruticose (club) lichen consists of loose to dense clusters of erect or decumbent thalli called pseudopodetia that are white or cream-white with a generally smooth surface and that terminate in pointed tips. The pseudopodetia are more or less round in cross-section, slender, to (15-) 30-45 (-70) mm long and 0.8 – 1.2 (-1.5) mm wide, dull, often frosted/pruinose (especially at the tips), corticate, brittle, hollow, unbranched to sparsely branched, the branching irregular.

Medulla is white, thin, of longitudinally-oriented hyphae, and the cortex is paraplectenchymatous, also of more or less longitudinally-oriented hyphae. A central ring called a stereome provides support for the thallus and may function to elevate the podetia for easier fragmentation by wind and animals. Photobiont is green, chlorococcoid: Trebouxia.



Thamnolia vermicularis, specimen from Oregon (EBP# 2713; hb. Peterson). Scale is in centimeters. Photo by Eric Peterson.

(Brodo et al 2001, Cassie 2006, and Goward 1999).

Thamnolia vermicularis generally has been considered sterile. Ascocarps, soredia, isidia, and pseudocyphellae are absent. However, there have been occasional reports of sexual reproduction or specialized vegetative propagules within the genus. Nelsen and Gargas (2009) cited a personal communication with A. Knight, and also cited an article in a French-language publication that *T. vermicularis* occasionally produces pycnidia with conidia. Conidia are thought to function as spermatia, fertilizing other individuals. However, the primary mode of dispersal and persistence in *Thamnolia* is thought to be a result of asexual fragmentation of the branches of the thallus. Lateral branches develop as small bulges on the thallus eventually growing into slender stalks which break loose and become new independent thalli.

T. vermicularis grows on many types of tundras, from bare, open gravels and frost boils to rich moist, mossy thickets among the willows and heaths. It can be found attached to the substrate by unspecialized lateral holdfasts, or, often, unattached - - over rock and gravelly soil in exposed sites, mostly at alpine elevation, but also rare in coastal regions at lower elevations. St. Clair (1999) notes it as locally common and abundant in arctic, alpine, and subalpine, often in exposed plus or minus rocky locations throughout western North America. Brodo et al (2001) suggests that it can be found on windswept slopes close to sea level on the northwest coast. Reactions: UV-, K+ yellow, P+ orange to red. Contents: thamnolic acid. (Thomson 1984).

The absence of sexual reproduction is thought to be detrimental to the longevity of a species. However, in their research findings, Nelsen and Gargas (2009) report that *T. vermicularis* fungi associate with a wide range of algal symbionts, and they conclude that *symbiont switching* may provide an alternative mechanism to maximize fitness in fungi lacking or rarely undergoing genetic recombination. Shuffling relationships between fungal and algal symbionts may lead to fungi associating with algal symbionts more capable of surviving various selective pressures, thereby aiding the survival and persistence of these fungi, and the association as a whole (Nelsen and Gargas 2009).

Thamnolia subuliformis has been considered a variety of T. *vermicularis*. (*T. vermicularis* var. *subuliformis*). Kärnefelt and Thell studied populations in northern Russian and Finland and concluded (1995) that there is only one species, with great chemical and morphological variability, *T. vermicularis* Ach. ex Schaer., with a subspecies *solida* (Sato) W.A. Weber that has flattened podetia and a more or less solid medulla.

However, recent molecular work on *Thamnolia* by Platt & Spatafora (2000) found sufficient genetic distance between *T. vermicularis* (containing thamnolic acid) and *T. subuliformis* (containing squamatic and baeomycesic acids and has a UV+Y cortex and a UV+ blue-white medulla) to warrant specific recognition. In the herbarium, *T. vermicularis* becomes pinkish and stains paper brown on long standing. However, the species are morphologically indistinguishable.

Similar species and distinguishing characteristics: Whiteworm lichen looks like hundreds of tiny chalky gray stalagmites or minute weathered antlers (Zwinger 1972). In this regard, it could be superficially confused with some species of *Cladonia*, such as *C. cornuta* or *C. gracilis*, however, *Cladonia* thalli are differentiated into a basal, crustose to squamulose primary thallus and an erect secondary thallus (podetia). Furthermore, as Culberson (1963) pointed out, lichens in the genus *Thamnolia* have whitish thalli with curved, hollow,


Figure 1: Habitat at Elephant Rock near Dillon Beach.

pointed, elongated or horn-like branches. They are always sterile (see discussion above). And because their morphology is unique, and varies so little, most lichenologists had considered it to be monotypic and represented by *T. vermicularis* (Sw.) Ach. In the 1960s, M. Sato studied the mixture ratio in various parts of the world of what would become to be accepted as two distinct species.

Thamnolia vermicularis and *T. subuliformis* are essentially identical in form, but differ in chemistry and distribution (McCune & Geiser 2009). *T. vermicularis* is K+ deep yellow, P+ orange, UV-, while *T. subuliformis* is K- or K+ pale yellow, P+ yellow, UV+ whitish. *T. subuliformis* is also reported to have antibiotic properties (Huneck 1999). The distributions of the two chemotypes overlap in the American Arctic, but the thamnolic acid chemotype predominates in the coastal mountains and to the west of those ranges in western North America, whereas *T. subuliformis* is the species encountered in the Rocky Mountains and northern Appalachians and predominates east of the coast ranges in western North America. However, according to McCune (1997), mixed populations are found within the Cascades. Culberson found that the situation in *Thamnolia* where there is the outright replacement of one substance by others rather than one of the casual occurrence of additional substances, to be most significant. Additionally, Culbertson (1963) suggested that M. Sato had demonstrated, from an examination of many herbarium specimens of these two lichens, that the geographic ranges of the chemically different types are not identical although they broadly overlap.

Biological Characteristics

***Growth form*:** fruticose.
***Reproductive method*:** fragmentation.
***Dispersal agents*:** wind, caribou.
***Substrate and specificity*:** terricolous.
***Habitat and specificity*:** arctic and alpine tundra; rare in coastal regions at lower elevations
***Pollution sensitivity*:** unknown
***Ecological function*:** used as nesting material by golden plover, ethnic uses in China ("snow tea" – "Xuecha") for inflammation, fever, sore throats, hypertension, etc (Buntaine et al 2006; Jiang et al 2001)), a natural antioxidant (Luo et al 2006), as a vermicide (Upreti et al 2005).


Figure 2: *Thamnolia vermicularis* at Elephant Rock. Photo by John and Susan Wolf.

Geography

Global: *Thamnolia vermicularis* has a circumpolar distribution, and is found in arctic and northern boreal and montane regions worldwide except in Africa and Antarctica. Sheard (1977) reported that *T. vermicularis* is predominantly a southern hemisphere lichen (whereas *T. subuliformis* is predominantly a northern hemisphere lichen).

Local: In North America and Greenland, *T. vermicularis* range appears to be more restricted than that of *T. subuliformis*, ranging neither as far north nor as far south as the latter. Although more common in Oregon, in California it is known only from two locations along the coast in Marin County, near Dillon Beach. McCune (pers. comm.) suggests that there may be habitat on Mt. Shasta.

Population Trends

Unknown.

Threats

History: Although this lichen has been used for ethnic purposes in Asia, there is no indication at this time that this poses a major threat worldwide; in California, this lichen has been found only along the central coast at 2 sites, within 0.6 miles of each other. One site is on private rangeland, the other site is within the road right-of-way next to a heavily used area called Elephant Rock, which is most likely private but used by the public to park and view the ocean. This lichen grows on the ground, and historic threats include trampling by livestock, competition from surrounding vegetation, and parking on or trampling by humans.

Future: This lichen is confined to arctic/alpine tundra habitat and some sites along the coast in western North America. Future global threats would include increasing ethnic use as the human population increases, and climate change. Within California, the threats include trampling by livestock, and parking on or trampling by human.

Protection

None known for this lichen, either globally or locally.

Conservation Summary

In California, this lichen has no conservation status. Because it is now generally accepted that *Thamnolia vermicularis* and *T. subuliformis* are two separate species, the global extent of each has subsequently been reduced.

Specific Conservation Recommendations

Recommended Global Rarity Rank: G3G5
Current Global Ranking in NatureServe (http://www.natureserve.org)

Recommended Global Threat Rank: .3

Recommended Local Rarity Rank: S1
Current California ranking in NatureServe.

Recommended Local Threat Rank: .1
Current California Threat Ranking in NatureServe

Recommended List: 2

Recommended Conservation/Management Actions

Recommend inventory on private and other lands along the coast where landowners will co-operate. Because most of the coastal land is private, most likely there may be additional occurrences found. After inventory, recommend the best site/sites for conservation status, such as land exchange, etc. Work with landowners of currently known occurrences/or Marin County Road Department to conserve the current sites.

Relevant Experts and Knowledgeable Botanists

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Stakeholders For Notification of Comment Period

Redwood National and State Parks
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Muir Woods National Monument
Mill Valley, California 94941-2696

Point Reyes National Seashore
1 Bear Valley Rd.
Point Reyes Station, CA 94956

Golden Gate National Recreation Area
Fort Mason, Building 201
San Francisco, California 94123-1307

Alcatraz Island, Golden Gate
National Recreation Area
Fort Mason, B201
San Francisco, CA 94123

Presidio Interpretation
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San Francisco, CA 94123

Bureau of Land Management
King Range National Conservation
Area Project Office
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Marin District
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Russian River District
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Mendocino District
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County distribution of *Thamnolia vermicularis* in California(Marin Co.).

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LOCATION/SPECIMEN LIST

1 38°15'N, 122°56'W, 1/23/1988, Darrell Wright, 3008? at UC, 3082 at SFSU, on sandstone in coastal grassland.

2 Zone 10S 504XXX* 4233XXX NAD83, 7/20/2008, Cheryl Beyer, 5153 and 5154, JEPS, on soil over sandstone in coastal grassland.

* = The CALS Conservation Committee does not publish precise localities of populations.

A Photo Essay of Lichens and Animals

Edited by Tom Carlberg
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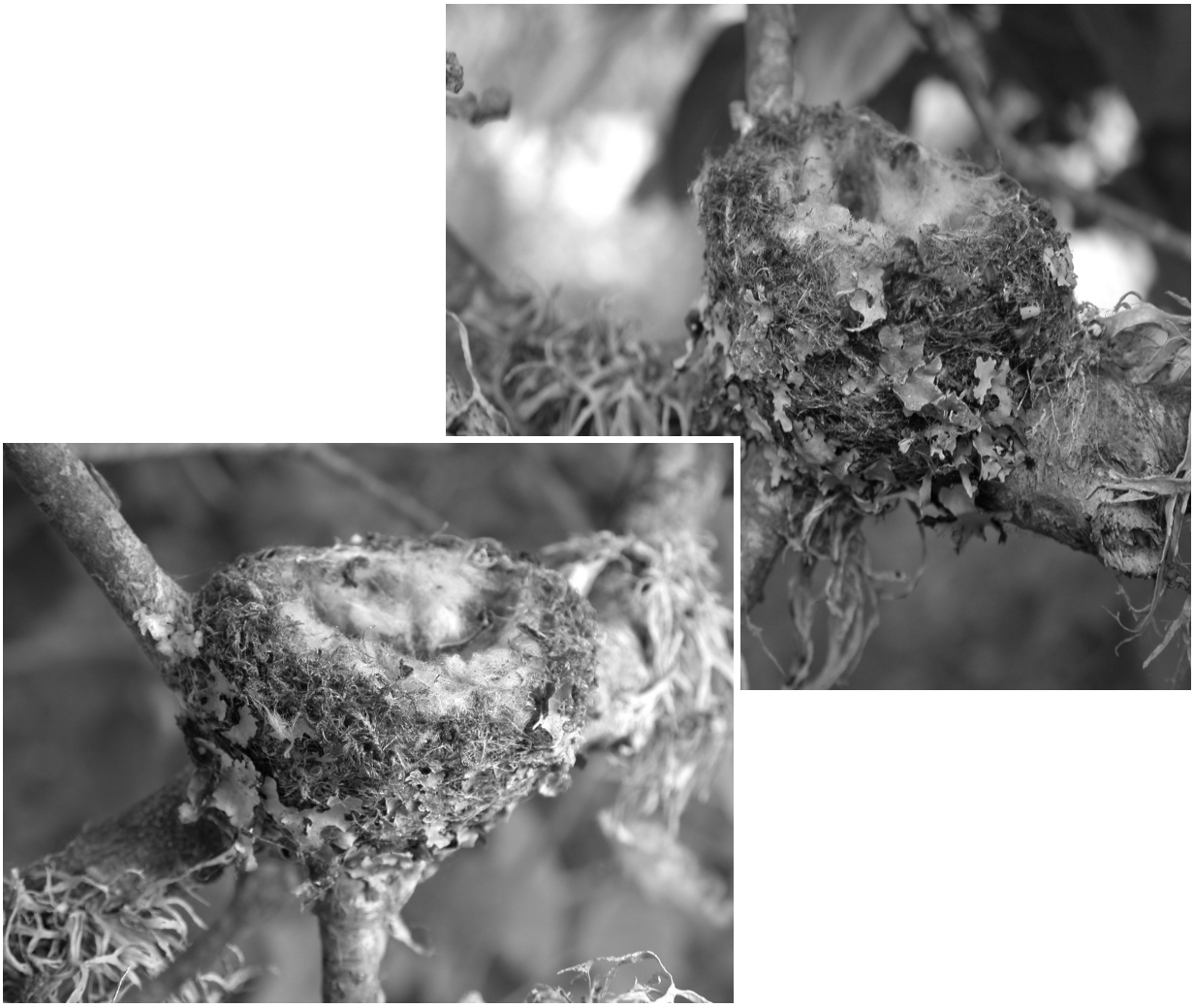
I am always looking for unusual material for the Bulletin, and this winter I felt I had enough similar material to put together a small photographic essay on the uses of lichens by creatures other than lichenologists. I won't spend time here talking about the photos; the captions do a very good job of that. I will say though that if any Society members are also photographers, I would be very interested in hearing from you. I suspect that there's a lot of potential and interest in lichens as part of bird nests...

Here's a bit of lichen mimicry involving a coastal forest, a spider, and some *Parmotrema*, either *P. arnoldii* or *P. perlatum*. Note the *Ramalina menziesii* at the top of the photograph, some *Usnea* in the lower right, and maybe a *Hypogymnia* at the upper right. What an opportunity! Submitted by Doug Glavich, from his work in northern California and Oregon; dglavich@yahoo.com.

Ever since I came to northwest California, I've noticed these small structures on the forest floor, but I've never seen the creature that lives in them. Any guesses? They're always in hardwood/conifer forests where Douglas-fir is the dominant conifer (those of you tuned into such details might notice the type of conifer needle in the construction, and if the detail is good enough you would also be able to see Douglas-fir bud scales at the rim of the tube). This is, however, the first time I have seen this with a lichen incorporated into it - in this case, something from the *Usnea filipendula* group. In both images, the mouth of the tube is about ¾" in diameter. From Campbell Ridge above Willow Creek. Thanks to John McRae at Six Rivers National Forest; jmcrae@fs.fed.us.

Hummingbirds (Anna's?) nesting in a *Magnolia grandiflora* in suburban Walnut Creek, in 2007. Walnut Creek is east of Berkeley. Here's a somewhat flowery quote from *Life Histories of North American Cuckoos, Goatsuckers, Hummingbirds and Their Allies* by Arthur Cleveland Bent (1940) on Anna's Hummingbird. "The nests are large and well made and are usually devoid of camouflage when first built but are decorated with lichens during the incubation period and by the time the young are hatched are very beautiful structures and in my estimation are the most beautiful of all the humminigbird nests." A great moment and a beautiful image, submitted by Jenny Moore; jennymoore@fs.fed.us.

Jenny Hanson acquired this image in 2006 on a rare sunny day on the northwest coast, at the Azalea Reserve in McKinleyville, just above the Mad River. Her timing was perfect for capturing the May azalea bloom, and the lighting and detail on these images worked out really well; note the obvious network of lace lichen (*Ramalina menziesii*) in the enlargement; jhanson@humboldt1.com.



Do hummingbirds always use willow fluff for a nesting material? The hummer nests I've seen in northwest California all seem to always have it, but my experience is limited. As in the other hummer nest featured here, the lichens are oriented with their upper cortices facing outward/upward. I contacted Tamar Danufsky, the Museum Curator and Marine Wildlife Care Center Coordinator at Humboldt State University, and she informed me that hummingbirds, especially Anna's, often use a lot of lichens in their nests. The reason for this is camouflage, so the careful placement of lichens so clearly apparent in the photo is deliberate. This is pretty interesting; maybe CALS needs more birders! Judy Robertson provided this beautiful image; jksrr@aol.com.

Same nest, two views. From the photo taken in the field, it will be obvious to readers with a botanical background that it was found in a tanoak-madrone forest. In fact it comes from Waterman Ridge, above the Trinity River and Willow Creek. It might also appear obvious that the constructor of this nest was more interested in the twigs than the lichens. But in a few years, it might look significantly different. Thanks to John McRae at Six Rivers National Forest; jmcrae@fs.fed.us.

This was taken just a few weeks ago at the Azalea Reserve in McKinleyville, which seems to be a good place to look for nests using lichens. Another call to Tamar Danufsky resulted in a positive identification: "This is an easy one, very unique. It's a bushtit. The entrance should actually be at the top, I assume that hole near the bottom is a tear, if you go back look for an entrance hole near the top, on the side." Tamar was right, as there was a piece of nest material lying in a forked branch below the nest. This nest incorporated *Heterodermia leucomela,* some *Parmelia hygrophila* and *Parmotrema perlatum*. The last one is ubiquitous on hardwoods along the immediate northern coast. Photo contributed by Tom Carlberg.

Chasing Small Cyanolichens

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When I was last visiting the U.S. in July 2008 to join the IAL6 Pre-Congress Tour from Oregon to Monterey, CA and attend the subsequent IAL6 Symposium, two opportunities emerged to further pursue my studies in North American cyanolichens, chiefly Lichinaceae. The first one was an invitation by Bruce McCune to join the "Yosemite Lichen Blitz" he was organizing at that time to be eventually conducted in fall 2009. The second one was that Tom Carlberg and Erin Martin alerted me of the the possibility of applying for a CALS Educational Grant devoted to the study of Californian Lichens. I soon realized that both these opportunities could form an ideal setup for a larger field study – especially since my contributions to the "Lichen Flora of the Greater Sonoran Desert Region" published by Tom Nash et al. had covered only southern California and Californian collections in general were underrepresented among the material that I had studied and partly collected myself. Finally, during the IAL6 Pre-Congress Tour I had gotten electrified by a few discoveries in southern Oregon and northwestern California. So, the initial idea was to conduct a rather broad field trip searching for Lichinaceae in central and northern California and if possible extending that trip into Oregon. However, given the enormous distances to travel and due to family responsibilities that would not allow me to stay away from home for more than 2 weeks I eventually had to reconsider the whole plan. I finally decided to first go for the four day Yosemite Lichen Blitz and then proceed with field work at selected localities making a slow progress from eastern central to southwestern California. The initial plans were to collect Lichinaceae and similar small cyanolichens along an imaginary climatic and elevation transect. This had to be adjusted due to the highly complex climatic and orographic conditions in the state. However, after collecting some 40 species of various small cyanolichens during the two weeks stay, I am still satisfied with the whole endeavor and would like to take the opportunity here to report a short summary of the results as they are already available.

I arrived at San Francisco Airport on Thursday, 17th of September 2009 in the early afternoon after a 12-hour flight from Amsterdam and Hamburg. Before going to Yosemite I wanted to relocate *Zahlbrucknerella calcarea* (Herre) Herre at its presumed type locality, a place called Black Mountain. The collector and author of the species, Albert Herre, was based in the San Francisco Bay Area. Unfortunately, Herre did not provide information exact enough to precisely conclude where he collected this lichen. I found no less then 3 places called Black Mountain, one in Santa Clara Co., two others in Santa Cruz Co. - all of which potentially could be the type locality. However, two aspects lead me to pick Black Mountain on Montebello Rd. near Palo Alto as the presumed *locus classicus*: there is limestone present on top of this mountain and on the slopes just below and Henssen in volume 9 of *The Lichenologist* (1977) reported the species from Castle Rock only some miles south in the Santa Cruz Mountains (unlike the species' name may suggest, *Zahlbrucknerella calcarea* is not only found on calcareous rock but also on volcanic rock). So, after picking up a rental car I hurried towards Black Mountain and started my hike off the parking area on a trail obviously heavily frequented by mountain bikers. I reached the summit of Black Mountain within 45 minutes. There are numerous limestone boulders at the summit pretty much painted black by numerous thalli of a dark brown *Verrucaria* as well as cuhions of *Grimmia* and some cyanolichens such as *Placynthium nigrum* (Huds.) Gray, *Leptogium plicatile* (Ach.) Leight. – but no *Zahlbrucknerella*. The species may actually be present at that place (or perhaps once had been) but the breaking evening did not allow for a more thorough search. It was already half past 6 p.m. and so I had to hurry back and at least found *Peltula euploca* (Ach.) Poelt. and *Koerberia sonomensis* (Tuck.) Henssen on a trailside limestone boulder as well as *Koerberia biformis* A. Massal., *Collema furfuraceum* (Arnold) Du Rietz, *Leptogium teretiusculum* (Wallr.) Arnold and another minutely squamulose, fertile *Leptogium* on an wayside oak tree. That evening I drove east, to just north of Modesto. On the next day – the arrival day for the Yosemite Lichen Blitz participants – I had still plenty of time to go on my own and so I entered

the Stanislaus National Forest in the Sierra Nevada via Bull Creek Rd. east of Coulterville, trying to find the limestone and marble deposits at Bower Cave. In fact I collected some calciphilous cyanolichens such as *Lempholemma botryosum* (A. Massal.) Zahlbr. and small thalli of *Placynthium asperellum* (Ach.) Trevis. on steep shaded boulders in a pine forest. A surprise was the finding of *Psorotichia montinii* (A. Massal.) Forss. on rather exposed, somewhat inclined boulders. This is a rare species but certainly much overlooked because of its very thin, almost powdery blackish crustose thallus and minute apothecia hardly exceeding 0.2 mm in size.

From Saturday, 19th till Tuesday, 22nd of September the Yosemite Lichen Blitz party visited numerous fascinating places across the National Park, and intensive search for those lichens each of the participants was expected to look in particular for revealed a wealth of lichens, including some Lichinaceae, *Peltula*, and *Leptogium* species. The results will be published elsewhere. For crustose Lichinaceae the most interesting finds certainly were three species of *Pyrenopsis* (*P. subareolata* Nyl. [Figure 1], *P. triptococca* Nyl. [Figure 2] and a richly fertile, though yet unidentified species of that genus [Figure 3]), *Pterygiopsis* cf. *concordatula* (Nyl.) P.M. Jørg., and *Psorotichia montinii* (A. Massal.) Forss.

On Wednesday, 23rd I continued my trip and crossed Yosemite eastwards to Tioga Pass. I stopped again at Dana Meadows which we had visited two days before in order to search more thoroughly for semi-aquatic cyanolichens but no additional species except the already collected *Placynthium flabellosum* (Tuck.) Zahlbr., *Ephebe lanata* (L.) Vain. and *E. solida* Born. showed up. Nonetheless, I assume at least two or three further species to be present on splashed boulders along the creeks at that high altitude (above 2,500m) viz. *Thelignya lignyota* (Wahlenb.) P.M. Jørg. & Henssen, *Porocyphus, Pyrenopsis* as well as other species of *Placynthium* such as *Pl. pannariellum* (Nyl.) H. Magn. At Tioga Pass I hiked up to above 3,200m to find lots of high altitude lichens, but not a single cyanolichen. This gave me a first impression of how the dry climate in the eastern Sierra Nevada would allow only a very meager growth of cyanolichens. The different climatic conditions in the eastern Sierra Nevada are also evident from the almost total lack of epiphytes. I stayed for two nights at Valentine Camp of UCNS at Mammoth Lakes, especially looking for lake or creek-side cyanolichens but I did not find anything at, for example, Crystal Lake high above Mammoth Lakes, but *Pyrenopsis sanguinea* Anzi was growing


Figure 1: *Pyrenopsis subareolata*.

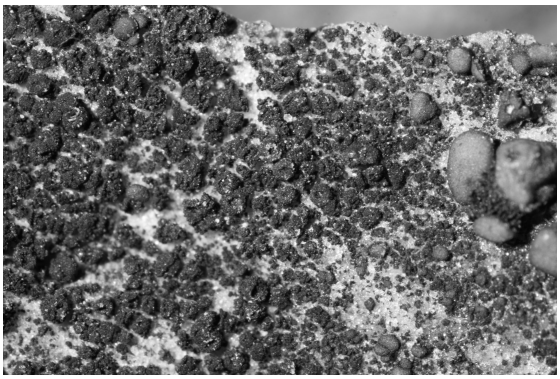
Figure 2: *Pyrenopsis triptococca*.

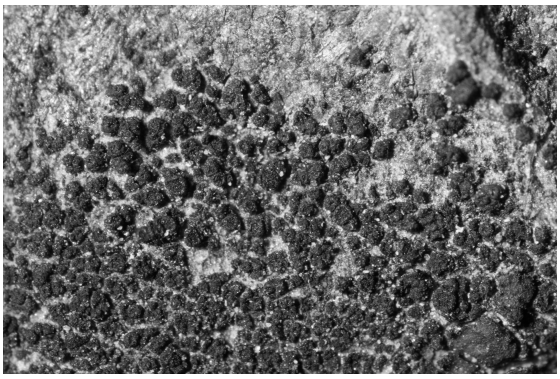
Figure 3: *Pyrenopsis* sp.

in a seepage line at the base of a steep rock wall just below Crystal Lake. I also explored Convict Lake a few miles south of Mammoth Lakes. I did not expect this artificial lake to support any interesting lichen growth, but the creeks running below the towering Mount Morrison did not support cyanophilous lichens either. Instead I found a bunch of aquatic species, mostly *Verrucaria* and *Staurothele*. In the rocky slopes just above Convict Lake, boulders of various rock types were densely covered with colorful lichens (*Acarospora, Caloplaca, Rhizoplaca, Umbilicaria* etc.) - but not a single cyanolichen. I left the Long Caldera Valley towards the White Mountains. I was still hoping to get cyanolichens there because there is lots of calcareous rock (mostly dolomite and some limestone) in these high-rising mountains. But again I did not find any cyanolichens. Instead, high up at the Methuselah Grove in the Forest of Ancients Bristlecone Pines I found the lime pebbles lying on the ground to be covered with *Xanthoria elegans* (Link) Th. Fr. and a few other colorful lichens. Since these did not interest me, I left eastern California southwards via the Owens Valley and entered again the Sierra Nevada to work in the Kern River valley north of Lake Isabelle. I stayed near a campground called Limestone Campground which made me curious again. I wasn't expecting "real" limestone there and indeed found tufa-like boulders beside other igneous rock in a steep slope above the road. Some of the boulders were densely covered with *Peltula euploca* and *P. bolanderi* (Tuck.) Wetmore and "*Peltula spectabilis*" (a working name coined by Burkhard Büdel for a yet not understood form somewhat intermediate between *P. euploca* and *P. bolanderi* having nicely undulating, lobate squamules), *Lichinella nigritella* (Lettau) P. Moreno & Egea and *L. stipatula* Nyl., *Koerberia sonomensis*, *Collema undulatum* Laurer ex Flot. and perhaps *Peccania cernohorskyi* (Servít) Czeika & Guttová. Further north, I followed a trail up the Kern River to find roughly the same species. I turned to the south again, traveling down the scenic valley of the Kern River below Lake Isabelle, crossed the developed region east of Bakersfield, headed again east, and finally reached the Mojave Desert and found accommodation near the northern foothills of the San Bernardino Mountains. Early morning on Sunday the 27th I drove into the San Bernardino National Forest to find *Thyrea confusa* Henssen on steep road cuts. The rock itself apparently was incrusted by lime dust from the nearby quarry at Cushenbury. In the rock clefts where fine lime dust had accumulated I found besides *Toninia* and *Psora* species a small *Anema* or *Peccania*. Further up on Cactus Flat I once more encountered *Peltula euploca* this time accompanied by *Lichinella cribellifera* (Nyl.) P. Moreno & Henssen on granite boulders (in clefts and water runoffs). Further to the southeast on Smarts Ranch Rd. (FR3N03) I found *Collema undulatum* in shaded marble cliffs as well as again *Psorotichia montinii*. For the afternoon of that day I had an appointment with Kerry Knudsen at Wildomar. On the next day we made a joint excursion into the San Jacinto Mountains exploring a mesic chaparral hillside with marble boulders (*Lichinella nigritella, Peccania cernohorskyi*?) as well as the North Fork San Jacinto River, the locality yielding two small species of *Leptogium* both growing on shaded granite boulders and splashed by water at least in spring and early summer. On my last day, Tuesday the 29th of September, I left Wildomar towards the desert. On Road S2 in the Anza-Borrgeo Desert State Park I found a typical desert cyanolichens community in inclined boulders and water runoffs in the north-facing slope of a wash just north of Box Canyon. Again there was *Peltula euploca* accompanied

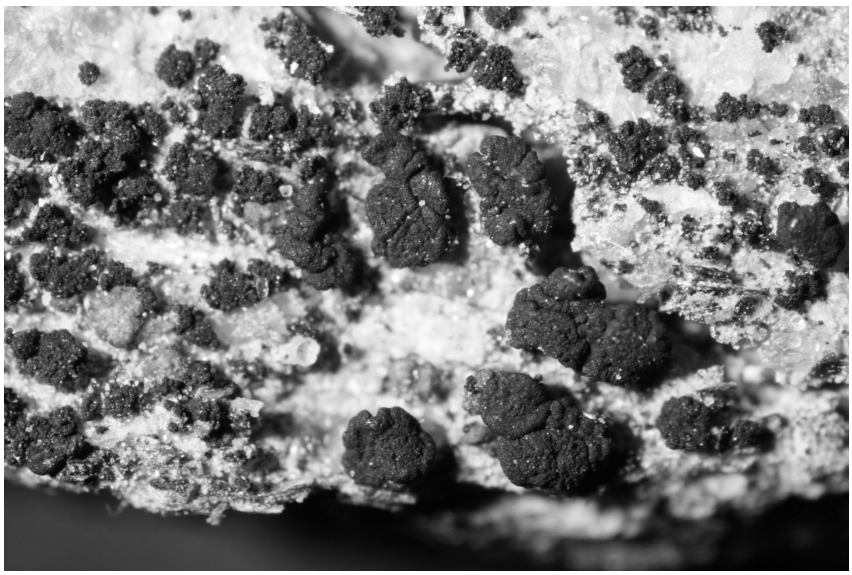

Figure 4: *Lichinella minnesotensis*.

with *P. bolanderi,* abundant *Lichinella nigritella*, *L. cribellifera*, *L. stipatula, L. minnesotensis* (Fink) Essl. (Figure 4), *L. granulosa* M. Schultz and perhaps another small crustose species of the Lichinaceae. This last locality reminded me very much of my work for the Sonoran Desert Lichen Project which had triggered my interest in North American lichens.

Was it worth the chase? Crawling on my knees and ruining my chisels (and knuckles)? It definitely was! I gathered many interesting specimens which I will need to study in detail in the coming months. I also got an impression of how few Lichinaceae there seem to be in eastern California. On the other hand, during a short stay in March 2003 I found two species of *Anema* which are presumably new to North America as well as some other interesting members of the Lichinaceae on limestone boulders in the Mount Charleston region (forest and upper Mohave Desert) northwest of Las Vegas, Nevada… Obviously, much more field work needs to be done in order to get a more consolidated view on the distribution patterns of small cyanolichens in western North America.

To close this short report, I would like to express my gratitude to Tom Carlberg and Erin Martin of CALS for alerting me of the grant program and CALS for making this trip possible. I would also like to thank Bruce McCune for inviting me to the Yosemite Lichen Blitz, Alison Colwell and Martin Hutten for excellent organization and field guidance when in Yosemite, all Lichen Blitz participants for a great, stimulating time and finally Kerry Knudsen for his hospitality and knowledgeable field guidance.

Lichen Holdings at the California Academy of Sciences (CAS)

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Here at the California Academy of Sciences (CAS) we have been in a major upgrading phase of the cryptogamic collections. Since moving back into the new CAS building at Golden Gate Park in the fall of 2008, Phase 1 of this upgrading has now been completed thanks in large part to a cadre of volunteers which expedited the process. The entire CAS bryophyte collection has now been transferred and transformed into the 'palm folder' filing system similar to that used at H and UC. All of the CAS bryophytes are now arranged by family with all of the genera placed in alphabetical order with species folders color coded by geographic regions. The bryophytes previously were filed upright in boxes that fit a herbarium shelf and the packets were arranged in alphabetical order based on the name on the label. The advantages to the palm folder system are many but the obvious one provides a way to file the same taxon regardless of the name used on the label in one place and the palm folder accommodates any sized packet even a specimen mounted on a standard herbarium sheet. All of the related taxa are filed nearby and specimens named only to genus or family can now be readily accessible to researchers working within these groups.

For Phase 2 of the cryptogam collections upgrade, we are considering how best to organize the lichen component of the herbarium at CAS. One option is to continue this upgrade of the lichen collection with the palm folder method and arrange the collection by families. **However, we are seeking advice and suggestions from lichenologists who use herbaria regarding filing systems you have used and features you found most useful.** Contact me at jshevock@calacademy.org within 30 days of receiving this issue of the Bulletin with your comments. Currently, the CAS lichens are placed in sturdy brown boxes that exactly fit the standard herbarium shelf with the packets placed upright like filing cards in alphabetical order based on the name listed on the packet label. Lichen specimens stored in various sized boxes (mainly crustose species) are placed at the end of the collection.

CAS also is in the process of integrating a large lichen and bryophyte collection from the estate of Dr. Hugh Mozingo, former professor at the University of Nevada, Reno. Many of Hugh's collections go back to his days at the University of Tennessee (1950s) so there is a large component of lichens from the Great Smokys and other areas of eastern United States in this collection; in his later years, large collections were obtained from the American West. His herbarium also contained many Herre collections. This entire collection needs to be re-packeted into acid-free archival quality packets. About 100 Mozingo collections are currently being processed and integrated into the collection weekly. As with many collectors, there is also a backlog of specimens needing both identification and labels.

CAS also has a long history of valuing the cumulative scientific efforts by those with a passion for inquiry and documentation of biodiversity through the acquisition of specimens whether for localized floras, checklists, or larger floristic or monographic efforts. Much of the CAS vascular collections over the past 100 years were obtained from 'amateurs' ,'field associates', government and consulting biologists and other collectors not linked directly to academic centers. CAS is actively expanding the bryophyte and lichen collections and would welcome any duplicate labeled specimens obtained from the CALS membership to be added to these collections. We can guarantee that they will be accessioned promptly, be curated to the highest standards, and be readily available for study. Although the CAS lichen collection is not large at present, our goal is to obtain additional collections thereby expanding the lichen component at CAS. We hope that this notice in the CALS Bulletin will increase both the awareness of the CAS lichen herbarium and the availability of its use by the CALS membership. The CAS Botany Department currently has two dedicated visitor work stations with both dissecting and compound scopes available for use for those who would like to utilize the CAS collections during regular business hours, M-F, 8-5. We welcome members of CALS to consult and use this collection. All that is required is to have a day or so notice to ensure that a workspace will be available and reserved for you to meet your needs. Contact the botany department secretary at 415.379.5361 to arrange for a visit.

Lichens on Lichens: a Brief Comment on Substrate Chemistry

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During the course of inventorying coastal lichens for the Friends of the Dunes in Arcata, California, I collected a specimen of *Usnea* that had attached to it a hitchiker. I frequently see thalli of fruticose lichens mixed together, especially where the moving dunes meet the spruce/lodgepole pine forest. At this interface, which receives clean and sometimes stormy winds directly from the Pacific ocean, *Ramalina menziesii* and species of *Bryoria* grow tangled together. I have often separated these specimens so I can perform the chemical tests needed for *Bryoria*, but have not seen two thalli attached to each other.

This is *Ramalina roesleri* growing on a tufted *Usnea*. Apparently usnic acid does not entirely inhibit the growth of fungi that come in contact with it, as this *Ramalina* must have done at some point in its development.

Ramalina roesleri on *Usnea* sp.

The Lichens of Claremont Canyon

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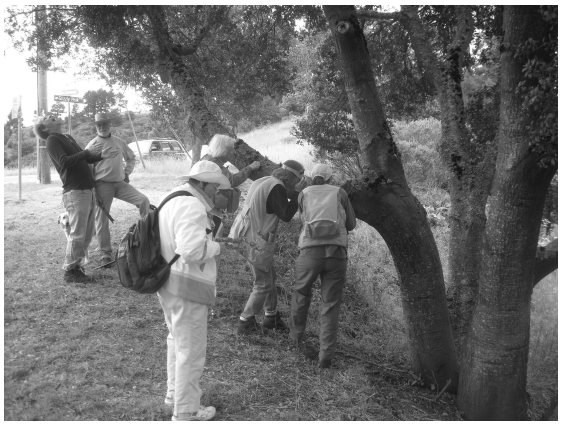
(Note: the summer 2009 Bulletin describes the initiation and development of an informal partnership between the California Lichen Society and The Claremont Canyon Conservancy. This report brings closure to that partnership.)

Adjacent to the southeast section of the University of California's Berkeley campus in Alameda County, the Claremont Canyon is the largest relatively undeveloped canyon on the western slope of the Oakland/Berkeley Hills.

Geologically speaking, this is a lively area. Most of the rocks here originated hundreds of miles to the south, and still continue to move in a northerly direction along faults that define the rift zone between the North American and Pacific plates. Three different geologic formations are represented here, the oldest being the Claremont Formation, which dates back to the late Miocene, 10 to 15 million years ago. This formation is well- represented by the Claremont Chert at Site #2, a large outcrop of massive, laminated gray and brown rock, with beds 10 centimeters thick with thin shale layers between them. Some of the shale contains fossil shells and fish scales, indicating a marine origin. The Claremont Formation is overlain by the riverine Orinda Formation, and the volcanic Moraga Formation (also of Miocene age), represented in the north east end of Claremont Canyon . A complex substrate for lichens indeed!

Turning now from antiquity to today's activities in the Canyon, the Claremont Canyon Conservancy was formed eight years ago to provide a stewardship program for the canyon lands, which are owned by

Overview of a portion of the canyon, showing a fairly typical vegetation composition. Photograph by Bill Hill.



From left to right: Martin Holden and Bill McClung of The Claremont Canyon Conservancy; Irene Winston, Janet Doell, Judy Robertson and Shelley Benson of the California Lichen Society. Photograph by Bill Hill.

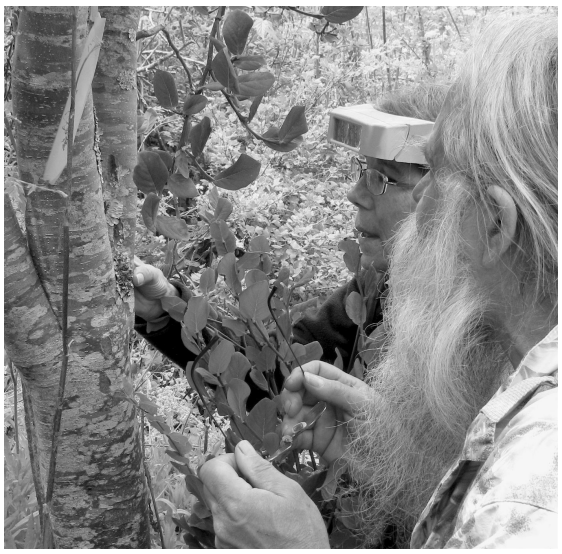
Phaeophyscia orbicularis in the canyon. Photograph by Bill Hill.

the following: The East Bay Regional Park District, UC Berkeley, the East Bay Municipal Utility District, AT&T, the City of Oakland, the Pacifica Foundation, and private properties.

One of the main responsibilities of the Conservancy is to work with these entities to reduce the wildfire risks so prevalent in the East Bay Hills, especially in the fall when the vegetation is dry and the winds are strong. This work consists of creating fuel breaks along the wildland/urban interface, and along ridgetops and roads. Homeowners in the canyon are urged to create defensible space around their structures and to use fire resistant building materials. The three most destructive fires in the East Bay Hills during the last century spread into the Claremont Canyon. UC Berkeley is gradually eliminating the eucalyptus trees on their lands, because the trees are very flammable and once alight become torches, sending airborne brands in all directions.

The Conservancy also has an ongoing program of eradicating invasive plants and facilitating the return of native species, and canyon residents are urged to take measures to protect wild life habitats and to become familiar with the birds and plants in the canyon. As an offshoot of this last interest, after a lichen field guide produced by the California Lichen Society became available, the idea developed to have a lichen survey of the Canyon done by members of the Society.

Over the course of the year the survey was completed. Sixteen locations were surveyed within the complex of land ownerships. Locations were selected in order to encompass as many different microhabitats as possible. Some locations, especially those representing mesic habitats, were small and quite specialized, and represent a tiny fraction of the acreage of the area. Others, such as oak-bay woodland and dry north coastal scrub, represent up to 30% of the lands in the canyon. Overall, the lichens found were predictable, given the terrain, except for three of the species at Site # 16 (*Niebla cephalota*



Judy Robertson and Bill Hill take a closer look. Photograph by Bill McClung.

(Tuck.) Rundel & Bowler, *Heterodermia leucomela* (L.) Poelt, *Topelia californica* P.M. Jorgensen & Vězda), and one species at site #10 (*Thelotrema lepadinum* (Ach.) Ach. which are coastal species and yet were found down near the creek. Brief descriptions of the locations follow. The lichens collected for this study will be accessioned into the Jepson Herbarium at UC Berkeley.

The authors would like to thank Bill Hill, Irene Winston, Shelly Benson, Patti Patterson and Doris Baltzo for their participation in the field and beyond. We would especially like to extend a warm and heartfelt thanks to Bill McClung and Martin Holden, officers of the Conservancy, for the many afternoons they devoted to this project, and their expert botanical and geological guidance.

Survey Locations:

1. Gooseberry Glen. – UC Ecological Study Area. Across the road from the Claremont Chert outcrop on Claremont Avenue, and down the trail from the parking area to a thicket of canyon gooseberry, coffeeberry, and arroyo willows near Harwood Creek – heavily populated with lichens common to the area.

2. Claremont Chert. – UC Ecological Study Area. A large exposed chert formation, once quarried when Claremont Avenue was constructed. Dry, south facing area.

3. Radio Tower. – KPFA driveway. Ridge top driveway on Regional Park District Preserve. Full sun exposure, scattered coyote bush, California sagebrush, madrones.

4. Claremont Avenue at Gelston. – Regional Park District Preserve. Willows, oaks, and eucalyptus near road. Former ranch site, weedy near driveway with up slope northern coastal scrub (xeric) dominated by coyote bush and poison oak.

5. Drury Court. – Private land. Driveway with north-facing open land above and below. Vegetation is rich mix of northern coastal scrub (mesic) with many elderberries, and scattered oaks, damaged by 1991 fire.

6. Four Corners. – UC Ecological Study Area. Southwest corner characterized by a mosaic of grassland, shrubland, and forest (bays, oaks, and redwoods) species.

7. Dirca site (Western Leatherwood). – Mid-canyon, UC Ecological Study Area. Endemic *Dirca occidentalis* is on the CNPS rare and endangered plant list. Here it is present in mature stands of coffeeberry, poison oak, and willows.

8. Redwood Creek Place. – UC Ecological Study Area. Forty-year old redwoods near Harwood Creek. Willows, red-flowering current, cut eucalyptus stumps.

9. Gwin Canyon. – Regional Park District Preserve. Trail down into canyon that burned in 1991. Rich densities of northern coastal scrub (mesic) and grassland flora along trails, with scattered, fire-damaged oaks.

10. Garber Park. – City of Oakland Park. Mostly closed canopy forest (oaks, bays, big-leaf maples) on steep north facing slopes.

11. West end of Side Hill Trail. – Upper-canyon, U.C. Ecological Study Area. Eucalyptus and French broom dominated area.

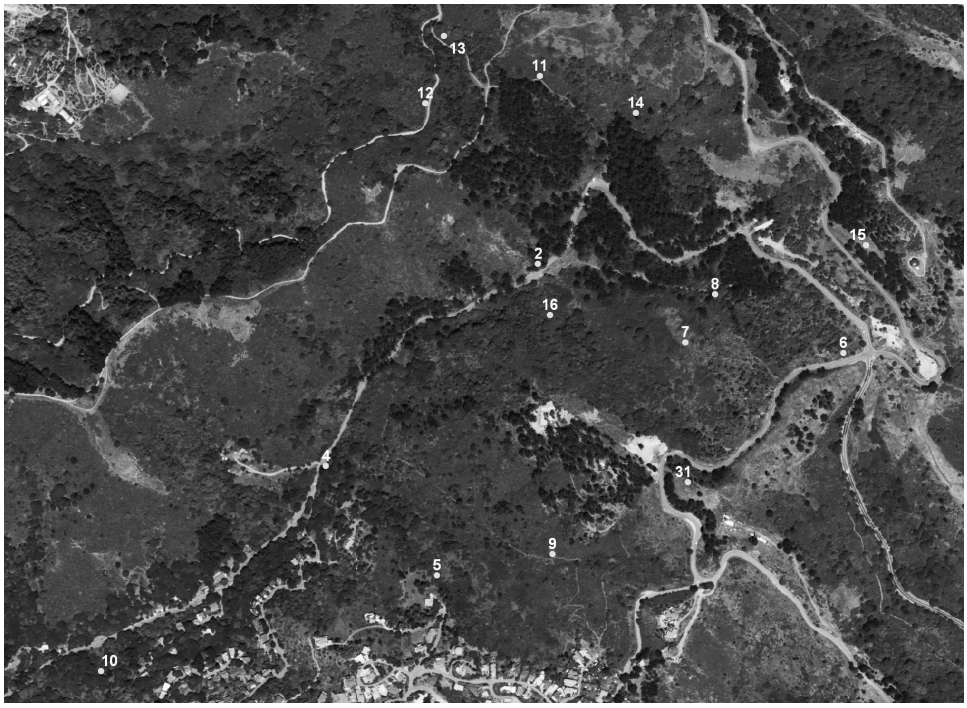
12. East End of Ridge Trail. – Upper-canyon, UC Ecological Study Area. Rich coastal prairie vegetation – scattered coyote bush, California sagebrush, Indian paintbrush, lupine, etc. among scattered basalt in Moraga formation rocks.

13. Rock studded grassland. – West facing bluff near the intersection of the Ridge Trail and the trail coming up from access 2B turnoff.

14. Mixture of pine, bay laurel woodland and eucalyptus near the east end of Ridge Trail.

15. Grizzly Peak – Cross-banded serpentine. On eastern side of Grizzly Peak Blvd.

16. Trail to Creek across from Chert. – Mid-canyon, UC Ecological Study Area. Mostly closed canopy under large oaks and bays near creek. Understory of coyote bush and currents.



Survey location map.

Lichens of Claremont Canyon

Species	Common name	Site number															% frequency
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Acarospora socialis H.Magn.														✓				6%
Arthonia cinnabarina (D.C.)Wallr.	bloody comma lichen										✓							6%
Bacidia heterochroa (Müll.Arg.)Zahlbr.											✓							6%
Buellia punctata (Hoffm.)A.Massal						✓												6%
Candelaria concolor (Dickson) Stein	candleflame lichen																✓	6%
Chaenotheca trichialis (Ach.) Th.Fr.							✓											6%
Chrysothrix candelaris (L.)J.R.Laundon	gold dust lichen										✓						✓	13%
Cladonia chlorophaea group						✓												6%
Cladonia macilenta (Hoffm.)	lipstick powderhorn												✓					6%
Cladonia ochrochlora Flörke	smooth-footed powderhorn					✓										✓		13%
Cliostumum grifithii (Sm.) Coppins					✓													6%
Collema furfuraceum (Arn.) DR	blistered jelly										✓							6%
Collema tenax (Sw.) Ach.	tar-jelly													✓		✓		13%
Diploschistes actinostomus (Ach.)Zahlbr.																✓		6%
Diploschistes muscorum (Scop.) R.Sant.	cowpie lichen															✓		6%
Diploschistes scruposus (Schreber) Norman	crater lichen															✓		6%
Endocarpon pusillum Hedwig	scaly stippled lichen		✓															6%
Evernia prunastri (L.) Ach.	oakmoss	✓						✓	✓								✓	25%
Flavoparmelia caperata (L.) Hale	common greenshield lichen	✓		✓	✓			✓			✓	✓					✓	44%
Flavopunctelia flaventior (Stirton) Hale	speckled greenshield	✓					✓	✓			✓						✓	31%
Heterodermia leucomela (L.)Poelt	elegant centipede																✓	6%
Hyperphyscia adglutinata (Flörke)	grainy shadow crust				✓	✓			✓		✓						✓	31%
Hypogymnia apinnata Goward & McCune	beaded tube														✓			6%
Hypogymnia imshaugii Krog	forked tube			✓						✓								13%
Hypogymnia physodes (L.) Nyl.	monk's-hood														✓			6%
Hypogymnia tubulosa (Schaerer) Hav.	powder-headed tube														✓			6%
Hypotrachyna revoluta (Flörke) Hale	powdered loop	✓		✓			✓											19%
Lecanactis californica Tuck.											✓							6%
Lecanora gangaleoides Nyl.																✓		6%
Lecanora hybocarpa (Tuck) Brodo	bumpy rim-lichen										✓							6%
Lecanora muralis (Schreber) Rabenh.	stonewall rim-lichen													✓				6%
Lecanora pacifica Tuck.	multicolored rim-lichen										✓		✓					13%

Species	Common name	Site number															% frequency
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Lecanora strobilina (Sprengel) Kieffer	mealy rim-lichen														✓			6%
Lecidea atrobrunnea (Ramond ex Lam.D.C.) Schaerer	brown tile lichen															✓		6%
Lepraria membranacea (Dickson) Vainio			✓				✓						✓					19%
Leptogium lichenoides (L.) Zahlbr.	tattered jellyskin									✓								6%
Melanelixia subaurifera (Nyl.) O. Blanco et al.	abraded camoflage lichen							✓										6%
Neofuscelia verruculifera (Nyl.) Essl.																✓		6%
*Niebla cephalota (*Tuck.) Rundel & Bowler	powdery fog																✓	6%
Normandina pulchella (Borrer) Nyl.	elf-ear								✓		✓							13%
Opegrapha atra Pers.											✓							6%
Opegrapha herbarum Mont.											✓							6%
Parmelia sulcata Hale	hammered shield	✓		✓	✓			✓		✓	✓						✓	44%
Parmotrema arnoldii (Du Rietz) Hale	powdered ruffle			✓						✓								13%
Parmotrema perlatum (Hudson) M. Choisy	powdered ruffle				✓		✓	✓			✓	✓			✓		✓	44%
Peltula bolanderi (Tuck.) Wetmore			✓															6%
Pertusaria amara (Ach.) Nyl.	bitter wart										✓							6%
Phaeographis dendritica (Ach.)Müll. Arg.											✓							6%
Phaeophyscia hirsuta (Merecshk.) Essl.			✓								✓							13%
Phaeophyscia orbicularis (Necker) Moberg	mealy shadow lichen				✓		✓				✓							19%
Physcia adscendens (Fr.) H. Olivier	hooded rosette				✓			✓			✓						✓	25%
Physcia tenella (Scop.) DC.									✓									6%
Physcia tribacia (Ach.) Nyl.																✓		6%
Physconia isidiigera (Zahlbr.) Essl.	bottlebrush frost lichen										✓							6%
Punctelia perreticulata (Räsänen) G.Wihl. & Ladd					✓		✓				✓				✓		✓	31%
Punctelia stictica (Duby) Krog	seaside speckleback															✓		6%
Ramalina farinacea (L.)Ach.	dotted ramalina	✓			✓	✓	✓	✓			✓	✓	✓				✓	56%
Ramalina menziesii Taylor	lace lichen	✓																6%
Ramalina subleptocarpha Rundel & Bowler	slit-rimmed ramalina										✓							6%
Teloschistes chrysophthalmus (L.)Th.Fr.	gold-eye lichen									✓		✓						13%
Teloschistes flavicans (Sw.) Norman	podered orange bush lichen			✓														6%
Thelomma mammosum (Hepp.) A.Massal	rock nipple lichen								✓					✓		✓		19%
Thelotrema lepadinum (Ach.) Ach.	bark barnacles										✓							6%
Topelia californica P.M.Jorgensen & Vazda																	✓	6%
Tuckermannopsis orbata (Nyl.) M.J.Lai	variable wrinkle-lichen												✓					6%
Trapelia coarctata (Turner ex Sm.) M.Choisy						✓												6%

Species	Common name	Site number															% frequency
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
Umbilicaria phaea Tuck.	Emery rock tripe															✓		6%
Usnea ceratina Ach.	warty beard lichen												✓					6%
Usnea cornuta Körber	inflated beard lichen							✓										6%
Usnea fragilescens Hav. ex Lynge	inflated beard lichen										✓							6%
Usnea fulvoreagens (Räsänen) Räsänen								✓			✓							13%
Usnea glabrata (Ach.) Vainio	lustrous beard lichen							✓		✓			✓					19%
Usnea rubicunda Stirton	red beard									✓								6%
Usnea wirthii Clerc				✓												✓		13%
Waynea californica Moberg											✓							6%
Xanthomendoza oregana (Gyeln.) Søchting, Kärnefelt & S.Kondratyuk							✓											6%
Xanthoparmelia cumberlandia (Gyelnik)Hale	Cumberland rock-shield								✓				✓					13%
Xanthoparmelia mexicana (Gyelnik) Hale	salted rock-shield															✓		6%
Xanthoria candelaria (L.) Th.Fr.	shrubby sunburst		✓			✓		✓		✓								25%
Xanthoria parietina (L.) Th.Fr.	wall lichen				✓		✓				✓	✓						25%
Xanthoria polycarpa (Hoffm) Rieb.	pin-cushion sunburst						✓	✓				✓			✓		✓	31%
	TOTALS	8	6	8	11	8	12	14	7	9	30	7	9	5	8	15	17	

Under the Lens

Introductory Lichen Walk at the Regional Parks Botanic Garden, Tilden Regional Park, Berkeley January 9th, 2010

A few CALS members had requested an introductory walk to explore the lichens in the Regional Park Botanic Garden of Tilden Regional Parks in the Berkeley hills (not to be confused with the nearby UC Botanical Garden). After announcing this on this yahoo group, more members joined us in this impromptu adventure. So on Saturday afternoon January 9th there were about ten of us, mostly CALS members -- Sara Timby, John Rawlings, Susan Crocker, Lee Gallagher, Kathryn Strachota, Natalie Howe, Nancy Hillyard, Debbi B. joined Bill Hill and Irene Winston for a lichen walk in the California native plants garden. We met at first for a few minutes in the Visitors¹ Center to discuss how for beginners the main exercise would be to notice key characteristics and try with the Doells¹ mini-guides and Brodo/Sharnoff/Sharnoff book to name the species. A couple of other Garden visitors even became interested and joined our group. The Botanic Garden, ten acres, has many lichens on the trees and rock walls that we studied with hand lenses. We observed examples of foliose, fructicose, crustose, squamulose, and leprose lichens, identifying many to genus and some to species. As there could be no collecting or chemical testing in the Garden, we returned to the Visitors¹ Center to examine better and spot test some samples previously brought for inspection and discussion.

The group was interested in continuing explorations at other sessions and we will check with the Garden about the possibility of meeting perhaps monthly to use the available dissecting microscopes in the Visitors¹ Center to key lichen specimens and to continue to explore the lichens in the Garden. This is an example of the kinds of things we CALS members can do to show newcomers to the wonders and appreciation of lichens. We handed out membership brochures for new members, something that should be done at all of our events. We may also in a future excursion, start a checklist for the Garden. This could also develop into another 'workshop series.'

Reported by Irene Winston and Bill Hill.

Yosemite National Park

Yosemite National Park is one of America's most well known and visited parks. For whatever reason, lichenologists have not given it much attention. There has never been an official tally, but prior to 2007, fewer than 100 species were known from the park. Given the sensitivity of lichen communities to declining local air quality, Yosemite initiated a project to catalog its lichen diversity with funding from the Yosemite Fund, and the NPS Centennial Challenge initiative. Our most significant effort in 2009 was a so called "lichen-blitz" held during 4 days in mid-September. The foray was attended by a select group of ten lichenologists with expertise in difficult lichen groups well represented but as yet under-documented in Yosemite. Alan Fryday collected non-corticolous crusts, (esp. *Porpidia*, *Rhizocarpon*), Bruce McCune focused on miscellaneous under-collected groups, Christian Printzen targeted corticolous Lecidioid crusts, and

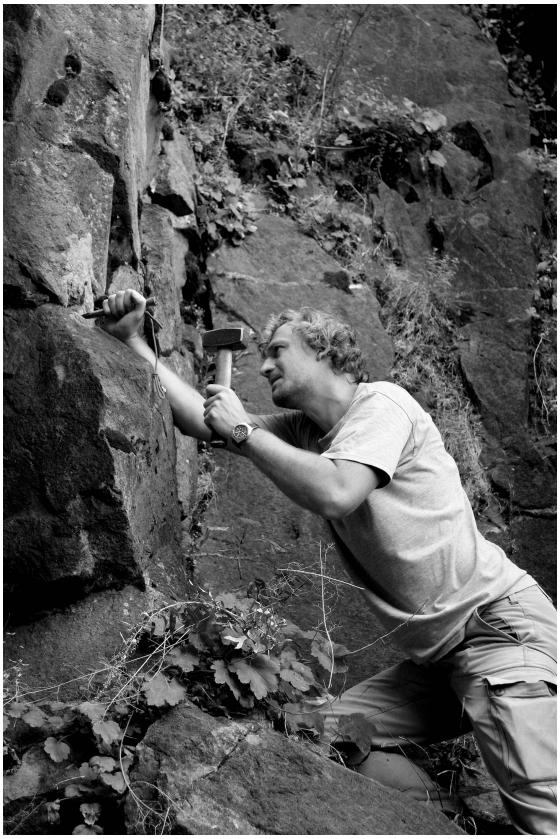
Alan Fryday at Yosemite.

non-saxicolous *Lecanora*), Heather Root focused on *Rinodina* for John Sheard, James Lendemer came for sterile crusts, esp. *Lepraria*, but collected many additional groups, Kerry Knudsen deliberated Acarosporaceae, *Aspicilia*, and lichenicolous fungi, Matthias Schultz negotiated Lichenaceae, *Collema*, *Leptogium*, *Peltula* etc., Ted Esslinger dealt with the Parmeliaceae, Physciaceae, etc.), Ohtmar Breuss claimed the Verrucariaceae, *Dermatocarpon*, and other pyreno's, Ulf Arup addressed the Teloschistales with *Caloplaca* in particular. NPS botanists Martin Hutten and Alison Colwell kept the team fed, watered, safe, legal, and supplied with a string of interesting collection localities. Full results of the effort are not yet available, but are expected to include a number of species new to the Sierra Nevada, and a few species new to California. Yosemite is poised also to kick-off a new project that will set-up baseline monitoring of lichen species communities.

Reported by Martin Hutten

Heppia cf *conchiloba* collected by Martin Hutten at Yosemite.

Physcia stellaris at Yosemite.



Matthias Schultz at the Yosemite.

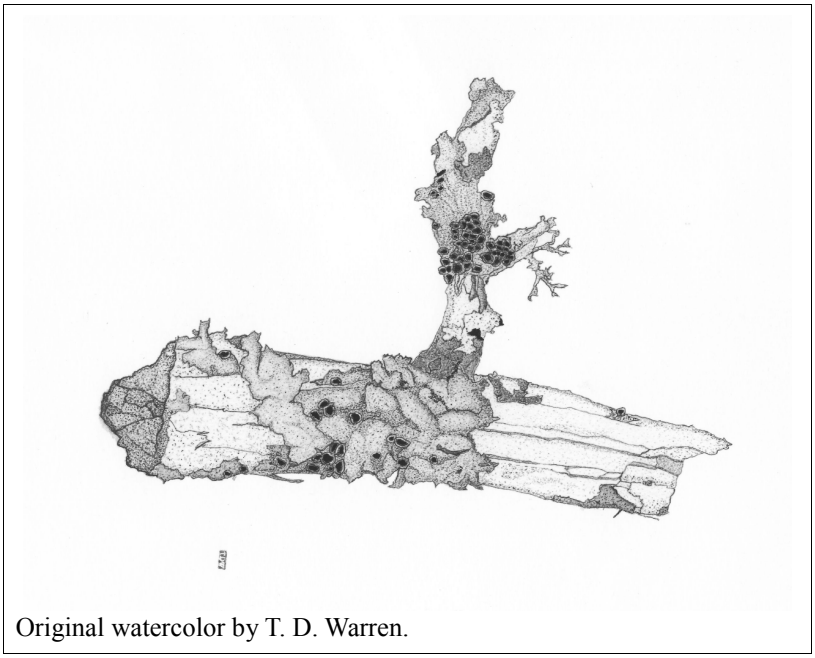
News and Notes

New CALS Webmaster

CALS is very pleased to announce that David Magney has volunteered to serve as Webmaster for californialichens.org, the official CALS website. David is already a member of the Conservation Committee, and is the proprietor of an environmental consulting agency with offices in Ojai and Grass Valley. David responded to an announcement in the Bulletin, contacted CALS President Erin Martin, and we now have great hopes that some much-needed updates to our website will actually take place! Welcome, David!

Watercolor by T.D. Warren

Original watercolor submitted by T. D. Warren, drawn from specimens encountered in the Santa Ynez Mountains above Santa Barbara, at about 2900'. The substrate is chamise (*Adenostoma fasciculatum*). The artist admits to modest taxonomic skills, but based on images from CALS' *Mini-guide to Some California Lichens* (Doell 2002) has assigned the following tentative identifications to some of the lichens: *Parmotrema chinense, Flavoparmelia caperata* and *Parmelina quercina*.



Original watercolor by T. D. Warren.

Many thanks, Dion, and we wonder if many other members have an interest in lichens that involves an artistic expression? I am always open to the idea of publishing photographs, artwork, drawings and paintings, or other visual arts. Drop me a line if you have something of interest. Tom Carlberg, Editor (tcarlberg7@yahoo.com)

CALS Educational Grants

This year the California Lichen Society offered two small grants to support research pertaining to the lichens of California. The educational grants committee is comprised of members who have an interest in education and outreach. This year the committee members were Don Renyolds, Jennifer Riddell, Shirley Tucker, and myself. We are proud to announce that we selected two proposals for funding this year. One grant of $500.00 was awarded to Troy McMullin, a student at the University of Guelph in Ontario Canada, for his proposal "A revision of the lichen Genus *Bryoria* in North America." A second grant for $750.00 was awarded to Steven Leavitt, a student at Brigham Young University in Utah, for his proposal "Assessing Species Diversity and Evolution in Morphologically and Chemically Diverse Communities of the Lichen-forming Genus *Xanthoparmelia* (Parmeliaceae, Ascomycota) in Western United States." Glowing letters of recommendation accompanied both proposals. We are reprinting the introductory segments of these proposals below so that other members can read these portions of the proposals and see the exciting work that CALS is helping to fund. I want to extend my thanks and appreciation to the members of the educational committee and to all individuals who submitted proposals.

Erin Martin

Chair CALS Education Committee, President of CALS

Revising the Lichen Genus *Bryoria* in North America

by Troy McMullin

There are approximately 48 species of *Bryoria* worldwide, 25 of which and four subspecies occur in North America, at least 11 are known from California, including three particularly rare species: *Bryoria subcana*, *B. spiraliferia*, and *B. pseudocapillaris* (Brodo and Hawksworth 1977, Brodo 1986, Common and Brodo 1995, Bystrek and Fabiszewski 1998, Hinds and Hinds 2007, Velmala et al. 2009).

Brodo and Hawksworth (1977) described the lichen genus *Bryoria*. In their monograph, a number of problems were discussed, largely chemical and morphological variations within species. Over the last 30 years, an increasing number of lichen collections have been completed in North America, and this increase in material and knowledge has lead to more questions about *Bryoria* (Brodo Per. Com. 2008). Several studies have indicated that this genus requires revision. Common and Brodo (1995) examined the three species that made up the *Subdivergentes* group, *Bryoria abbreviate*, *B. oregana*, and *B. subdivergens*, and reclassified them into a new genus, *NodoBryoria*. Bystrek and Fabiszewski (1998) designated two new species, *B. ambigua* and *B. fabiszewskiana*, and three subspecies, *B. furcellata* ssp. *hawksworthiana*, *B. trichodes* ssp. *brodoana* and *B. trichodes* ssp. *canadensis*. More recently, Velmala et al. (2009) molecularly compared the two species that comprise the section *Tortuosae*, *B. tortuosa* and *B. fremontii*. They found these species to be conspecific, *B. tortuosa* is now included within *B. fremontii*. The genetic differences between other *Bryoria* species, however, have not yet been examined.

Genetic analyses are currently available that did not exist when the original monograph was written for *Bryoria*. Therefore, the purpose of this project is to test the robustness of species classification in two of four sections in the lichen genus *Bryoria* in Canada and the United States, using a combination of taxonomic evidence derived from DNA, chemical content and morphology. The sections being examined are *Bryoria* and *Implexae*. Species in the section *Divaricatae* appear to be clearly delineated and are not being reviewed. Species in the genus *Sulcaria* will also be examined, as they are morphologically similar to *Bryoria*. In North America, *Sulcaria* appears to be endemic to California and southern Oregon (Brodo and Hawksworth 1977; Brodo 1986; Peterson et al. 1998).

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Assessing Species Diversity and Evolution in Morphologically and Chemically Diverse Communities of the Lichen-forming Genus *Xanthoparmelia* (Parmeliaceae, Ascomycota) in Western United States

by Steven Leavitt

The lichen genus *Xanthoparmelia* (Vaino) Hale includes over 800 species and is particularly rich in morphological and chemical variation; however, species delimitations based strictly on these criteria are often problematic. Preliminary investigations using molecular data clearly indicate that species diversity in *Xanthoparmelia* has been greatly misrepresented. In *Xanthoparmelia* vagrant forms (unattached taxa that grow, persist, and reproduce without attachment to a substrate) represent an intriguing component of many lichen communities in central and western North America. In spite of the wide distribution of some vagrant species, e.g. *X. chlorochroa*, others appear to be threatened with extinction. However, evolutionary relationships between the various vagrant taxa are nearly completely unknown, and species diversity appears to

have been greatly underestimated. The overall goals of this research proposal include the following: 1) estimate a robust phylogenetic hypothesis concerning the relationship of vagrant forms with attached forms of *Xanthoparmelia* in North America, 2) identify divergent lineages of vagrant forms within their North American distribution and 3) evaluate the utility of morphological and chemical characters in defining these taxa.

For this project we will utilize tree-based phylogeny reconstruction methods to evaluate evolutionary relationships of 515 vagrant and attached voucher specimens collected from 208 localities throughout the known distribution of vagrant *Xanthoparmelia* taxa in North America, including over 20 populations along the Pacific Coast. This approach will allow us to effectively identify broad geographic patterns of differentiation and identify distinct vagrant lineages and evaluate the utility of common chemical and morphological characters. Statistical parsimony and Bayesian clustering will be used for population-level inferences. Evaluating population structure within recently derived lineages will aid in determining the utility of morphological and chemical characters for distinguishing species, identifying species' distribution patterns, dispersal barriers, and ecology.

The current sampling includes over 15 putative *Xanthoparmelia* species collected from western North America. However, material representing the only identified population of vagrant *Xanthoparmelia* in California (San Louis Obispo County) has not been collected for molecular work and will be essential to provide a complete view of the evolution of vagrancy in *Xanthoparmelia* throughout North America. Approximately 25 specimens have already been collected from multiple sites throughout California. The additional inclusion DNA sequence data from attached *Xanthoparmelia* species from California will provide data to test putative distributions of common western North American taxa, identify independent lineages, and better understand *Xanthoparmelia* diversity in California.

The proposed research promises to contribute fundamentally to our scientific understanding of evolutionary processes giving rise to vagrancy and diverse chemical and morphological characters in lichenized fungi, and species-level relationships within *Xanthoparmelia*. This research will also provide the first molecular investigation of the most species rich genus in Parmeliaceae, *Xanthoparmelia*. The inclusion *Xanthoparmelia* specimens from California, including the only known vagrant population, will provide important data on species diversity within the State. Voucher material collected for this project will be deposited at the Brigham Young University Herbarium of Non-Vascular Cryptogams (BRY), Provo, Utah. Type-specimens potentially identified through this research will be integrated into the BRY collection, and collections representing divergent lineages will be distributed as part of the Anderson and Shushan: Lichens of Western North America Exsiccate. Where available, duplicate material will be distributed through the American Bryological and Lichenological Association exchange program currently managed by BRY.

Treasurer's Report
12/31/2009

June 25, 2009 Balance (Previous Treasurer's Report)		$	11,729.95
December 31, 2009 Balance			11,038.10
DIFFERENCE IN BALANCE 6/25/2009 – 12/31/2009			-691.85
WELLS FARGO CHECKS CLEARED			
7/29/2009	Board of Equalization, Sales Tax		31.00
9/30/2009	Janet Doell, postage		331.35
10/8/2009	Unique Printing Bulletin (taxed)		1,066.98
12/8/2009	#1001 Steven Leavitt, Ed Grant		750.00
12/15/2009	#1002 Troy McMullin, Ed Grant		500.00
12/16/2009	#1003 Tom Carlberg, outreach NorCalBot		170.00
TOTAL CHECKS CLEARED		$	2,849.33
(Checks not cleared)			
	#1004 Unique Printing - MiniGuide		73.22
	#1005 NCB Outreach – booth		35.00
TOTAL CHECKS NOT CLEARED		$	108.22
CHECK CARD PURCHASES			
7/8/2009	Postage		0.78
7/24/2009	Postage		6.53
10/6/2009	Postage		5.49
10/20/2009	Purchase checks		37.16
11/2/2009	Postage		7.19
12/3/2009	Postage		1.39
12/15/2009	1 Canadian Dep item@ $5 per item		5.00
12.16.2009	Postage		1.66
TOTAL CHECK CARD PURCHASES		$	65.20
TOTAL CHECKS CLEARED + CARD PURCHASES		$	2,914.53
DEPOSITS			
7/10/2009	Membership and gift		120.00
8/20/2009	Memberships		95.00
8/21/2009	Life Membership		550.00
10/6/2009	Memberships		158.95
10/6/2009	Memberships		145.00
10/6/2009	Memberships		40.00
10/15/2009	Memberships		160.00
11/2/2009	Memberships		145.00
11/2/2009	Memberships		20.00
11/2/2009	Memberships		20.00
12/1/2009	Memberships and gift		190.07
12/4/2009	Miniguide Sales		293.66
12/14/2009	Memberships		30.00
12/24/2009	Miniguide Sales		255.00
TOTAL DEPOSITS		$	2,222.68

Upcoming Events

Crustose Lichen Workshop through the Jepson Herbarium of UC Berkeley February 20 – 24, 2010

Taught by Irwin M. Brodo, research lichenologist emeritus at the Canadian Museum of Nature in Ottawa. Location: Bodega Marine Laboratory in Bodega Bay

This lichen workshop will concentrate on the less conspicuous but highly diverse and important crustose taxa. Collections will be made from bark, wood, rocks, and soil, and they will then be identified in the laboratory. Updated keys to genera of crustose lichens from Lichens of North America will be used, as well as other modern keys from the world literature. Techniques for sectioning, staining, and interpreting the tissues of crustose lichen fruiting bodies will be introduced, with special attention being devoted to staining various ascus types with iodine. Thin layer chromatography will be introduced and used to demonstrate how to analyze the chemistry of some crustose lichens, especially sterile species, as the interest of participants and time permits. Techniques for testing lichens with para-phenylenediamine, hypochlorite solution (bleach), potassium hydroxide, nitric acid, and iodine will be discussed and used regularly for identifications.

Course fee ($600/$625) includes meals and accommodations from Saturday dinner through Wednesday lunch. Bring lunch the first day. Lodging is at a field station with two-person rooms, each with a private bathroom. Complete registration information can be found at http://ucjeps.berkeley.edu/workshops/2010/index.html

California Lichen Society Crustose Workshop Stipends

CALS would like to announce that there are 2 small stipends available to cover ½ of the total costs to attend the Jepson Herbarium 5-day crustose lichen workshop with Irwin Brodo, February 20-24, 2010 at the Bodega Bay Marine Laboratory.

Full course fees are $600 for Jepson Herbarium members and $625 for non-members. CALS stipends will cover $300 for Herbarium members or $312.50 for non-members. Participant must pay the other half to the Jepson Herbarium prior to the workshop. Meals and accommodations from Saturday dinner through Wednesday lunch are included. Bring lunch the first day. Lodging is at a field station with two-person rooms; each room has a private bathroom. Please see the workshop announcement elsewhere in this Bulletin for more details.

Stipends will be awarded to those who demonstrate interest in helping expand knowledge of crustose lichens in California, such as writing an article for the CALS Bulletin, leading a field trip and/or writing a subsequent report for the Bulletin, or leading a CALS informal workshop similar to those held at College of Marin. Other ideas are welcome.

Preference given to 1) CALS member, 2) someone demonstrating the potential to understand and learn the material presented, and 3) someone willing and able to help disseminate that information in California by initiating and leading CALS field trips, writing Bulletin articles, giving educational presentations about lichens, presenting and leading lichen workshops, or other similar endeavors.

Apply via email to: cbeyer@fs.fed.us, or mail to: Cheryl Beyer, PO Box 16449, South Lake Tahoe, CA 96151. Include name, address, phone number, email, and a short description of past experience with lichens and how you think CALS would benefit from awarding you the stipend. Applications should describe clearly and specifically the intentions and interests of the applicant, and the institution(s) or events the applicant will provide/promote. Decision on the recipients will be made by the end of January.

Location: Bodega Marine Laboratory, Bodega Bay and surrounding locations. Although the lichens of California's coastal rocks and forest are a conspicuous component of the vegetation, it is usually the larger lichens, the foliose and fruticose species, that attract one's attention. This workshop will concentrate on the less conspicuous, but equally diverse and important, crustose lichens. Collections will be made from bark, wood, rocks and soil, and they will then be identified in the laboratory. Updated keys to genera of crustose lichens from "Lichens of North America," will be used, as well as other modern keys from the world literature.

Dr. Brodo is an emeritus scientist at the Canadian Museum of Nature, in Ottawa, Ontario, Canada. He is a world authority on the identification and biology of lichens, and was honored in 1994 with an Acharius Medal presented to him by the International Association for outstanding

Application # (CALS use only):_____

Application for CALS stipend to participate in Irwin Brodo's crustose workshop

Name: _____

Address: _____

_____

Phone: _____

Email: _____

Please answer the following questions as completely as you can, and return your application via email to shastalichens@gmail.com. CALS members will review these applications using a blind process and will contact you regarding a decision by Feb. 10.

1. Are you currently a member of CALS?

2. Describe any experience with lichen identification that would help you succeed in this workshop.

3. How do you plan to share the information you obtain from this workshop with other CALS members?

4. Are there any barriers that may prevent your attendance to the workshop?

5. Are you able to finance half of the cost of the workshop?

_____ _____

Signed Date

contributions to lichenology. Dr. Brodo's list of publications includes 75 research papers, 8 popular articles, 22 reviews and 6 editorials. One of Irwin Brodo's great achievements was the publication of the 795 page book, "Lichens of North America" which is filled with high quality photographs of lichens taken by Sylvia and Stephen Sharnoff.

This workshop will be held at the Bodega Bay Marine Laboratory in Sonoma County, on the coast at Bodega Bay, California (http://www.bml.ucdavis.edu/). Meals and dorm style lodging will be included. For additional information, please see the Jepson Herbarium website: http://ucjeps.berkeley.edu/workshops/2010/index.html.

Friends of The Chico State Herbarium
California State University, Chico
Introduction to Lichen Identification
March 20, 2010

For most people lichens are only colorful blotches on rocks or just moss-like drapery on tree branches. But lichens are not mosses and they are not plants; they are unique symbiotic associations of fungus and green algae and/or cyanobacteria. Unique organisms, lichens are also essential components of ecosystems through out the world, with more than 1600 species reported for North America. Opportunities to learn about lichens and how to identify them are rare. Friends of the Herbarium present this opportunity to gain skills and understanding of this under studied group of organisms.

This workshop will start in the lab with a lecture presentation covering lichen basics – anatomy, reproduction, ecology, morphology. Lunch will be in the field while seeing lichens in action, possibly with some hands-on collecting. Afternoon will be back in the lab for guided exploration, using dissecting 'scopes, reference materials, and vouchers provided by the instructor. Please bring dissecting tools, a hand lens, and lunch. Participants will benefit more from the workshop if they are experienced with using dichotomous keys.

The workshop will be led by Tom Carlberg. Tom has a degree in Botany from Humboldt State University. He has been a cryptogamic botanist for nine years, working for the Forest Service, private contractors, and non-profit organizations. He is the Editor of the Bulletin of the California Lichen Society (CALS), and a member of the Society's Conservation Committee.

The workshop will meet Saturday, March 20, 2010, from 9:00 a.m. to 4:00 p.m. in Holt Hall room 129 at CSU Chico. The registration fee is $100.00 personal, $125.00 business ($90.00 for members of Friends of the Herbarium). Please register in advance; class size is limited to 16 participants (class cancelled without a minimum of 10 participants). For more information about workshop content please contact Tom Carlberg at tcarlberg7@yahoo.com. For more information about workshop registration please contact the Chico State Herbarium office at (530) 898-3511 or NS@csuchico.edu.

CALS Annual Meeting,
Field Trip,
and Potluck Dinner
Saturday, January 23, 2010

CALS will be hosting our Annual Meeting this year on January 23, 2010. A full day of activities is planned, and anyone may attend any part of the day, or all of it. We begin with a field trip to San Francisco's Presidio. Later in the day will be our customary pot-luck dinner, followed by CALS general meeting, and in turn followed by a talk and photographic slide show by Stephen Sharnoff.

Field Trip to the Presidio of San Francisco. In 1997, when the California Lichen Society was only three years old, seven members of CALS visited the Presidio of San Francisco and conducted a lichen survey. Fifty-one species were recorded, many identified only to genus. No report of this effort was ever published. Flash forward to 2009, when CALS members Tom Carlberg and Cheryl Beyer conducted a lichen workshop for two dozen resource staffers at the Presidio, and took them on a short walk around the grounds. Restoration intern Michael Rotter became interested enough that day to begin an inventory as part of his duties, eventually compiling an independent list of thirty-three macrolichens. In the process he unearthed from the memories and records of Doris Baltzo and Janet Doell a list of species from the 1997 trip.

Starting at 10:00 in the morning, interested CALS members will meet Tanya Pollack of the Presidio Trust on the Presidio grounds. She will escort us to seven or eight different localities, some from our 1997 visit, some from Michael's work, and some suggested by Mark Frey of the Presidio's planning staff. We will carpool from our meeting

point. We will make as many field identifications as possible; no collecting will be permitted.

Directions to meeting place. Map available at http://www.mapquest.com/mq/4-njCy0yJ*R4oy

From the north, cross the Golden Gate and move to the extreme right-hand lane. Approximately 150 feet after the toll booth, turn right onto Merchant Road. Follow Merchant as it curves to the left, and at the intersection with Lincoln, turn right. Pass Ralston Ave. on the left (~200'), pass Langdon Ct. on the right, and turn left into a large triangular gravel parking lot between Ralston and Lincoln.

From the south, proceed north on Park Presidio Blvd, pass through the tunnel, and exit **left** onto Hwy 101 (towards the Golden Gate Bridge). Shortly before the toll plaza (~200'), turn right onto Merchant Road, follow it as it immediately curves right, and right again, where it intersects with Lincoln Blvd. Turn right on Lincoln, pass under Hwy. 101, and then proceed as above.

CALS Board of Directors Meeting. Lichen Society Board Members will then return to the Brickyard clubhouse for our meeting, starting at 3:00pm. We will stop at 5:00pm, when the potluck dinner will commence.

Potluck Dinner. I believe the dinner is self-explanatory; please bring a dish and something to drink. After dinner we will have our general meeting.

Special Guest Presentation by Stephen Sharnoff. This year Stephen Sharnoff has graciously consented to present a talk, and a show of his incredible images of lichens. I would be surprised if there are any CALS members who have not seen some of is photos already, since they are an integral part of two of the most useful books for identifying lichens in California. I am referring to *Lichens of North America*, by Brodo, Sharnoff & Sharnoff, and *Macrolichens of the Pacific Northwest*, by McCune & Geiser. His images also appear on several lichen websites, and in Larry St. Clair's *Common Rocky Mountain Lichens*. Be prepared to view some beautiful lichens!

Directions to Brickyard Landing Clubhouse.

From Marin: Drive east on 580 and come across the San Rafael-Richmond bridge. Take the second exit, Canal Blvd., and turn right or south onto Canal. Continue on Canal about half a mile until the divide in the road ends and the road narrows and bends slightly to the right. Slow down and look carefully for Seacliff Drive which heads off to the right. Head up over the hill and stay on this road (Brickyard Cove Rd.) past one stop sign. You will soon come to a group of five large condominiums on your right. Drive in at the main entrance on Brickyard Way, turn right almost immediately onto Brickyard Cove Lane, drive past the tennis courts and park. Enter at the swimming pool gate. The clubhouse is straight ahead.

From the East Bay: Drive west along 580 to Canal Blvd., turn left onto Canal and proceed as above.

President's Message

Happy New Year! I hope that all of you had a joyous holiday season and wish you the best of luck in the coming year. I have always loved the holidays because they bring friends and family together allowing us to share our lives in meaningful ways. I am very proud of the work that CALS members do and always share the accomplishments of CALS with my family. Our members remain dedicated to advancing the CALS mission: to promote the appreciation, conservation, and study of lichens. Because we are a large and growing group, I think it is important to share our accomplishments and our hopes for the year to come.

As our members search for lichens throughout the state, they make significant contributions to our knowledge of these organisms in California. Each year CALS members collect and describe lichens new to California. Field trips are a great way to keep our group active and to promote our mission. More and more field trips are popping up around the state as members become more involved and the weather begins warming up. Remember, you don't have to be a lichen expert to lead a hike, all you need is a passion for lichens and the willingness to organize a group in your area.

There are currently nine species listed as "Special lichens" in the California Department of Fish and Game Natural Diversity Database (http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/SPPlants.pdf). We owe these listings mainly to the members of the CALS conservation committee and their collaborations with biologists and botanists in both state and federal agencies. Because of their hard work, lichens are now receiving attention during land management activities.

In the past two years, the CALS education and outreach committee has approved four people to receive educational grants towards lichen research in California. This year, we are also planning to support member participation in the crustose lichen workshop that will be held by Irwin Brodo on Feb. 20-24 at the Bodega Bay Marine Laboratory. We hope that members who attend will share the knowledge they gain from this workshop with others through additional workshops, field trips, or by contributions to The Bulletin.

Several of our members routinely volunteer their time to CALS by contributing to the Bulletin, participating in events such as the Fungus Faire, promoting lichen education and conservation at the Northern California Botanists symposium, leading bimonthly workshops at the College of Marin, leading field trips, and by representing CALS at various events throughout California. I would like to personally thank all members who participate in these events. Efforts like these keep our society active and allow for us to grow. I hope that many of you were able to attend this year's annual meeting. We were able to conduct field trips and got to view a presentation on California lichens by renowned photographer Stephen Sharnoff. Thank you Stephen for your wonderful presentation.

In closing, I want to remind everyone about the California Lichens yahoo group. We use this group to keep in contact with one another and announce upcoming events. If you are not a member already, you can join by searching for the group on the yahoo site and then setting up an account. Also anyone can contact board members by emailing cals-board@yahoo.com. Please let us know if you have any ideas for CALS projects or are willing to volunteer in any way.

Best wishes and Happy lichenizing!

Erin Martin
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The Bulletin of the California Lichen Society

Vol. 16, No. 2 Winter 2009

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The deadline for submitting material for the Summer 2010 CALS Bulletin is 15 May 2010.

Back cover:

A) *Thamnolia vermicularis*; see article page 21. Photograph by John and Susan Wolf.

B) *Pyrenopsis subareolata*; see article page 34. Photograph by Mathias Schultz.

C) Lichen survey at Claremont Canyon; see article page 40. Photograph by Bill Hill.

D) Claremont Canyon. Photograph by Bill Hill.

E) Alan Fryday at Yosemite; see article page 42. Photograph by Martin Hutten.

F) *Heppia* cf *conchiloba* at Yosemite; see article page 42. Photograph by Martin Hutten

G) Watercolor by T. D. Warren; see page 48.


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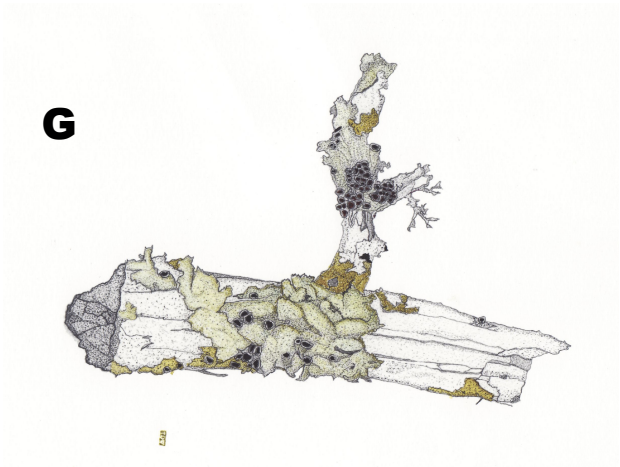
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