Bulletin

of the

California Lichen Society

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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, P.O. Box 472, Fairfax, CA 94930. 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.

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

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Front cover: IAL collage, including Merrill Hall, Judy Robertson eyes *Xanthoria pollinarioides*, the CALS booth, and a background of *Ramalina menzeisii*. Photography by Eric Peterson.

Bulletin of the California Lichen Society

VOLUME 15 NO. 2 WINTER 2008

Report on the 6th IAL Symposium and ABLS Meeting

Janet Doell
1200 Brickyard Way #302
Pt. Richmond, CA 94801
jkdoell@sbcglobal.net

A wonderful experience was made available to California lichenologists this past summer when the International Association of Lichenologists chose California for their first meeting ever to be held in the United States. The Asilomar Conference Center in Ocean Grove, near Monterey, was a perfect venue for such a gathering. The organizing committee, ably led by Tom Nash of the Arizona State University in Tempe, Arizona, kept the 320 attendees busy all the days and most of the evenings as well. Lichenologists and would be lichenologists came from all over the world to listen, talk, and drown themselves in the sea of information which was roiling around them.

Informal contact with these representatives of different countries was enabled by the way the dining room was organized. Seating was always open, and if you chose to sit at a table with strangers they were no longer strangers by the end of the meal. The food was good, too, and very efficiently served. The presence of the ocean right across the street, and for some of us the large and beautiful swimming pool offered way more recreational activities than anyone had time for.

An amazing number of countries were represented in the symposia and posters which were presented by the participants. It seemed right and proper, as the host country, for the United States to lead the list, with 50 presentations. It is interesting to see the number of countries and their contributions, which are laid out in Figure 1.

Having determined that I was right about there being a lot of countries contributing to this gala occasion, now let's try to get some picture of what subjects were covered in the course of these five days. Combining the posters and the symposia, as they were in the abstracts list, there were 256

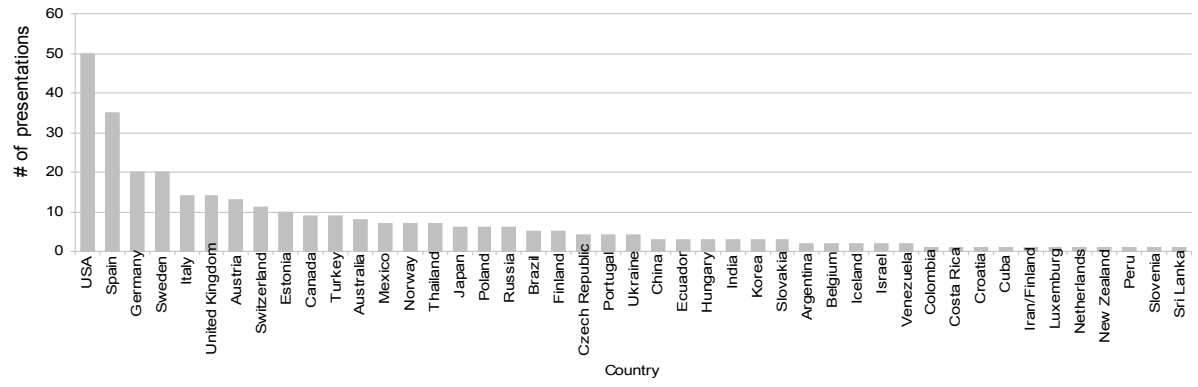


Figure 1. Number of IAL6 presentations by country.

presentations. In the space allotted, I can only touch on a few of the subjects discussed, but the following list will at least hint at the breadth of investigative reports given.

Figure 2. Janet Doell, CALS founder, with parts of the society's display in the background. Photograph by Michelle Caisse.

- Isolation and characterization of non-phototropic bacterial symbionts of Icelandic lichens. Poster. Iceland.
- Vita interrupta: life that tolerates desiccation. Symposium. USA.
- Geographic structure of fungi and algae in a widespread lichen of western North America. Symposium. USA.
- Decoding symbiosis: sequencing the genomes of the lichen *Cladonia grayi.* Symposium. USA
- The carbon balance of tropical bryophytes and lichens: Carbon exchange and carbon pools along an altitudinal.
- Gradient from lowland to cloud forest in Panamá. Symposium. Germany.
- Non-photosynthetic bacteria associated to cortical structure on *Ramalin*a and *Usne*a thalli from Mexico. Poster. Spain.
- A century of logging and forestry in a reindeer herding area in northern Sweden. Symposium. Sweden.
- Preliminary study on possible distribution of tropical lichens under climate change. Poster. Thailand.
- "Invasive" or "in phases" -- how is the Galapagos lichen flora changing? Poster. Ecuador.
- *In situ* analysis of lichen-associated bacterial communities. Symposium. Austria.
- Digital flora of the Swiss lichens: Interactive keys on a web-based access system. Poster. Switzerland.
- Niche partitioning in Alectorioid lichens: The role of physiological response patterns. Symposium. Canada.
- New systematics and generic circumscription of parmelioid lichens inferred from multigene analysis provided by PARSYS-08. Symposium. All or nearly all countries participating.
- Lichen photobiont diversity under changing pollution regimes. Symposium. UK.
- A three-gene phylogeny of the order Arthoniales. Poster. Luxembourg.
- Distinguishing lichen species and genera using ITS2 nrRNA sequence- structure. Poster. China.
- Biotransformation of sesquiterpenes into essential oils by lichen mycobionts. Poster. Japan.
- Toxic cyanobacteria in lichens. Poster. Finland.
- "LIAS light" -- an online identification tool for lichens. Poster. Germany/USA.
- Paternity analyses reveal multiple mating events in apothecia of *Lobaria pulmonari*a. Symposium. Switzerland.
- *Xanthomendoza borealis* -- a bipolar lichen. Poster. Denmark.
- Usnic acid production by culture of lichen-forming fungus of *Usnea longissim*a. Poster. Korea.
- Gene flow in photobionts of the Parmeliaceae: hitch-hiking with soredia. Symposium. Canada.
- Toxic effects of two arid climate pollutants, ozone (O3) and gaseous nitric acid (HNO3) on two lichen species in the Los Angeles air basin. Symposium. USA.
- Lichens of Arasbaran Forest, NW of Iran. Poster. Finland and Iran.
- Lichen and bryophyte signatures in 450-420 million year old biological soil crust-like fossil associations. Symposium. USA.
- Gathering, maintenance and analysis of data on lichen diversity in southern Africa. Poster. Germany.
- A taxonomic study on the lichen genus Lecanora in Western China. Poster. China.

Finally, let's see what some of the participants had to say about the impressions of IAL6 that they took home with them:

IAL6 Letters

Adriano Alfonso Spielmann, Instituto De Botanica, Sao Paulo, Brasil

This was the first time I had ever attended an IAL meeting and I hope that it will not be the last. It was a major experience in my lichenological life, to see, to meet, and to talk with so many people I know from the literature in such a calm place as Asilomar. Lichenologists form a big family, and everyone I met was kind and helpful. Also we learned a lot in these few days, more probably than in years working alone. There is not doubt that the organizers of this event deserve our congratulations for this wonderful conference, which will remain indelible in the minds of all participants.

Larry St. Clair, Brigham Young University, Provo, Utah

For me IAL6 was almost a three-week experience! Steve Leavitt and I arrived in the Bay Area one week before Asilomar in order to finalize the logistics for our pre-conference Point Reyes field trip. Our Point Reyes planning team also included Lawrence Glacy and Judy and Ron Robertson. We spent four wonderful days collecting at various locations in Marin County - with an emphasis on Point Reyes National Seashore. We also spent one day collecting in Sonoma County, where we were treated to lunch and a series of wine tasting opportunities.

The week long meetings at Asilomar were both informative and filled with wonderful opportunities to interact with lichenologists from all over the world. The lectures were engaging and interesting-even if almost every session lost track of time. Everyday there was a new round of lichen-related topics complemented by a host of fascinating posters. The talk about lichens could be found everywhere from the lecture hall to the dining hall to informal gatherings in the registration hall, along the beach and into the night in participants' rooms. It was an incredible opportunity to totally immerse ourselves in lichenology.

During the third week Steve and I traveled with Tom Nash's Parmeliaceae workshop to Albion along the northern California coast. It was another opportunity to totally immerse ourselves in one of the largest and most diverse families in lichenology. We were privileged to be taught by some of the world's leading experts

All in all it was an incredible three weeks - good discussions, good collecting, but mostly good friends.

Jennifer Riddell, Arizona State University, Tempe, AZ

I enjoyed the conference tremendously. What was especially beneficial was the opportunity not only to meet people whose work I had read, but also friends in the field that I rarely see. Likewise, being able to bounce ideas around a group of lichenologists is a rare thing, to be appreciated. This was my first time at an IAL meeting, and it was a real pleasure to see so many lichenologists in the same place. I know this is all cliché, but nonetheless, true. When you work in a very specialized field, there's a quality of isolation in the work, and it's quite fun to feel the opposite for a week.

Figure 3. Merrill Hall on the Asilomar grounds, where most of the conference took place. Photography by Michelle Caise.

Irwin (Ernie) Brodo, Canadian Museum Of Nature, Ottawa, Ontario, Canada

The International Association for Lichenology meetings, held every four years, are always exciting and gratifying. These days, it is really the only occasion where lichenologists from all over the globe gather to discuss their research and renew acquaintances (putting faces on the names that appear on articles). The meeting in the Monterey Peninsula of California last July was special for all those reasons, and more. It was the first time the IAL had

met in North America since it was founded in 1969 at the International Botanical Congress in Seattle, and so there were more North and Central Americans (and even South Americans) participating than usual. Those attending seemed to be unusually young (or am I getting old?), but full of energy, enthusiasm, and, most importantly, knowledge! How did they learn so much so fast? It was extremely encouraging to hear all the excellent papers and to see participants so actively seeking species of special interest to them in the field. It was clear that field work still has a very special place in the hearts of lichenologists , and California, with its scores of endemics, didn't disappoint anyone looking for rare and unusual taxa. The welcome everyone got from the local societies, the CALS and the NWL, was simply outstanding. Even with all the careful planning by IAL6 Chairman, Tom Nash, it was the efforts of all those local volunteers and field trip leaders that made the California experience so wonderful. As always, I learned a great deal about lichens both on the trips and in the sessions, and it demonstrated to me, if not to all the participants, that IAL meetings are something not to be missed if you're interested in lichens.

Figure 4. Rosmarie Honegger, after her presentation "The private life of lichen-forming ascomycetes: reproduction in focus". Photography by Michelle Caisse.

Katherine Glew, University Of Washington, Seattle, Washington

It was an exciting time! I always enjoy the IAL meetings because some of the attendees I only see every four years. It was thrilling to see so many lichenologists on US turf. As much as I like traveling abroad to these meetings, it was exceptional to have the group at Asilomar. And as I always collect lichens from every tree and rock in another country it was fun to see many lichenologists finding our local trees and rocks equally interesting. Of particular interest to me are the systematic/taxonomic papers and posters. The meeting is a great way to keep up on the taxonomy and range extensions of lichens. The papers presented were very stimulating. Always so much new information and terrific research. Five days of lichen talks was amazing. Everyone was so friendly. Lichenologists are wonderful people. And the food was great!

Dana Ericson, Seattle Lichen Guild, Issaquah, Washington

The combined meeting of the ABLS and IAL powerfully reconfirmed to me the importance of Lichen Study. From the field person providing habitat information and location patterns worldwide to the clade developer using up to date methods and thoughtful approaches, it is all important. In addition, the gathering at Asilomar provided a mix of culture, gender, and thoughtful approaches, it is all important. In addition, the gathering at Asilomar provided a mix of culture, gender, and generation. What an amazing and monumental experience!

Louise Lindblom, University Of Bergen, Bergen, Norway

I would like to express my sincere thanks for the work that you put in before and during the IAL conference at Asilomar this summer. I can only imagine the amount of work and time that the members have invested and I am impressed. I had two specific goals for the U.S. trip and one of them was to find the "mystery lichen" of CALS in the field--which we did! And when I came to Asilomar subsequently and saw your display with *Xanthoria pollinarioides* (see photo elsewhere in this Bulletin) in a central position - I was touched and proud. I now understand that the species is not extremely rare (but

not entirely common either) and that you guys will look after this little endemic in the best possible way. (Ed.: *Xanthoria pollinarioides* L. Lindblom & D. M. Wright was discovered by CALS member Greg Jirak and subsequently studied and named by Louise Lindblom and CALS member Darrell Wright.)

Jurga Motiejunaite, Institute Of Botany, Vilnius, Lithuania

One more symposium has ended. Though every meeting is different, the one at Asilomar was definitely new. Starting with the fact that it was the first one to take place outside Europe. The other thing is the outstanding place of the event - the spectacular coast of northern California with its rich plant and animal life. The informality together with the close-to-nature atmosphere was unique. It was the first time during the IAL that you could grab a cuppa and just sit and listen to the presentation munching on a cookie. Regardless of the relaxed atmosphere there were many interesting research reports: to hear or to see them was worth coming all the way to California. For general ecologists and herbarium curators like me, it is always valuable to hear about novelties in taxonomy. There were several discussions on worldwide questions: Conservation, Global change, air pollution and the Phylocode. As most of these problems provide enough material for a full conference, an hour for talks was apparently not enough. Although several worthwhile ideas were voiced and questions asked, some of them were left unanswered due to lack of time or enthusiasm. Still, the questions that were asked may trigger further discussion or even wide scale projects. The fact that we were gathered in a relatively small and isolated place would have helped a lot for making new acquaintances and renewing old ones. But there is always a spoonful of tar to spoil a barrel of honey, as they say in my country. The program was so overloaded that there was virtually no time or energy left to meet with colleagues to discuss, to reminisce about things or whatever. Also, there was no place set aside for such meetings. However, the problem of program overloading is not unusual. Summing it all up, this was one more very successful and highly enjoyable lichenological meeting. Many thanks are due Thomas Nash and his numerous collaborators for this interesting, pleasant and warm (though not in the sense of the weather) meeting.

California Lichens by County
Compiled from Field Trip Reports in the Bulletin of the California Lichen Society

Tom Carlberg
1959 Peninsula Drive
Arcata, CA 95521
tcarlberg7@yahoo.com

Janet Doell
1200 Brickyard Way #302
Pt. Richmond, CA 94801
jkdoell@sbcglobal.net

The first issue of the Bulletin of the California Lichen Society came out in the summer of 1994, but contained no field trip reports. The Winter 1994 issue had reports from two trips, and a total of 84 species reported. Since then, the Bulletin has published 14 volumes in 29 issues. The field trips sponsored by the Society have resulted in 2,170 observations and reports of lichen species, with a total of 739 unique species recorded. The updated Tucker & Ryan checklist (2008) documents 1,690 species. The CALS reports comprise 44% of this exhaustive list.

CALS has conducted formal field trips to to 25 of 58 counties in California (Figure 1), including two islands. The survey intensity varies wildly from county to county, with an apparent emphasis on the coastal counties. Obviously, looking at data in this fashion is a good way to misunderstand what has taken place in the state, since many counties have been visited only once, at a single small area, while others have been visited many times.

Figure 1. California counties where field trips have taken place. The shades of gray represent the number of lichen species reported from that county. The lightest gray is for fewer than 75 species reported; the middle gray is for 76 - 150 species, and the dark gray is for more than 150 species reported.

Another limitation is that lichen nomenclature has changed dramatically in the past fourteen years, but no attempt has been made in this list to update names from their reported original. Similarly, while large numbers of these reports have vouchers in herbaria, this list does not attribute reports to either collectors or voucher specimens with collection numbers, since field trip reports were seldom structured rigorously. With that in mind, here is a list of all of the lichens that have been reported from CLS field trips since 1994; I'm sure you'll find some interesting species here.

Alameda County
Buellia badia
Caloplaca bolacina
Caloplaca cerina
Caloplaca impolita
Cladonia pyxidata
Dermatocarpon americanum
Diploschistes scruposus
Evernia prunastri
Flavoparmelia caperata
Flavopunctelia flaventior
Heterodermia leucomela
Hypotrachyna revoluta
Lecanora muralis
Lecidea atrobrunnea
Parmotrema chinense
Peltula bolanderi
Phaeophyscia hirsuta
Physcia adscendens
Physconia enteroxantha
Physconia isidiigera

Placidium squamulosum
Pleopsidium flavum
Punctelia perreticulata
Punctelia stictica
Ramalina puberulenta
Scoliciosporum sarothamni
Tephromela atra
Thelomma occidentale
Umbilicaria polyphylla
Xanthoparmelia mexicana
Xanthoparmelia novomexicana

Contra Costa County
Acarospora socialis
Anisomeridium biforme
Arthonia pruinata
Arthopyrenia lyrata
Aspicilia cinerea
Buellia badia
Caloplaca brattiae
Caloplaca citrina
Caloplaca ludificans
Caloplaca luteominia
Caloplaca marina
Caloplaca variabilis
Candelaria concolor
Candelariella terrigena
Catapyrenium psoromoides
Cladonia cervicornis
Cladonia furcata
Cladonia macilenta
Collema tenax
Cyphelium tigillare
Dermatocarpon intestiniforme
Dermatocarpon luridum
Dimelaena radiata
Dimelaena thysanota
Diploicia canescens
Diploschistes muscorum ssp. *muscorum*
Endocarpon pusillum
Evernia prunastri
Flavoparmelia caperata
Flavopunctelia flaventior
Gyalecta herrei
Gyalecta jenensis
Hypogymnia physodes
Hypotrachyna laevigata
Lecania brunonis
Lecanora demissa
Lecanora gangaleoides
Lecidella asema
Lecidella elaeochroma
Letharia vulpina
Lichinella nigritella
Lobothallia alphoplaca
Melanelia panniformis
Melanelia subaurifera
Niebla cephalota
Niebla combeoides
Niebla homalea
Niebla laevigata
Ochrolechia subpallescens
Ophioparma rubricosa

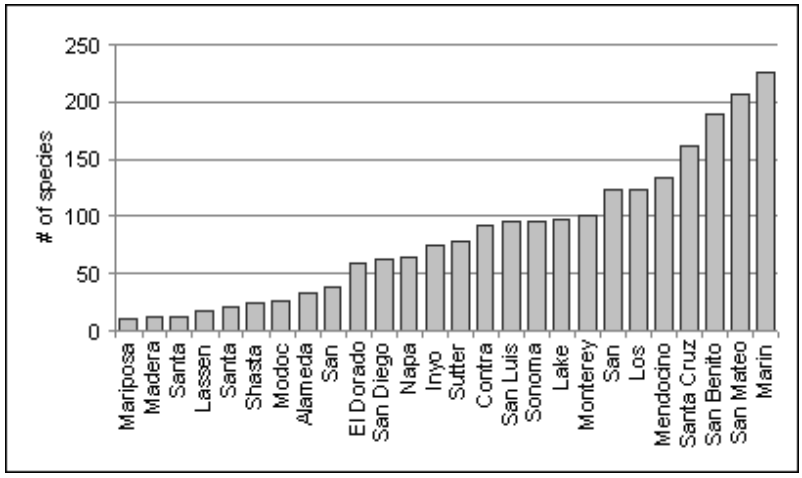


Figure 2. Numbers of species reported for given counties.

Parmelia sulcata
Parmeliella cyanolepra
Parmelina quercina
Parmotrema chinense
Peltigera canina
Peltigera membranacea
Peltula obscurans var. *hassei*
Physcia adscendens
Physcia tribacia
Physconia isidiigera
Placidium lacinulatum
Polychidium muscicola
Psora decipiens
Punctelia subrudecta
Ramalina farinacea
Ramalina fraxinea
Ramalina leptocarpha
Ramalina menziesii
Ramalina subleptocarpha
Sarcopyrenia bacillosa
Sigridea californica
Staurothele areolata
Stereocaulon intermedium
Tephromela atra
Thelomma californicum
Toninia ruginosa
Toninia sedifolia
Trapelia coarctata
Trapelia involuta
Trapeliopsis californica
Trapeliopsis flexuosa
Trapeliopsis granulosa
Trapeliopsis steppica
Tremolecia atrata
Verrucaria maura
Verrucaria muralis
Waynea stoechadiana
Xanthoparmelia cumberlandia
Xanthoparmelia mexicana
Xanthoria candelaria
Xanthoria parietina
Xanthoria polycarpa

El Dorado County
Acarospora bullata
Acarospora fuscata
Ahtiana sphaerosporella
Aspicilia caesiocinerea
Bryoria fremontii
Buellia punctata
Caloplaca cerina
Caloplaca ferruginea
Candelariella vitellina
Dermatocarpon americanum
Diploschistes scruposus
Esslingeriana idahoensis
Evernia prunastri
Hypocenomyce anthracophila
Hypogymnia enteromorpha
Hypogymnia imshaugii
Kaernefeltia merrillii
Koerberia sonomensis
Lecanora caesiorubella
Lecanora horiza
Lecanora pacifica
Lecanora sierrae
Lecidea atrobrunnea ssp. *stictica*
Lecidella euphorea
Leptochidium albociliatum
Leptogium californicum
Leptogium lichenoides
Leptogium tenuissimum
Letharia columbiana
Letharia vulpina
Megaspora verrucosa
Melanelia elegantula
Melanelia exasperatula
Ochrolechia mexicana
Ochrolechia subpallescens
Parmelia saxatilis
Parmelia sulcata
Parmelia testacea
Peltigera canina
Peltigera collina
Physcia aipolia

Physcia albinea
Physconia americana
Physconia detersa
Physconia enteroxantha
Platismatia glauca
Platismatia stenophylla
Protoparmelia badia
Psora nipponica
Ramalina farinacea
Rhizocarpon geographicum
Rhizoplaca melanophthalma
Tuckermannopsis chlorophylla
Tuckermannopsis merrillii
Tuckermannopsis platyphylla
Umbilicaria hyperborea
Umbilicaria phaea
Umbilicaria torrefacta

Inyo County
Acarospora smaragdula var. *lesdainii*
Acarospora strigata
Acarospora thamnina
Aspicilia caesiocinerea
Aspicilia contorta
Buellia bolacina
Buellia lepidastroidea
Buellia papillata
Caloplaca ammiospila
Caloplaca arenaria
Caloplaca trachyphylla
Candelariella aurella
Candelariella rosulans
Candelariella vitellina
Catapyrenium daedaleum
Catapyrenium squamellum
Chaenothecopsis epithallina
Cladonia nashii
Collema tenax
Dimelaena oreina
Diploschistes muscorum ssp. *muscorum*
Lecanora cenisia
Lecanora garovaglii
Lecanora muralis
Lecanora novomexicana
Lecanora polytropa
Lecanora rupicola
Lecanora sierrae
Lecidea atrobrunnea ssp. *stictica*
Lecidea auriculata
Lecidea diducens
Lecidea hassei
Lecidea tessellata
Lepraria neglecta
Leprocaulon subalbicans
Letharia vulpina
Lobothallia alphoplaca
Melanelia tominii
Peltigera collina
Peltigera ponojensis
Phaeophyscia decolor
Phaeophyscia kairamoi
Physcia dubia
Physcia tribacia
Physconia enteroxantha
Physconia isidiigera
Physconia isidiomuscigena
Physconia muscigena
Placidium lachneum
Placidium lacinulatum
Placidium squamulosum
Pleopsidium chlorophanum
Pleopsidium flavum
Polysporina simplex
Protoparmelia badia
Pseudephebe minuscula
Psora decipiens
Psora globifera
Psora pruinosa
Rhizocarpon riparium
Rhizoplaca chrysoleuca
Rhizoplaca melanophthalma
Sarcogyne privigna
Sarcogyne regularis
Sarcogyne similis
Sporastatia testudinea
Staurothele drummondii
Umbilicaria krascheninnikovii
Umbilicaria virginis
Vouauxiella lichenicola
Xanthoparmelia coloradoensis
Xanthoria candelaria
Xanthoria elegans
Xanthoria sorediata

Lake County
Alectoria sarmentosa
Aspicilia gibbosa
Aspicilia laevata
Buellia aethalea
Caloplaca cerina
Caloplaca ferruginea
Caloplaca flavovirescens
Caloplaca holocarpa
Caloplaca luteominia
Candelaria concolor
Candelariella rosulans
Candelariella vitellina
Cladonia conistea
Cladonia ochrochlora
Collema crispum
Collema furfuraceum
Collema nigrescens
Dermatocarpon americanum
Diploicia canescens
Diploschistes actinostomus
Diploschistes muscorum ssp. *muscorum*
Esslingeriana idahoensis
Evernia prunastri
Flavoparmelia caperata
Flavopunctelia flaventior
Heterodermia leucomela
Hypogymnia enteromorpha
Hypogymnia imshaugii
Hypogymnia inactiva
Hypogymnia tubulosa
Kaernefeltia merrillii
Lecanora confusa
Lecanora pacifica
Lecanora tessellina
Lecidea atrobrunnea
Lecidella elaeochroma
Leptochidium albociliatum
Leptogium corniculatum
Leptogium lichenoides
Letharia vulpina
Lobaria hallii
Lobaria scrobiculata
Melanelia glabra
Melanelia multispora
Melanelia subargentifera
Microcalicium disseminatum
Nephroma laevigatum
Nephroma parile
Normandina pulchella
Ochrolechia africana
Ochrolechia farinacea
Ochrolechia juvenalis
Ochrolechia mexicana
Ophioparma rubricosa
Parmelia saxatilis
Parmelia sulcata
Parmelina quercina
Peltigera aphthosa
Peltigera collina
Peltigera venosa
Pertusaria amara
Pertusaria hymenea
Physcia adscendens
Physcia aipolia
Physcia caesia
Physcia tenella
Physconia americana
Physconia enteroxantha
Physconia isidiigera
Placidium fingens
Platismatia glauca
Platismatia herrei
Pseudocyphellaria anomala
Pseudocyphellaria anthraspis
Pyrrhospora russula
Ramalina farinacea
Rhizocarpon geographicum
Rinodina endospora
Rinodina hallii
Rinodina santae-monicae
Sarcogyne novomexicana
Syzygospora physciacearum
Tuckermannopsis chlorophylla
Tuckermannopsis platyphylla
Umbilicaria phaea
Usnea californica
Usnea cavernosa
Usnea filipendula
Usnea glabrata
Usnea hirta
Usnea scabrata
Usnea subfloridana
Verrucaria fusconigrescens
Vulpicida canadensis

Waynea californica
Xanthoparmelia coloradoensis
Xanthoria polycarpa

Lassen County
Aspicilia caesiocinerea
Aspicilia contorta
Caloplaca epithallina
Candelaria concolor
Candelariella terrigena
Dermatocarpon americanum
Hypocenomyce scalaris
Lecanora argopholis
Lecanora sierrae
Lecidea atrobrunnea
Lecidea tessellata
Lecidella stigmatea
Leptogium lichenoides
Letharia columbiana
Trapeliopsis flexuosa
Umbilicaria hyperborea
Umbilicaria torrefacta
Xanthoria fulva

Los Angeles County
A*carospora fuscata*
Acarospora schleicheri
Acarospora smaragdula var. lesdainii
Aspicilia contorta
Buellia halonia
Buellia oidalea
Caloplaca bolacina
Caloplaca californica
Caloplaca catalinae
Caloplaca coralloides
Caloplaca luteominia
Caloplaca oregona
Caloplaca rosei
Caloplaca saxicola
Caloplaca stanfordensis
Caloplaca stantonii
Catapyrenium squamellum
Catillaria columbiana
Chrysothrix candelaris
Cladonia scabriuscula
Dendrographa alectoroides
Dendrographa leucophaea
Dermatocarpon americanum
Dimelaena radiata
Dimelaena thysanota
Diploicia canescens
Diploschistes scruposus
Dirina catalinariae f. *catalinariae*
Dirina catalinariae sorediata
Endocarpon pusillum
Evernia prunastri
Flavoparmelia caperata
Flavopunctelia flaventior
Fuscopannaria praetermissa
Fuscopannaria pulveracea
Heppia lutosa
Heterodermia erinacea
Heterodermia leucomela
Lecanactis dimelaenoides
Lecania brunonis
Lecania dudleyi
Lecanographa hypothallina
Lecanora caesiorubella
Lecanora demissa
Lecanora gangaleoides
Lecanora horiza
Lecanora muralis
Lecanora rupicola
Lecanora subcarnea
Lecanora xanthosora
Lecidea mannii
Lecidella asema
Leprocaulon microscopicum
Leptochidium albociliatum
Leptogium californicum
Letharia vulpina
Lichenothelia tenuissima
Mobergia angelica
Neofuscelia verruculifera
Nephroma parile
Niebla cephalota
Niebla ceruchis
Niebla ceruchoides
Niebla homalea
Niebla isidiascens
Niebla laevigata
Niebla procera
Niebla robusta
Parmelia sulcata
Parmotrema chinense
Parmotrema hypoleucinum
Peltula euploca
Pertusaria amara
Pertusaria flavicunda
Phaeophyscia cernohorskyi
Phaeophyscia decolor
Phaeophyscia kairamoi
Physcia adscendens
Physcia clementei
Physcia phaea
Physcia stellaris
Physcia tenella
Physconia enteroxantha
Physconia isidiigera
Placidium californicum
Placidium chilense
Polycauliona coralloides
Psora decipiens
Psorotichia segregata
Psorula scotopholis
Punctelia borreri
Punctelia perreticulata
Punctelia stictica
Pyrrhospora quernea
Ramalina canariensis
Ramalina farinacea
Ramalina fastigiata
Ramalina lacera
Ramalina leptocarpha
Ramalina menziesii
Ramalina pollinaria
Reinkella parishii
Rimelia reticulata
Rimularia insularis
Rinodina bolanderi
Rinodina hallii
Rinodina luridata
Roccella babingtonii
Roccella fimbriata
Schizopelte californica
Sclerophyton cerebriforme
Sigridea californica
Sticta fuliginosa
Teloschistes chrysophthalmus
Teloschistes flavicans
Tephromela atra
Texosporium sancti-jacobi
Thelomma mammosum
Toninia ruginosa ssp. *pacifica*
Toninia submexicana
Toninia tristis
Umbilicaria phaea
Xanthoparmelia mexicana
Xanthoria fallax

Madera County
Caloplaca bolacina
Dendrographa leucophaea
Flavoparmelia caperata
Heterodermia leucomela
Niebla homalea
Parmotrema chinense
Parmotrema crinitum
Pertusaria californica
Phaeophyscia decolor
Punctelia stictica
Ramalina menziesii
Teloschistes flavicans
Xanthoria candelaria

Marin County
Acarospora schleicheri
Anaptychia setifera
Arthonia glebosa
Bacidina californica
Bryoria furcellata
Bryoria spiralifera
Buellia halonia
Buellia lepidastra
Buellia oidalea
Caloplaca bolacina
Caloplaca chrysophthalma
Caloplaca coralloides
Caloplaca decipiens
Caloplaca subpyraceella
Caloplaca variabilis
Candelaria concolor
Catapyrenium psoromoides
Cetraria chlorophylla
Cetraria platyphylla
Chrysothrix candelaris
Cladonia asahinae
Cladonia bellidiflora
Cladonia cervicornis ssp. *verticillata*
Cladonia conistea
Cladonia fimbriata

Cladonia furcata
Cladonia macilenta
Cladonia ochrochlora
Cladonia pyxidata
Cladonia squamosa var. *subsquamosa*
Cladonia subulata
Cladonia thiersii
Coelocaulon muricatum
Coenogonium lutea
Collema furfuraceum
Collema nigrescens
Collema tenax
Cyphelium tigillare
Dendriscocaulon intricatulum
Dendrographa leucophaea
Dermatocarpon americanum
Dermatocarpon intestiniforme
Dermatocarpon luridum
Dermatocarpon miniatum
Dimelaena oreina
Dimelaena radiata
Dimelaena thysanota
Diploschistes muscorum ssp. *muscorum*
Diploschistes scruposus
Endocarpon loscosii
Endocarpon pusillum
Evernia prunastri
Flavoparmelia caperata
Flavopunctelia flaventior
Fuscopannaria cyanolepra
Gyalecta herrei
Gyalecta jenensis
Heppia lutosa
Heterodermia leucomela
Heterodermia namaquana
Hyperphyscia adglutinata
Hypocenomyce scalaris
Hypogymnia enteromorpha
Hypogymnia heterophylla
Hypogymnia inactiva
Hypogymnia occidentalis
Hypogymnia physodes
Hypogymnia tubulosa
Hypotrachyna revoluta
Ionaspis alba
Japewia tornöensis
Koerberia biformis
Koerberia sonomensis
Lecania dudleyi
Lecanographa hypothallina
Lecanora caesiorubella ssp. *merrillii*
Lecanora demissa
Lecanora gangaleoides
Lecanora muralis
Lecanora pacifica
Lecanora phryganitis
Lecanora phryganitis
Lecanora rupicola
Lecanora subfusca
Lecidea atrobrunnea
Lecidea mannii
Lecidea tessellata
Lecidella asema
Lecidella stigmatea
Leprocaulon subalbicans
Leptochidium albociliatum
Leptogium cellulosum
Leptogium corniculatum
Leptogium furfuraceum
Leptogium lichenoides
Leptogium pseudofurfuraceum
Leptogium tenuissimum
Lobaria pulmonaria
Lobaria scrobiculata
Lobothallia alphoplaca
Melanelia elegantula
Melanelia glabratula
Melanelia panniformis
Melanelia subaurifera
Melanelia subolivacea
Micarea prasina
Mycoblastus sanguinarius
Neofuscelia verruculifera
Nephroma helveticum
Nephroma laevigatum
Nephroma parile
Nephroma resupinatum
Niebla cephalota
Niebla ceruchoides
Niebla disrupta
Niebla procera
Normandina pulchella
Ochrolechia oregonensis
Ochrolechia subpallescens
Ochrolechia upsaliensis
Ophioparma rubricosa
Parmelia saxatilis
Parmelia sulcata
Parmeliella cyanolepra
Parmelina quercina
Parmotrema arnoldii
Parmotrema crinitum
Parmotrema reticulatum
Parmotrema stuppeum
Peltigera collina
Peltula bolanderi
Peltula euploca
Pertusaria amara
Pertusaria californica
Phaeophyscia cernohorskyi
Phaeophyscia decolor
Phaeophyscia orbicularis
Phaeophyscia sciastra
Phylliscum demangeonii
Physcia adscendens
Physcia aipolia
Physcia albinea
Physcia dubia
Physcia erumpens
Physcia phaea
Physcia stellaris
Physcia tenella
Physcia tribacia
Physconia americana
Physconia enteroxantha
Physconia isidiigera
Pilophorus acicularis
Placidiopsis cinerascens
Placidium lacinulatum
Platismatia glauca
Platismatia herrei
Platismatia stenophylla
Polychidium muscicola
Polysporina simplex
Protoparmelia badia
Pseudocyphellaria anomala
Pseudocyphellaria anthraspis
Pseudocyphellaria crocata
Pseudocyphellaria rainierensis
Psora nipponica
Psora pacifica
Punctelia borreri
Punctelia perreticulata
Punctelia stictica
Pyrrhospora cinnabarina
Pyrrhospora quernea
Ramalina farinacea
Ramalina menziesii
Ramalina pollinaria
Ramalina subleptocarpha
Rhizocarpon geographicum
Rimularia insularis
Sarcogyne regularis
Sarea resinae
Sclerophyton cerebriforme
Solenospora crenata
Sphaerophorus globosus
Staurothele areolata
Stereocaulon intermedium
Sticta fuliginosa
Sticta limbata
Teloschistes californicus
Teloschistes chrysophthalmus
Teloschistes exilis
Teloschistes flavicans
Tephromela aglaea
Tephromela atra
Texosporium sancti-jacobi
Thelomma californicum
Thelomma mammosum
Thelomma occidentale
Thelotrema lepadinum
Toninia ruginosa ssp. *ruginosa*
Trapeliopsis flexuosa
Trapeliopsis granulosa
Trapeliopsis wallrothii
Tremolecia atrata
Tuckermannopsis merrillii
Tuckermannopsis orbata
Umbilicaria phaea
Umbilicaria polyphylla
Umbilicaria polyrhiza
Usnea arizonica
Usnea ceratina
Usnea cornuta
Usnea rubicunda
Usnea subgracilis
Usnea wirthii
Verrucaria sphaerospora

Waynea californica
Xanthoparmelia cumberlandia
Xanthoparmelia mougeotii
Xanthoparmelia plittii
Xanthoria candelaria
Xanthoria fallax
Xanthoria hasseana
Xanthoria oregana
Xanthoria parietina
Xanthoria polycarpa
Xanthoria tenax

Mariposa County
Koerberia sonomensis
Micarea prasina
Mycoblastus sanguinarius
Neofuscelia verruculifera
Nephroma helveticum ssp. *sipeanum*
Nephroma laevigatum
Nephroma parile
Nephroma resupinatum
Niebla cephalota
Niebla ceruchoides

Mendocino County
Alectoria montana
Alectoria sarmentosa
Arthonia cinnabarina
Bryoria furcellata
Bryoria fuscescens
Buellia halonia
Buellia stellulata
Calicium lenticulare
Candelaria concolor
Candelaria concolor var. *effusa*
Cavernularia lophyrea
Chrysothrix candelaris
Cladidium bolanderi
Cladina portentosa ssp. *pacifica*
Cladonia bellidiflora
Cladonia carassensis
Cladonia cervicornis ssp. *verticillata*
Cladonia chlorophaea
Cladonia coniocraea
Cladonia crispata
Cladonia fimbriata
Cladonia furcata
Cladonia macilenta
Cladonia pyxidata
Cladonia rei
Cladonia squamosa var. *subsquamosa*
Cladonia subfimbriata
Cladonia subulata
Cladonia transcendens
Coenogonium lutea
Dendriscocaulon intricatulum
Dermatocarpon americanum
Dermatocarpon intestiniforme
Dibaeis baeomyces
Diploschistes actinostomus
Diploschistes scruposus
Evernia prunastri
Flavoparmelia caperata
Flavopunctelia flaventior
Fuscopannaria pulveracea
Graphis striatula
Heterodermia leucomela
Hypogymnia enteromorpha
Hypogymnia inactiva
Hypogymnia occidentalis
Hypogymnia physodes
Hypogymnia tubulosa
Kaernefeltia californica
Lecanora californica
Lecanora gangaleoides
Lecanora phryganitis
Lecanora pinguis
Lecanora rupicola
Lecidea atrobrunnea
Lecidella asema
Lepraria membranacea
Leptochidium albociliatum
Leptogium corniculatum
Leptogium lichenoides
Leptogium teretiusculum
Letharia vulpina
Lichinella nigritella
Lobaria pulmonaria
Lobaria scrobiculata
Loxosporopsis corallifera
Melanelia elegantula
Melanelia subaurifera
Melanelia subolivacea
Menegazzia terebrata
Mycoblastus affinis
Mycoblastus sanguinarius
Nephroma helveticum
Nephroma laevigatum
Nephroma resupinatum
Niebla homalea
Nodobryoria abbreviata
Ochrolechia juvenalis
Ochrolechia oregonensis
Ochrolechia subpallescens
Ochrolechia tartarea
Ochrolechia upsaliensis
Pannaria conoplea
Parmelia hygrophila
Parmelia saxatilis
Parmelia squarrosa
Parmelia sulcata
Parmotrema arnoldii
Parmotrema chinense
Parmotrema crinitum
Peltigera canina
Peltigera collina
Peltigera neopolydactyla
Peltigera praetextata
Peltula euploca
Pertusaria amara
Pertusaria californica
Physconia isidiigera
Platismatia glauca
Platismatia herrei
Pseudocyphellaria anomala
Pseudocyphellaria anthraspis
Pyrrhospora quernea
Ramalina farinacea
Ramalina menziesii
Ramalina roesleri
Rhizocarpon concentricum
Sarea resinae
Sphaerophorus globosus
Sticta fuliginosa
Sticta limbata
Sulcaria badia
Thelomma mammosum
Thelomma occidentale
Thelotrema lepadinum
Trapeliopsis flexuosa
Trapeliopsis wallrothii
Tuckermannopsis orbata
Tuckermannopsis platyphylla
Umbilicaria phaea
Usnea arizonica
Usnea californica
Usnea ceratina
Usnea condensata
Usnea filipendula
Usnea fragilescens
Usnea longissima
Usnea occidentalis
Usnea rubicunda
Xanthoria candelaria
Xanthoria fallax
Xanthoria polycarpa

Modoc County
Bellemerea alpina
Bryoria fremontii
Bryoria fuscescens
Buellia alboatra
Buellia disciformis
Caloplaca jungermanniae
Candelariella vitellina
Cladonia carneola
Cladonia fimbriata
Dermatocarpon reticulatum
Endocarpon pulvinatum
Hypogymnia imshaugii
Lecanora bicincta
Lecanora cenisia
Lecanora polytropa
Lecanora pseudomellea
Lecanora reagens
Lecidea auriculata
Leptogium lichenoides
Staurothele drummondii
Umbilicaria hyperborea
Umbilicaria virginis
Xanthoria candelaria
Xanthoria elegans
Xanthoria montana

Monterey County
Acarospora geogena
Acarospora schleicheri
Acarospora smaragdula
Arthonia radiata
Bryoria spiralifera

Buellia punctata
Caloplaca cerina
Caloplaca chrysophthalma
Caloplaca cinnabarina
Caloplaca ferruginea
Caloplaca holocarpa
Caloplaca saxicola
Caloplaca vitelinnula
Candelaria concolor var. *effusa*
Candelariella vitellina var.asserticola
Chrysothrix candelaris
Cladonia coniocraea
Cladonia fimbriata
Cladonia subradiata
Collema furfuraceum var. *luzonense*
Collema nigrescens
Cyphelium lucidum
Dermatocarpon americanum
Diploschistes muscorum ssp. *muscorum*
Diploschistes scruposus
Evernia prunastri
Flavoparmelia caperata
Hypogymnia imshaugii
Hypogymnia occidentalis
Kaernefeltia merrillii
Koerberia biformis
Lecanora demissa
Lecanora symmicta
Lecanora cotopholis
Lecidea atrobrunnea
Lecidea tessellata
Lepraria membranacea
Leptochidium albociliatum
Leptogium arsenei
Leptogium corniculatum
Leptogium furfuraceum
Letharia columbiana
Letharia vulpina
Melanelia glabra
Melanelia glabroides
Melanelia multispora
Melanelia subelegantula
Melanelia subolivacea
Nephroma helveticum
Peltigera canina
Peltigera collina
Peltigera degenii
Peltigera membranacea
Peltigera praetextata
Peltula obscurans var. *hassei*
Pertusaria amara
Pertusaria leioplaca
Phaeophyscia cernohorskyi
Phaeophyscia kairamoi
Physcia adscendens
Physcia aipolia
Physcia biziana
Physcia stellaris
Physcia tenella
Physconia americana
Physconia enteroxantha
Physconia isidiigera
Physconia perisidiosa
Polychidium muscicola
Pseudocyphellaria anomala
Pseudocyphellaria anthraspis
Psora californica
Psora decipiens
Psora nipponica
Psora tuckermanii
Punctelia perreticulata
Ramalina farinacea
Ramalina leptocarpha
Ramalina menziesii
Rinodina tephraspis
Sticta fuliginosa
Syzygospora physciacearum
Tephromela atra
Thelomma occidentale
Toninia massata
Toninia sedifolia
Trapeliopsis granulosa
Tuckermannopsis chlorophylla
Tuckermannopsis platyphylla
Umbilicaria phaea
Xanthomendoza fallax
Xanthoparmelia cumberlandia
Xanthoparmelia mexicana
Xanthoparmelia taractica
Xanthoria candelaria
Xanthoria polycarpa
Xanthoria ramulosa
Xanthoria ramulosa

Napa County
Acarospora fuscata
Aspicilia caesiocinerea
Bryoria capillaris
Bryoria fremontii
Bryoria furcellata
Buellia disciformis
Caloplaca cerina
Caloplaca citrina
Caloplaca squamosa
Candelaria concolor
Chrysothrix candelaris
Cladonia chlorophaea
Cladonia fimbriata
Cladonia macilenta
Cladonia ochrochlora
Collema nigrescens
Evernia prunastri
Flavoparmelia caperata
Flavopunctelia flaventior
Hypocenomyce anthracophila
Hypocenomyce scalaris
Hypogymnia imshaugii
Hypogymnia physodes
Hypogymnia tubulosa
Kaernefeltia californica
Lecanora mellea
Lecanora muralis
Lecanora sierrae
Lecidea atrobrunnea
Leptochidium albociliatum
Leptogium corniculatum
Leptogium gelatinosum
Leptogium lichenoides
Melanelia subargentifera
Ochrolechia oregonensis
Ochrolechia subpallescens
Ophioparma rubricosa
Parmelia hygrophila
Parmelia sulcata
Parmelina quercina
Parmelina quercina
Peltigera collina
Peltigera membranacea
Pertusaria albescens
Pertusaria amara
Physcia adscendens
Physcia aipolia
Physcia stellaris
Physconia americana
Platismatia glauca
Platismatia herrei
Polysporina simplex
Pseudocyphellaria anthraspis
Psora globifera
Psora nipponica
Punctelia perreticulata
Rhizocarpon geographicum
Trapeliopsis flexuosa
Trapeliopsis wallrothii
Tremolecia atrata
Umbilicaria phaea
Umbilicaria polyrhiza
Waynea californica
Xanthoparmelia cumberlandia
Xanthoria polycarpa

San Benito County
Acarospora cf. *glaucocarpa*
Acarospora obpallens
Acarospora schleicheri
Acarospora socialis
Acarospora thelococcoides
Aspicilia caesiocinerea
Aspicilia calcarea
Aspicilia californica
Aspicilia cf. *contorta*
Aspicilia cinerea
Aspicilia contorta
Buellia disciformis
Buellia penichra
Buellia sequax
Buellia stillingiana
Buellia turgescens
Caloplaca bolacina
Caloplaca chrysophthalma
Caloplaca demissa
Caloplaca flavorubescens
Caloplaca ignea
Caloplaca impolita
Caloplaca oregona
Caloplaca trachyphylla
Candelaria concolor
Candelariella aurella
Candelariella vitellina

Candelariella rosulans
Candelariella terrigena
Chrysothrix chlorina
Cladonia asahinae
Cladonia chlorophaea
Cladonia fimbriata
Cladonia ochrochlora
Cladonia pyxidata
Cladonia subulata
Cladonia verruculosa
Collema cf. *polycarpon*
Collema furfuraceum
Collema nigrescens
Collema subflaccidum
Cyphelium inquinans
Cyphelium tigillare
Dermatocarpon americanum
Dermatocarpon miniatum
Dermatocarpon reticulatum
Dimelaena radiata
Dimelaena thysanota
Diploschistes diacapsis
Diploschistes gypsaceus
Diploschistes muscorum ssp. *muscorum*
Diploschistes scruposus
Diplotomma alboatrum
Endocarpon pusillum
Evernia prunastri
Flavopunctelia flaventior
Flavopunctelia soredica
Fuscopannaria californica
Fuscopannaria coralloidea
Fuscopannaria cyanolepra
Fuscopannaria pacifica
Fuscopannaria praetermissa
Hypocenomyce scalaris
Hypogymnia imshaugii
Imshaugia aleurites
Kaernefeltia merrillii
Lecania cf. *dubitans*
Lecanora gangaleoides
Lecanora hybocarpa
Lecanora muralis
Lecanora pseudomellea
Lecanora sierrae
Lecanora strobilina
Lecanora varia
Lecidea atrobrunnea
Lecidea auriculata
Lecidea berengeriana
Lecidea cf. *austrocalifornica*
Lecidea fuscatoatra
Lecidea fuscoatra var. *grisella*
Lecidea lapicida var. *lapicida*
Lecidea lapicida var. *pantherina*
Lecidea mannii
Lecidea protobacina
Lecidea tessellata
Lecidella carpathica
Lecidella elaeochroma
Lecidella euphorea
Lempholemma cladodes
Lepraria membranacea
Leptochidium albociliatum
Leptogium cf. *californicum*
Leptogium cf. *lichenoides*
Leptogium palmatum
Leptogium pseudofurfuraceum
Letharia columbiana
Letharia vulpina
Lichinella nigritella
Lichinella stipatula
Melanelia exasperatula
Melanelia glabra
Melanelia glabroides
Melanelia multispora
Melanelia subargentifera
Melanelia subelegantula
Melanelia subolivacea
Melanelia tominii
Mycocalicium subtile
Neofuscelia subhossiana
Ochrolechia subpallescens
Ochrolechia upsaliensis
Parmelia hygrophila
Parmelia sulcata
Parmeliella cyanolepra
Parmelina quercina
Peltigera rufescens
Peltula euploca
Peltula obscurans var. *hassei*
Phaeophyscia constipata
Phaeophyscia decolor
Phaeophyscia hispidula
Phaeophyscia orbicularis
Physcia adscendens
Physcia aipolia
Physcia biziana
Physcia caesia
Physcia dimidiata
Physcia dubia
Physcia phaea
Physcia stellaris
Physcia tenella
Physcia tribacia
Physconia americana
Physconia californica
Physconia enteroxantha
Physconia perisidiosa
Placynthiella icmalea
Placynthiella uliginosa
Pleopsidium flavum
Polysporina simplex
Protoparmelia badia
Psora globifera
Psora nipponica
Psora pacifica
Psora russellii
Psora tuckermanii
Punctelia perreticulata
Ramalina farinacea
Ramalina leptocarpha
Ramalina menziesii
Ramalina puberulenta
Ramalina subleptocarpha
Rhizocarpon bolanderi
Rhizocarpon distinctum
Rhizocarpon geographicum
Rhizoplaca chrysoleuca
Rhizoplaca melanophthalma
Rinodina bolanderi
Rinodina confragosa
Rinodina conradii
Rinodina glauca
Tephromela atra
Texosporium sancti-jacobi
Toninia ruginosa
Trapelia involuta
Trapeliopsis californica
Trapeliopsis flexuosa
Trapeliopsis granulosa
Trapeliopsis wallrothii
Umbilicaria phaea
Umbilicaria polyphylla
Usnea hirta
Usnea substerilis
Verrucaria memnonia
Vouauxiella lichenicola
Waynea californica
Xanthomendoza fallax
Xanthomendoza hasseana
Xanthomendoza oregana
Xanthoparmelia angustiphylla
Xanthoparmelia coloradoensis
Xanthoparmelia cumberlandia
Xanthoparmelia mexicana
Xanthoria candelaria
Xanthoria elegans
Xanthoria fallax
Xanthoria hasseana
Xanthoria oregana
Xanthoria polycarpa

San Bernadino County
Acarospora californica
Acarospora cf. *heppia*
Acarospora fuscata
Acarospora geogena
Acarospora peltasticta
Amandinea punctata
Buellia aethalea
Caloplaca arenaria
Caloplaca decipiens
Caloplaca fraudans
Caloplaca pellodella
Caloplaca saxicola
Caloplaca trachyphylla
Candelariella rosulans
Catapyrenium lachneum
Collema crispum
Dermatocarpon cf. *americanum*
Dermatocarpon reticulatum
Dimelaena thysanota
Diploschistes scruposus
Endocarpon pusillum
Fulgensia desertorum
Heppia lutosa
Lecanora garovaglii
Lecanora muralis

Lecidea cf. *atrobrunnea*
Leptogium corniculatum
Lichinella nigritella
Lobothallia alphoplaca
Lobothallia praeradiosa
Melanelia tominii
Niebla laminaria
Niebla testudinaria
Punctelia perreticulata
Rhizocarpon concentricum
Rinodina conradii
Roccella fimbriata
Xanthoria mendozaee

San Clemente Island
Acarospora fuscata
Acarospora schleicheri
Acarospora smaragdula
Amandinea punctata
Aspicilia contorta
Buellia cerussata
Buellia halonia
Buellia oidalea
Caloplaca bolacina
Caloplaca californica
Caloplaca catalinae
Caloplaca cf. *sipeana*
Caloplaca coralloides
Caloplaca luteominia
Caloplaca oregona
Caloplaca rosei
Caloplaca saxicola
Caloplaca stanfordensis
Caloplaca stantonii
Catillaria columbiana
Chrysothrix candelaris
Cladonia scabriuscula
Collema cf. *tenax*
Dendrographa alectoroides
Dendrographa leucophaea
Dermatocarpon americanum
Dimelaena radiata
Dimelaena thysannota
Diploicia canescens
Diploschistes scruposus
Dirina catalinariae f. *catalinariae*
Dirina catalinariae f. *sorediata*
Endocarpon pusillum
Evernia prunastri
Flavoparmelia caperata
Flavopunctelia flaventior
Fuscopannaria praetermissa
Heppia lutosa
Heterodermia erinacea
Heterodermia leucomela
Lecanactis dimelaenoides
Lecania brunonis
Lecania dudleyi
Lecanographa hypothallina
Lecanora caesiorubella
Lecanora demissa
Lecanora gangaleoides
Lecanora horiza
Lecanora rupicola
Lecanora subcarnea
Lecanora xanthosora
Lecidea mannii
Lecidella asema
Leprocaulon microscopicum
Leptochidium albociliatum
Leptogium californicum
Leptogium lichenoides
Lichenothelia tenuissima
Mobergia angelica
Neofuscelia verruculifera
Nephroma parile
Niebla cephalota
Niebla ceruchis
Niebla ceruchoides
Niebla homalea
Niebla isidiascens
Niebla laevigata
Niebla procera
Niebla robusta
Parmelia sulcata
Parmotrema chinense
Parmotrema hypoleucinum
Peltula euploca
Pertusaria amara
Pertusaria cf. *bispora*
Pertusaria flavicunda
Phaeophyscia cernohorskyi
Physcia adscendens
Physcia callosa
Physcia clementei
Physcia phaea
Physcia stellaris
Physcia tenella
Physconia enteroxantha
Physconia isidiigera
Polycauliona coralloides
Psora decipiens
Psorula scotopholis
Punctelia borreri
Punctelia stictica
Punctelia subrudecta
Pyrrhospora quernea
Ramalina canariensis
Ramalina farinacea
Ramalina fastigiata
Ramalina lacera
Ramalina leptocarpha
Ramalina menziesii
Ramalina pollinaria
Reinkella parishii
Rimelia reticulata
Rimularia insularis
Rinodina bolanderi
Rinodina conradii
Rinodina hallii
Rinodina luridata
Roccella babingtonii
Roccella fimbriata
Schizopelte californica
Sclerophyton cerebriforme
Sigridea californica
Sticta fuliginosa
Teloschistes californicus
Teloschistes chrysophthalmus
Teloschistes flavicans
Tephromela atra
Thelomma mammosum
Toninia ruginosa
Toninia tristis
Umbilicaria phaea
Usnea rubicunda
Xanthoparmelia mexicana
Xanthoria fallax

San Diego County
Acarospora glaucocarpa
Acarospora schleicheri
Caloplaca chrysophthalma
Caloplaca luteominia var. *luteominia*
Caloplaca subpyraceella
Candelaria concolor
Candelariella deppeanae
Chrysothrix candelaris
Cladonia chlorophaea
Cladonia firma
Cladonia scabriuscula
Clavascidium umbrinum
Collema nigrescens
Dimelaena oreina
Dimelaena radiata
Dimelaena thysanota
Diploschistes actinostomus
Diploschistes diacapsis
Diploschistes gypsaceus
Diploschistes muscorum ssp. *muscorum*
Diploschistes scruposus
Endocarpon pusillum
Endocarpon subnitescens
Evernia prunastri
Flavoparmelia caperata
Flavoparmelia subcapitata
Flavopunctelia flaventior
Hyperphyscia adglutinata
Lecania cyathiformis
Leprocaulon microscopicum
Lichinella stipatula
Peltula euploca
Peltula patellata
Peltula zahlbruckneri
Phaeographis erumpens
Phaeophyscia cernohorskyi
Phaeophyscia decolor
Phaeophyscia hirtella
Physcia adscendens
Physcia tribacia
Physconia enteroxantha
Physconia isidiigera
Physconia perisidiosa
Placidium lacinulatum
Placidium squamulosum
Polysporina simplex
Psora decipiens
Psora pacifica
Ramalina farinacea

Roccella babingtonii
Roccella fimbriata
Roccella peruensis
Teloschistes chrysophthalmus
Texosporium sancti-jacobi
Thelomma mammosum
Trapeliopsis wallrothii
Umbilicaria phaea
Xanthoparmelia angustiphylla
Xanthoparmelia coloradoensis
Xanthoparmelia cumberlandia
Xanthoparmelia mexicana
Xanthoparmelia mougeotii
Xanthoria fallax

San Luis Obispo County
Alectoria sarmentosa
Amandinea punctata
Arthonia gyalectoides
Arthonia tetramera
Arthothelium orbilliferum
Aspicilia calcarea
Bryoria pseudocapillaris
Bryoria spiralifera
Buellia aethalea
Calicium glaucellum
Caloplaca arenaria
Caloplaca chrysophthalma
Caloplaca flavovirescens
Caloplaca fraudans
Caloplaca holocarpa
Caloplaca subpyraceella
Candelariella coralliza
Candelariella vitellina
Chrysothrix candelaris
Cladonia firma
Cladonia macilenta
Cladonia ochrochlora
Cliostomum griffithii
Collema furfuraceum
Dimelaena radiata
Diplotomma alboatrum
Evernia prunastri
Flavoparmelia caperata
Flavopunctelia flaventior
Hyperphyscia adglutinata
Hypogymnia enteromorpha
Hypogymnia inactiva
Lecania cyathiformis
Lecanographa hypothallina
Lecanora caesiorubella
Lecanora cf. *rupicola*
Lecanora expallens
Lecanora muralis
Lecanora phryganitis
Melanelia elegantula
Niebla cephalota
Niebla combeoides
Opegrapha herbarum
Parmelia sulcata
Parmotrema chinense
Parmotrema hypoleucinum
Pertusaria amara
Pertusaria leioplaca
Phaeophyscia cernohorskyi
Phaeophyscia kairamoi
Physcia adscendens
Physcia aipolia
Physcia dubia
Physcia tribacia
Physconia isidiigera
Pleopsidium chlorophanum
Pyrrhospora quernea
Ramalina canariensis
Ramalina farinacea
Ramalina fraxinea
Ramalina leptocarpha
Ramalina menziesii
Ramalina pollinaria
Ramalina subleptocarpha
Rhizocarpon concentricum
Rimelia reticulata
Rinodina hallii
Rinodina luridata
Rinodina santae-monicae
Roccella fimbriata
Roccellina franciscana
Sigridea californica
Sulcaria isidiifera
Teloschistes chrysophthalmus
Teloschistes flavicans
Tephromela atra
Thelomma santessonii
Toninia submexicana
Trapelia involuta
Usnea arizonica
Usnea cornuta
Usnea rubicunda
Usnea wirthii
Verrucaria aethiobola
Verrucaria maura
Verrucaria mucosa
Xanthoparmelia angustiphylla
Xanthoparmelia californica
Xanthoparmelia coloradoensis
Xanthoparmelia cumberlandia
Xanthoparmelia mexicana
Xanthoparmelia mougeotii
Xanthoria candelaria
Xanthoria mendozae
Xanthoria polycarpa

San Mateo County
Amandinea punctata
Anisomeridium biforme
Arthonia excedens
Arthothelium orbilliferum
Aspicilia cf. *caesiocinerea*
Bacidia heterochroa
Bacidia laurocerasi
Bacidina californica
Bacidina phacodes
Bryoria furcellata
Bryoria implexa
Bryoria pseudocapillaris
Buellia cf. *lepidastra*
Buellia halonia
Buellia oidalea
Buellia stellulata
Buellia triseptata
Caloplaca atrosanguinea
Caloplaca cerina
Caloplaca cf. *caesiocinerea.*
Caloplaca cf. *squamosa*
Caloplaca citrina
Caloplaca ferruginea
Caloplaca flavovirescens
Caloplaca holocarpa
Candelaria concolor
Chaenotheca chrysocephala
Chaenotheca furfuracea
Chaenotheca trichialis
Chrysothrix candelaris
Cladonia cf. *pyxidata*
Cladonia chlorophaea
Cladonia coniocraea
Cladonia fimbriata
Cladonia furcata
Cladonia macilenta
Cladonia macilenta var.macilenta
Cladonia ochrochlora
Cladonia squamosa
Cladonia squamosa var. *subsquamosa*
Cladonia transcendens
Cliostomum griffithii
Coenogonium lutea
Collema furfuraceum
Collema nigrescens
Cresponea chloroconia
Dermatocarpon americanum
Dimelaena radiata
Diploschistes muscorum ssp. *muscorum*
Diploschistes scruposus
Diplotomma alboatrum
Endocarpon pusillum
Evernia prunastri
Flavoparmelia caperata
Flavopunctelia flaventior
Fuscopannaria leucostictoides
Fuscopannaria praetermissa
Gyalecta herrei
Hafellia disciformis
Heterodermia leucomela
Hypogymnia apinnata
Hypogymnia cf. *metaphysodes*
Hypogymnia enteromorpha
Hypogymnia imshaugii
Hypogymnia inactiva
Hypogymnia tubulosa
Hypotrachyna revoluta
Kaernefeltia californica
Kaernefeltia merrillii
Lecania dubitans
Lecanora albella var.albella
Lecanora allophana
Lecanora caesiorubella ssp. *merrillii*
Lecanora gangaleoides
Lecanora hagenii
Lecanora pacifica

Lecanora phryganitis
Lecanora pinguis
Lecanora rupicola
Lecanora symmicta
Lecidea plebeja
Lecidella asema
Lecidella euphorea
Lecidella subincongrua
Lepraria lobificans
Lepraria membranacea
Leptochidium albociliatum
Leptogium californicum
Leptogium corniculatum
Leptogium furfuraceum
Leptogium lichenoides
Leptogium pseudofurfuraceum
Leptogium subtile
Leptogium tenuissimum
Letharia vulpina
Lobaria pulmonaria
Lobaria scrobiculata
Megalaria laureri
Melanelia multispora
Melanelia subaurifera
Mycocalicium albonigrum
Mycocalicium subtile
Neofuscelia verruculifera
Nephroma helveticum
Nephroma laevigatum
Nephroma resupinatum
Niebla cephalota
Niebla homalea
Normandina pulchella
Ochrolechia oregonensis
Ochrolechia pallescens
Ochrolechia subpallescens
Opegrapha glaucomaria
Opegrapha protuberans
Opegrapha rupestris
Pannaria rubiginosa
Parmelia saxatilis
Parmelia sulcata
Parmotrema arnoldii
Parmotrema chinense
Parmotrema crinitum
Parmotrema stuppeum
Peltigera canina
Peltigera collina
Peltigera membranacea
Peltigera polydactylon
Pertusaria amara
Pertusaria californica
Pertusaria cf. *albescens*
Pertusaria hymenea
Pertusaria lecanina
Pertusaria leioplaca
Pertusaria subambigens
Pertusaria velata
Phaeographis dendritica
Phaeophyscia orbicularis
Phlyctis argena
Phylliscum demangeonii
Physcia adscendens
Physcia aipolia
Physcia dubia
Physcia tenella
Physcia tribacia
Physconia isidiigera
Placynthiella uliginosa
Placynthium nigrum
Platismatia glauca
Platismatia herrei
Pseudocyphellaria anomala
Pseudocyphellaria anthraspis
Pseudocyphellaria crocata
Punctelia borreri
Punctelia perreticulata
Punctelia stictica
Punctelia subrudecta
Pyrrhospora elabens
Pyrrhospora quernea
Ramalina dilacerata
Ramalina farinacea
Ramalina leptocarpha
Ramalina menziesii
Ramalina pollinaria
Ramalina puberulenta
Rinodina exigua
Rinodina hallii
Roccellina franciscana
Sphaerophorus globosus
Sticta fuliginosa
Sticta limbata
Teloschistes californicus
Teloschistes chrysophthalmus
Teloschistes flavicans
Tephromela atra
Thelomma californicum
Thelomma occidentale
Topelia californica
Tuckermannopsis chlorophylla
Tuckermannopsis orbata
Usnea arizonica
Usnea californica
Usnea cavernosa
Usnea filipendula
Usnea fragilescens
Usnea fulvoreagens
Usnea glabrata
Usnea kujalae
Usnea pendulina
Usnea rubicunda
Usnea scabiosa
Usnea scabrata
Usnea subfloridana
Usnea substerilis
Usnea wirthii
Verrucaria tavaresiae
Waynea californica
Xanthoparmelia cumberlandia
Xanthoparmelia lineola
Xanthoparmelia mexicana
Xanthoria candelaria
Xanthoria cf. *fulva*
Xanthoria fallax var.fallax
Xanthoria hasseana
Xanthoria oregana
Xanthoria parietina
Xanthoria polycarpa

Santa Barbara County
Bacidina californica
Buellia capitis-regum
Caloplaca brattiae
Caloplaca coralloides
Caloplaca subpyraceella
Dendrographa leucophaea
Hypogymnia mollis
Lecanographa hypothallina
Leprocaulon microscopicum
Leptogium cellulosum
Leptogium teretiusculum
Parmotrema hypoleucinum
Peltula euploca
Pertusaria flavicunda
Phaeophyscia kairamoi
Psora californica
Schizopelte californica
Texosporium sancti-jacobi
Toninia submexicana
Xanthoparmelia californica
Xanthoria oregana

Santa Clara County
Candelaria concolor
Flavopunctelia flaventior
Hyperphyscia adglutinata
Lecanora muralis
Lecanora pacifica
Lecidea atrobrunnea
Phaeophyscia cernohorskyi
Phaeophyscia orbicularis
Physcia adscendens
Ramalina farinacea
Ramalina leptocarpha
Rhizocarpon geographicum
Tephromela atra

Santa Cruz County
Amandinea punctata
Anisomeridium biforme
Arthonia cf microspermella
Arthonia cf. *polygramma*
Arthonia cinnabarina
Arthonia ochrolutea
Arthonia pruinata
Arthopyrenia lyrata
Arthothelium orbilliferum
Arthothelium spectabile
Aspicilia contorta
Bacidia circumspecta
Bacidia heterochroa
Bactrospora spiralis
Buellia oidalea
Calicium abietinum
Caloplaca bolacina
Caloplaca cerina
Caloplaca chrysophthalma
Caloplaca citrina
Caloplaca ferruginea

Caloplaca microphyllina
Caloplaca stanfordensis
Caloplaca subsoluta
Candelaria concolor
Candelariella vitellina
Catapyrenium squamellum
Catillaria cf. *subviridis*
Catinaria atropurpurea
Chrysothrix candelaris
Cladonia cervicornis ssp. *verticillata*
Cladonia chlorophaea
Cladonia fimbriata
Cladonia furcata
Cladonia macilenta
Cladonia pyxidata
Cladonia squamosa var. *subsquamosa*
Cladonia subulata
Cladonia verruculosa
Cliostomum griffithii
Coenogonium lutea
Collema furfuraceum
Collema fuscovirens
Collema nigrescens
Collema polycarpon
Cyphelium tigillare
Diploicia canescens
Endocarpon loscosii
Endocarpon pusillum
Evernia prunastri
Flavoparmelia caperata
Flavopunctelia flaventior
Flavopunctelia soredica
Fuscopannaria leucostictoides
Fuscopannaria pacifica
Heterodermia leucomela
Hyperphyscia adglutinata
Hypocenomyce scalaris
Hypogymnia apinnata
Hypogymnia imshaugii
Hypogymnia physodes
Hypogymnia tubulosa
Hypotrachyna revoluta
Koerberia biformis
Lecanactis salicina
Lecania cf. *brunonis*
Lecania cf. *subdispersa*
Lecanora albellula
Lecanora caesiorubella
Lecanora dispersa
Lecanora impudens
Lecanora meridionalis
Lecanora muralis
Lecanora pacifica
Lecanora phryganitis
Lecanora strobilina
Lecanora subrugosa
Lecanora symmicta
Lecidea varians
Lecidella carpathica
Lecidella elaeochroma
Lecidella euphorea
Leptogium millegranum
Melanelia subaurifera
Neofuscelia verruculifera
Niebla cephalota
Normandina pulchella
Ochrolechia subpallescens
Opegrapha atra
Opegrapha herbarum
Opegrapha umbellulariae
Opegrapha varia
Pannaria conoplea
Parmelia saxatilis
Parmelia sulcata
Parmotrema arnoldii
Parmotrema chinense
Parmotrema stuppeum
Peltigera canina
Peltigera collina
Pertusaria albescens
Pertusaria amara
Pertusaria lecanina
Pertusaria leioplaca
Pertusaria pustulata
Pertusaria rubefacta
Pertusaria velata
Phaeophyscia hirsuta
Phaeophyscia orbicularis
Physcia adscendens
Physcia cf. *dubia*
Physcia erumpens
Physcia tribacia
Physciella chloantha
Physconia isidiigera
Placynthium nigrum
Polysporina simplex
Porpidia cf. *thomsonii*
Protoblastenia rupestris
Pseudocyphellaria anomala
Punctelia borreri
Punctelia perreticulata
Pyrrhospora quernea
Ramalina dilacerata
Ramalina farinacea
Ramalina leptocarpha
Ramalina puberulenta
Ramalina subleptocarpha
Rinodina cf. *macrospora*
Rinodina gennarii
Rinodina santae-monicae
Roccellina franciscana
Sarcogyne regularis
Sarea resinae
Schismatomma rediunta
Teloschistes californicus
Teloschistes chrysophthalmus
Teloschistes flavicans
Tephromela atra
Thelomma californicum
Toninia sedifolia
Topelia californica
Trapeliopsis flexuosa
Trapeliopsis granulosa
Tuckermannopsis orbata
Usnea arizonica
Usnea ceratina
Usnea cornuta
Usnea filipendula
Usnea fulvoreagens
Usnea rubicunda
Usnea subfloridana
Usnea wirthii
Verrucaria cf. *aethiobola*
Verrucaria nigrescens
Waynea californica
Xanathoparmelia mougeotii
Xanthomendoza oregana
Xanthoria fulva
Xanthoria parietina
Xanthoria tenax
Xanthoria tenuiloba

Shasta County
Alectoria sarmentosa
Collema furfuraceum
Collema nigrescens
Esslingeriana idahoensis
Flavopunctelia flaventior
Kaernefeltia merrillii
Lecanora fuscescens
Lecidea tessellata
Leptogium lichenoides
Melanelia glabra
Melanelia subolivacea
Normandina pulchella
Parmelina quercina
Physcia adscendens
Physcia aipolia
Physcia tenella
Physconia americana
Physconia enteroxantha
Physconia perisidiosa
Punctelia perreticulata
Punctelia subrudecta
Usnea filipendula
Waynea californica
Xanthoria polycarpa

Sonoma County
Bryoria spiralifera
Caloplaca chrysophthalma
Caloplaca demissa
Candelaria concolor
Catapyrenium psoromoides
Cladonia cervicornis ssp. *verticillata*
Cladonia chlorophaea
Cladonia fimbriata
Cladonia furcata
Cladonia macilenta
Cladonia ochrochlora
Cladonia pyxidata
Coccotrema pocillarium
Collema furfuraceum
Collema nigrescens
Dermatocarpon americanum
Dimelaena radiata
Diploschistes muscorum ssp. *muscorum*
Endocarpon loscosii
Evernia prunastri
Flavoparmelia caperata

Flavopunctelia flaventior
Fuscopannaria leucostictoides
Graphis scripta
Hyperphyscia adglutinata
Hypogymnia enteromorpha
Hypogymnia imshaugii
Hypogymnia physodes
Hypogymnia tubulosa
Hypotrachyna revoluta
Ionaspis alba
Lecanora dispersa
Lecanora muralis
Lecidea atrobrunnea
Leptochidium albociliatum
Leptogium corniculatum
Leptogium lichenoides
Lobaria pulmonaria
Melanelia elegantula
Melanelia subaurifera
Neofuscelia verruculifera
Nephroma helveticum
Nephroma laevigatum
Normandina pulchella
Ochrolechia subpallescens
Parmelia saxatilis
Parmelia sulcata
Parmeliella cyanolepra
Parmelina quercina
Parmotrema chinense
Parmotrema stuppeum
Peltigera canina
Peltigera collina
Peltigera membranacea
Pertusaria amara
Phaeophyscia cernohorskyi
Physcia adscendens
Physcia aipolia
Physcia biziana
Physcia dubia
Physcia phaea
Physcia stellaris
Physcia tenella
Physconia americana
Physconia isidiigera
Pilophorus acicularis
Pseudocyphellaria anomala
Pseudocyphellaria anthraspis
Punctelia perreticulata
Punctelia stictica
Punctelia subrudecta
Ramalina farinacea
Ramalina leptocarpha
Ramalina menziesii
Ramalina thrausta
Solenospora crenata
Sphaerophorus globosus
Sticta fuliginosa
Sticta limbata
Teloschistes chrysophthalmus
Teloschistes exilis
Umbilicaria phaea
Usnea arizonica
Usnea ceratina
Usnea hirta
Usnea longissima
Waynea stoechadiana
Xanthoparmelia cumberlandia
Xanthoparmelia mexicana
Xanthoria candelaria
Xanthoria fallax
Xanthoria parietina
Xanthoria polycarpa

Sutter County
Acarospora socialis
Aspicilia cinerea
Buellia badia
Caloplaca citrina
Caloplaca decipiens
Caloplaca demissa
Caloplaca ignea
Caloplaca subsoluta
Caloplaca tiroliensis
Caloplaca variabilis
Candelaria concolor
Candelariella citrina
Candelariella rosulans
Catapyrenium psoromoides
Cladonia chlorophaea
Cladonia fimbriata
Cladonia pyxidata
Cladonia scabriuscula
Cladonia squamosa
Dimelaena oreina
Diploschistes muscorum ssp. *muscorum*
Diploschistes scruposus
Endocarpon loscosii
Endocarpon pusillum
Evernia prunastri
Flavoparmelia caperata
Flavopunctelia flaventior
Flavopunctelia soredica
Hyperphyscia adglutinata
Lecanora mellea
Lecanora muralis
Lecidea atrobrunnea
Lecidea auriculata
Leptochidium albociliatum
Leptogium californicum
Leptogium lichenoides
Leptogium tenuissimum
Leptogium teretiusculum
Lichinella nigritella
Melanelia glabra
Melanelia glabroides
Melanelia subargentifera
Micarea prasina
Mycocalicium subtile
Neofuscelia verruculifera
Peltula bolanderi
Peltula euploca
Peltula obscurans
Peltula zahlbruckneri
Phaeophyscia orbicularis
Physcia adscendens
Physcia aipolia
Physcia dimidiata
Physcia dubia
Physcia stellaris
Physconia americana
Physconia enteroxantha
Physconia isidiigera
Physconia perisidiosa
Placidium chilense
Placidium lacinulatum
Placynthiella uliginosa
Pleopsidium flavum
Polychidium muscicola
Psora globifera
Psora tuckermanii
Staurothele fissa
Thermutis velutina
Toninia sedifolia
Trapelia coarctata
Trapeliopsis flexuosa
Trapeliopsis granulosa
Umbilicaria phaea
Xanthomendoza fallax
Xanthomendoza mendozae
Xanthoparmelia cumberlandia
Xanthoparmelia mexicana

The Lichens of Cuyamaca Rancho State Park, San Diego County, California

Kerry Knudsen
The Herbarium, Dept. of Botany and Plant Sciences
University of California, Riverside, California 92521
kk999@msn.com

Thomas H. Nash III and William A. Iselin
School of Life Sciences
Arizona State University
P. O. Box 874501
Tempe, AZ 85287-4501

Samantha M. Huggins
Conservation of Natural Sciences
American Museum of Natural History
Central Park West at 79th St
New York, NY 10024-5192

Abstract. One hundred and nineteen lichens in forty-nine genera are reported from Cuyamaca Rancho State Park (CRSP), San Diego County, California. The checklist serves as baseline biodiversity data for future studies in the park, particularly for the recovery of the lichen biota in CRSP after the Cedar fire.

Introduction

Cuyamaca Rancho State Park is located approximately forty miles east of San Diego and is managed by the California State Parks (CSP) system. The park encompasses approximately 26,000 acres, about half of which are designated as Wilderness Area, and is located within the Cuyamaca Mountains of the Peninsular Ranges. Cuyamaca Peak, the second highest point (6,512 feet) in San Diego County, is located in the northwestern portion of the park. The park's name originated with the indigenous Kumeya'ay people, who used the phrase '*Ah-ha-Kwe-ah-mac*' (place of the rain) to describe the area (Anon. 1993).

The Cuyamaca Mountains supported an old-growth forest of conifer and oaks, with only some sections which had burned in the last hundred years. black oak (*Quercus kelloggii* Newb.) and canyon live oak(*Quercus chrysolepis* Liebm.) were abundant with white fir(*Abies concolor* (Gord. & Glend.) Lindl. ex


Cuyamaca Rancho State Park.


Cuyamaca Rancho State Park.

Hildebr.), incense cedar (*Calocedrus decurrens* (Torr.) Florin) Coulter pine (*Pinus coulteri* D. Don), sugar pine (*Pinus lambertiana* Douglas), Jeffrey Pine (*Pinus jeffreyi* Balf.), and ponderosa pine (*Pinus ponderosa* C. Lawson). The predominant rock types are schists, gabbro, and granitic rocks.

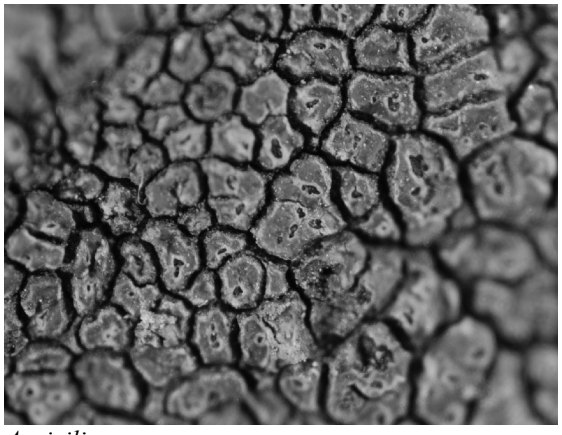
In October of 2003, the human-caused Cedar Fire destroyed 280,278 acres in Southern California and is to date the largest fire in the recorded history of the state (Bowman 2003). Approximately 25,000 acres (101.2 km^2) of Cuyamaca Rancho State Park were incinerated and the conifer and oak forests were devastated.

Methods

In October 2003, Thomas H. Nash III, professor of lichenology and curator of the ASU Lichen Herbarium, led a foray in CRSP comprised of students and members of the California Lichen Society. Specimens were collected and later curated as vouchers for deposit at ASU. Duplicate specimens were provided to the CRSP. In 2005, Kerry Knudsen, curator of the UCR Lichen Herbarium, retraced the foray's route and the forest was almost totally burnt where Nash had collected.

From October-December 2007 Kerry Knudsen performed a survey of the lichens of CRSP for the state park district as part of the San Diego Natural History Museum's Plant Atlas program. There was no observable recovery of the lichen biota from the fire. Lichens were collected from un-burnt trees and rocks throughout CRSP. His specimens are deposited in the Lichen Herbarium at the University of California at Riverside (UCR) and in the herbarium of the San Diego Natural History Museum (SD).

Lichen identifications were primarily made using keys and species descriptions available in the Lichen Flora of the Greater Sonoran Desert Region (Nash et al. 2002; Nash et al. 2004; Nash et al. 2007), although other works were consulted (e.g., Brodo et al. 2001).



Aspicilia cuprea.

Supplementary records were obtained from an online search of the ASU Lichen Herbarium database through the Southwest Environmental Information Network (SEINet; http://seinet.asu.edu/). Some of these records include collections made as part of a study to assess the effects of air pollution on lichen communities associated with conifers in the mountains of southern California (Sigal and Nash 1983).

The majority of these records are collections made by T.H. Nash III or Bruce D. Ryan or Kerry Knudsen and are indicated by the initials THN or BDR or KK, respectively. The remainders cite the collector by last name only.

The species included in the checklist cite the collector and collection number in parenthesis, as well as the date of the collections of Nash and Ryan, followed by limited substrate or location information. Fuller information can be obtained by accessing the collections in the online databases of the ASU Lichen Herbarium at http://seinet.asu.edu/seinet/collections/index.jsp and UCR Lichen Herbarium at http://sanders5.ucr.edu/lichensflat_index.php. The checklist also includes six species, cited by Sigal and Nash (1983) as occurring in CRSP, for which voucher specimens could not be located in ASU. These entries in the checklist lack definitive data and only cite the source of the record.

Checklist for Cuyamaca

119 lichen species in 49 genera. Lichenicolous fungi are listed separately.

Acarospora badiofusca (Nyl.) Th. Fr. (KK9188). Infrequent on boulders.

Acarospora bullata Anzi (KK9099, 9103). Common on boulders.

Acarospora elevata H. Magn. (KK9090). Infrequent on granite.

Acarospora fuscata (Schrad.) Th. Fr. (KK9076). Infrequent on granite.

Acarospora socialis H. Magn. (KK9062, 9061). Common on granite.

Acarospora thamnina (Tuck.) Herre (KK9057). Infrequent on granite.

Acarospora veronensis A. Massal (KK 9038). Infrequent on granite.

Aspicilia confusa Owe-Larss. & A. Nordin (KK9056, 9123B, 9048B, 9207, 9181). Common on boulders throughout park.

Aspicilia cuprea Owe-Larss. & A. Nordin (KK9045, 9051, 9116, 9178, 9123, 9079). Common on boulders throughout park.

Aspicilia cyanescens Owe-Larss. & A. Nordin (KK9129, 9126, 9141, 9195, 9196.1). Dominant *Aspicilia* on Cuyamaca Peak above 5000 feet on granite and conifer bark.

Aspicilia phaea Owe-Larss. & A. Nordin (TH Nash 44011– Oct 2003; KK9176) Frequent on granite

Bryoria cf. *fremontii* (Tuck.) Brodo & D. Hawksw. (Sigal and Nash 1983).

Buellia concinna Th. Fr. (THN14654, 14655 – Sep 1977). N end of CRSP.

Buellia dispersa A. Massal. (THN44012 – Oct 2003). On granite schist.

Buellia spuria (Schaer.) Anzi (KK9144; 9144.1, 9125). On granite. Restricted to top of Cuyamaca Peak.

Caloplaca cerina (Ehrh. ex Hedw.) Th. Fr. (THN 44013 – Oct 2003; KK9202.4). On black oak bark and white fir bark.

Caloplaca citrina (Hoffm.) Th. Fries, *s. lato.* (KK9202). On conifer bark. Cuyamaca Peak.

Caloplaca crenulatella (Nyl.) Oliv. (KK9085). Frequent on boulders in drainages.

Caloplaca nashii Nav.-Ros., Gaya & Hladun (KK3467). Rare on low boulder in grassland.

Caloplaca saxicola (Hoffm.) Nordin (KK9098, 9122). Frequent on boulders in open, sunny locations.

Caloplaca squamosa (B. de Lesd.) Zahlbr. (KK9118). Common on boulders.

Caloplaca stellata Wetmore & Kärnefelt (KK9067, 9119). Common in shaded crevices in oak woodland.

Caloplaca subsoluta (Nyl.) Zahlbr. (KK9047, 9060) Frequent on granite.

Candelaria concolor (Dicks.) Stein (KK9053). Common on bark of shrubs and trees.

Candelariella aurella (Hoffm.) Zahlbr. (KK9039, 9210, 9166). Common on granite.

Candelariella rosulans (Mull. Arg.) Zahlbr. (KK9054). Frequent on boulders.

Candelariella vitellina (Hoffm.) Müll. Arg. (THN44017 – Oct 2003; KK9105, 9173, 9203). Common on granite.

Chrysothrix candelaris (L.) J.R. Laundon (THN44018 – Oct 2003). On fir bark. N and E slope of Cuyamaca Peak below lookout tower.

Cladonia chlorophaea (Flörke ex Sommerf.) Spreng. (THN44020 – Oct 2003). On burned stump. N and E slope of Cuyamaca Peak below lookout tower.

Cladonia fimbriata (L.) Fr. (THN44019 – Oct 2003). N and E slope of Cuyamaca Peak below lookout tower.

Collema furfuraceum (Arnold) Du Rietz (THN44021 – Oct 2003). On oak bark. N and E slope of Cuyamaca Peak below lookout tower.

Collema nigrescens (Hudson) DC. (THN14650 – Sep 1977; THN44022 – Oct 2003; KK 9034.1). On black oak bark. N and E slope of Cuyamaca Peak below lookout tower.

Dermatocarpon americanum Vain. (THN44023 – Oct 2003; KK 9187). Common on schist and granite in drainages.

Dimelaena oreina (Ach.) Norman (KK9075, 9121). Frequent on granite.

Dimelaena thysanota (Tuck.) Hale & W.L. Culb. (THN44024 – Oct 2003; KK9064, 9067, 9097). Common on granite and schist.

Hypocenomyce castaneocinerea (Räsänen) Timdal (THN44059 – Oct 2003). On burned oak stump. N and E slope of Cuyamaca Peak below lookout tower.

Hypocenomyce scalaris (Ach. ex Lilj.) M. Choisy (THN44025 – Oct 2003). On burned stump. N and E slope of Cuyamaca Peak below lookout tower.

Hypocenomyce sierrae Timdal (THN44026 – Oct 2003). On burned stump. N and E slope of Cuyamaca Peak below lookout tower.

Hypogymnia imshaugii Krog. (BDR25754, 25755, 25762 – Sep 1989; THN44038, 44070 Oct 2003; KK9159, 9242). N part of CRSP near campground at reservoir; N and E slope of Cuyamaca Peak below lookout tower..

Aspicilia cyanescens.

Kaernefeltia merrillii (Du Rietz) A. Thell & Goward (BDR 25751 – Sep 1989). On Jeffrey pine. N part of CRSP, near campground at the reservoir.

Lecanora allophana (Ach.) Nyl. (THN44027 – Oct 2003; KK3670, 9199). On fir and Black Oak..

Lecanora austrocalifornica Lendemer & K. Knudsen, in ed. (KK9042) An usnic acid species with fumarprotocetraric acid on twigs of Jeffery pine near reservoir. This species also occurs in the Laguna Mountains and in Riverside County in San Jacinto Mountains.

Lecanora carpinea (L.) Vain. (THN44028 – Oct 2003). On incense cedar stump. N and E slope of Cuyamaca Peak below the lookout tower.

Lecanora chlarotera Nyl. (THN44064 – Oct 2003). On Black Oak. N and E slope of Cuyamaca Peak below the lookout tower.

Lecanora circumborealis Brodo & Vitik. (BDR25757a – Sep 1989). N part of CRSP.

Lecanora garovaglii (Körb.) Zahlbr. (KK9204). Infrequent on Cuyamaca Peak.

Lecanora hybocarpa (Tuck.) Brodo (KK9033). Rare on conifer bark.

Lecanora mellea W. A. Weber (THN14653 – Sep 1977; KK 9077, 9074.1.). Rare on granite.

Lecanora muralis (Schreb.) Rabenh. (KK9044, 9087). Abundant.

Lecanora rupicola (L.) Zahlbr. (KK9070, 9100, 9142). Common.

Lecanora sierrae Ryan & Nash (KK9149). Frequent on Cuyamaca Peak.

Lecidea atrobrunnea (Lam. & DC.) Schaer. (KK9170, 9117, 9241) ssp. *atrobrunnea.* Common.

Lecidea laboriosa Müll. Arg (THN44065 – Oct 2003; KK9081, 9174, 9113). Common on granite.

Lecidea tessellata Flörke (THN44029 – Oct 2003; KK 9077.1, 9102). On schist. N and E slope of Cuyamaca Peak below the lookout tower.

Lecidea truckeei Herre. (KK9072, 9185, 9109). Syn. *Lecidea schizopeltica* (Lendemer & Knudsen 2007). Frequent on Cuyamaca Peak.

Lecidella asema (Nyl.) Knoph & Hertel (THN44032, 44033, 44034 – Oct 2003; KK 9184, 9110, 9169). Common on black oak and granite.

Lecidella elaeochroma (Arh.) M. Choisy (BDR25771 – Sep 1989). N part of CRSP near campground at the reservoir.

Lecidella euphorea (Flörke) Hertel (THN44031 – Oct 2003; KK9201). On white fir. N and E slope of Cuyamaca Peak below lookout tower.

Lecidella stigmatea (Arh.) Hertel and Leuckert (THN44047 – Oct 2003; KK9208, 9115). Common on granite and schist.

Lepraria alpina (de Lesd.) Tretiach & Baruffo. (KK3468). Found intact on boulder in Azalea Glen after fire in devastated area.

Lepraria borealis Lohtander and Tønsberg (THN44035 – Oct 2003; KK9069). On granite and burnt stump.

Lepraria caesioalba (de Lesd.) J.R. Laundon (KK9153) Chemotype IV with stictic acid. Rare on top of Cuyamaca Peak.

Lepraria friablis Lendemer & K. Knudsen (KK9205). Rare on Jeffery Pine.

Leptochidium albociliatum (Desm.) M. Choisy (THN14651 – Sep 1977; THN 44036 – Oct 2003). On granite boulder. N and E slope of Cuyamaca Peak below the lookout tower.

Leptogium californicum Tuck. (THN14652 – Sep 1977). N end of CRSP.

Letharia columbiana (Nutt.) J.W. Thomson (BDR25753, 25759 – Sep 1989; THN44037 Oct 2003; KK9049.2). On Jeffrey pine. N and E slope of Cuyamaca Peak below the lookout tower.

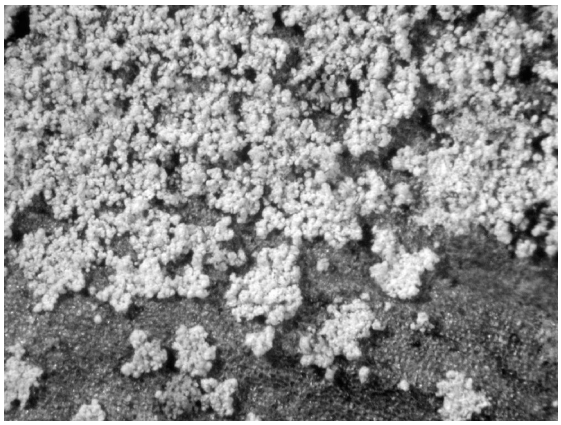
Letharia vulpina (L.) Hue (Sigal and Nash 1983; KK9155, 9158, 9243) Cuyamaca Peak. On conifers.

Megaspora verrucosa ssp. *mutabilis* (Ach.) T.H. Nash (Huggins 14 – Oct 2003; THN44039 – Oct 2003; KK9197). On Black Oak.

Melanelixia glabra (Schaer.) O. Blanco et. al. (BDR25764; THN44041, 4402 – Oct 2003; KK9034). On Black Oak.

Melanohalea elegantula (Zahlbr.) O. Blanco et. al. (Sigal and Nash 1983). On granite.

Melanohalea subolivacea (Nyl.) O. Blanco et al. (BDR25761, 25770 – Sep 1989; KK 9104). On oak and conifer bark.



Lepraria friabilis.

Micarea denigrata (Fr.) Hedl.(THN44040 – Oct 2003). N and E slope of Cuyamaca Peak below lookout tower.

Miriquidica scotopholis (Tuck.) B.D.Ryan & Timdal (KK9048.1, 9106, 9050, 9077.2, 9125, 9050. Common on granite.

Nodobryoria abbreviata (Müll. Arg.) Common & Brodo (Sigal and Nash 1983).

Ochrolechia androgyna (Hoffm.) Arnold (THN44043 – Oct 2003). On conifer bark. N and E slope of Cuyamaca Peak below the lookout tower.

Ochrolechia africana Vaino (KK 9161). Rare on conifer bark on Cuyamaca Peak.

Parmelia sulcata Taylor (THN 44044 – Oct 2003; KK9035). On oak. N and E slope of Cuyamaca Peak below lookout tower.

Parmelina coleae Argüello & A. Crespo (BDR25753b – Sep 1989). N part of CRSP near campground, at the reservoir.

Peltigera praetextata (Flörke ex Sommerf.) Vain. (THN44045 – Oct 2003). On granite boulder. N and E slope of Cuyamaca Peak below the lookout tower.

Pertusaria albescens (Hudson) M. Choisy & Werner (THN 44046 – Oct 2003: KK 9202.1). On fir. N and E slope of Cuyamaca Peak below the lookout tower.

Pertusaria amara (Ach.) Nyl. (THN44048 – Oct 2003). On Black Oak. N and E slope of Cuyamaca Peak below lookout tower.

Phaeophyscia decolor (Kashiw.) Essl. (KK9068). Rare on Cuyamaca Peak. On granite.

Phaeophyscia hirsuta (Mereschk.) Moberg (THN44049 – Oct 2003). On Canyon Live Oak. N and E slope of Cuyamaca Peak below the lookout tower.

Physcia adscendens (Th. Fr.) H. Olivier (THN44050 – Oct 2003; KK9036.1, 9160). On Black Oak. Common.

Physcia aipolia (Ehrh. ex Humb.) Fürnr. (THN44051 – Oct 2003; KK9031, 9036.1). On Canyon Live Oak. N and E slope of Cuyamaca Peak below the lookout tower.

Physcia biziana (A. Massal.) Zahlbr. (THN44052 – Oct 2003; KK9089). On Canyon Live Oak. N and E slope of Cuyamaca Peak below lookout water tower.

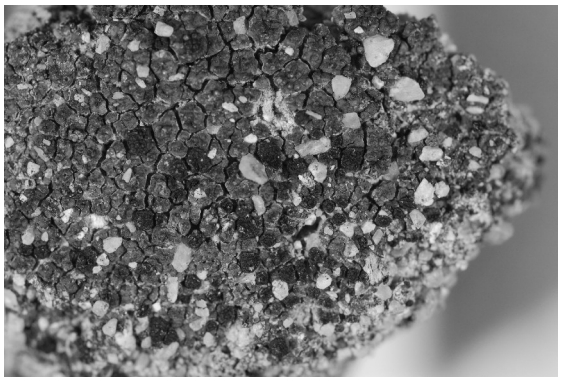
Physcia dimidiata (Arnold) Nyl. (KK9144). Frequent on granite.

Physcia phaea (Tuck.) J.W. Thomson (KK9058). Infrequent on granite.

Physcia stellaris (L.) Nyl. (THN44052 – Oct 2003). On oak. N and E slope of Cuyamaca Peak below lookout tower.

Physcia tenella (Scop.) DC. (BDR25766, 25769 – Sep 1989; KK3466, 9189). N. part of CRSP. Ryan specimens determined by Moberg.

Physconia americana Essl. (BDR25756 – Sep 1989; THN44053 – Oct 2003; KK9034.2, 9167C). Common on bark.



Polysporina subfuscescens.

Physconia californica Essl. (THN44066 – Oct 2003; 9192). On black oak and conifer bark. N and E slope of Cuyamaca Peak below the lookout tower.

Physconia enteroxantha (Nyl.) Poelt (BDR25758, 25765, 25772 – Sep 1989). N part of CRSP near campground at the reservoir.

Physconia fallax Essl. (THN44068 – Oct 2003). On Black Oak. N and E slope of Cuyamaca Peak below the lookout tower.

Physconia isidiigera (Zahlbr. ex Herre) Essl. (KK9037, 9191). Frequent on rock and oak bark.

Platismatia glauca (L.) W.L. Culb. & C.F. Culb. (Sigal and Nash 1983).

Pleopsidium flavum (Bellardi) Körber (KK9240). Infrequent on gabbro on Cuyamaca Peak.

Punctelia perreticulata (Räsänen) G. Wilh. & Ladd (THN44054 – Oct 2003). On fir. N and E slope of Cuyamaca Peak below the lookout tower.

Rhizocarpon bolanderi (Tuck.) Herre (BDR25757b – Sep 1989; THN44058 – Oct 2003). On granite schist. N and E slope of Cuyamaca Peak below the lookout tower.

Rhizoplaca chrysoleuca (Sm.) Zopf. (KK 9105A, 9105). Frequent on granite.

Rhizoplaca glaucophana (Hasse) W.A. Weber (BDR25757 – Sep 1989; THN44058 – Oct 2003; KK 9179). On granite.

Rinodina glauca Ropin (THN44055, 44056, 44057 – Oct 2003). On fir stump. N and E slope of Cuyamaca Peak below the lookout tower.

Rinodina santae-monicae H. Magn. (KK9202C). Common on bark.

Trapeliopsis flexuosa (Fr.) Coppins & P. James (THN44060 – Oct 2003). On incense cedar stump. N and E slope of Cuyamaca Peak below the lookout tower.

Umbilicaria phaea Tuck. (KK9063, 9133, 9101). Common.

Verrucaria furfuracea (de Lesd.) Breuss (KK9043). Frequent including on concrete drain in campground.

Verrucaria sphaerospora Anzi (KK9082, 9196.2). Parasitic lichen on saxicolous lichens.

Vulpicida canadensis (Räsänen) J. E. Mattsson & M.J. Lai (Sigal and Nash 1983).

Xanthomendoza fallax (Hepp) Sochting, Karnefelt & Kondratuk (BDR25703, 25763 – Sep 1989: KK9032.2, 9040). Common on bark and rarely rock.

Xanthomendoza fulva (Hoffm.) Sochting, Karnefelt & Kondratuk (THN44062 – Oct 2003). On bark. N and E slope of Cuyamaca Peak below lookout tower.

Xanthomendoza oregana (Gyeln.) Sochting, Karnefelt & Kondratuk (BDR25760 – Sep 1989; KK9132). N and E slope of Cuamaca Peak below lookout tower on oak and conifer bark.

Xanthoparmelia cumberlandia (Gyeln.) Hale (THN44063, – Oct 2003; KK9222). Common.

Xanthoparmelia lineola (E.C. Berry) Hale (KK9049, 9157, 9112, 9049A, 9052, 9114). Common.

Xanthoparmelia mexicana (Gyeln.) Hale (THN44061 – Oct 2003; KK9059, 9175). Frequent on granite.

Xanthoparmelia novamexicana (Gyeln.) Hale (KK9088, 9206). Frequent on granite.

Xanthoparmelia oleosa (Elix & P.M. Armstr.) Hale (KK9095). Rare on granite..

Xanthoparmelia subplitti Hale (KK9173). Frequent on granite.

Xanthoparmelia wyomingica (Gyeln.) Hale (KK9165). Infrequent on schist. Cuyamaca Peak.

Xanthoria polycarpa (Ehr.) Fr. (KK9032.1). Common on bark.

Lichenicolous Fungi

Arthonia varians (Davies) Nyl. (KK9138). On apothecia of *Lecanora rupicola* on Cuyamaca Peak.

Lichenochora verrucicola (Wedd.) Nik. Hoffm. & Hafellner (KK9078). Infrequent on *Aspicilia cuprea*.

Lichenoconium erodens M. S. Christ. & D. Hawksw. (KK9198) on *Lecanora* species. Determined by Jana Kocourková.

Lichenostigma cosmopolites Hafellner & Calat. (KK9080). Common on *Xanthoparmelia* species.

Muellerella ventosicola (Mudd.) D. Hawksw. (KK9092.2). Common on various lichens on Cuyamaca Peak.

Polysporina subfuscescens (Nyl.) K. Knudsen & Kocourk. (KK9086). Unknown host.

Sphaerellothecium abditum Triebel (KK9135). On *Lecidea atrobrunnea* on top of Cuyamaca Peak.

Stigmidium squamariae (de Lesd.) Cl. Roux & Triebel (KK9218). On apothecia of *Lecanora muralis*.

Conclusions

The lichen flora of CRSP was devastated by the Cedar Fire. Major phorophytes were destroyed and lichens on rocks were often incinerated too.

The populations of corticolous lichen communities are restricted to remaining trees that survived the fire and populations are highly reduced. The following lichens occurring on conifer and oak trees were not found during Kerry Knudsen's survey: *Chrysothrix candelaris, Collema furfuraceum Kaernefeltia merrillii, Lecanora carpinea, L. chlarotera, L. circumborealis, Lecidella elaeochroma, Melanohalea subolivacea, Micarea denigrata, Ochrolechia androgyna, Parmelina coleae, Pertusaria amara*, *Physcia stellaris, Physconia californica, P. enteroxantha, P. fallax, Punctelia perreticulata, Rinodina glauca,* and *Xanthoria fulva.* All of these lichens were common or frequent before the Cedar Fire, and small populations are expected to have survived scattered across the forest. No *Usnea* were collected before the fire, though several common species, especially *U. hirta* (L.) F. H. Wigg. and *U. lapponica* Vain. are locally common in southern California mountains and would have been expected in the forest prior to the Cedar Fire. Three genera of lichens that would have thrived in the understory of the old-growth forest on detritus and moss collected by Nash, and were not found by Knudsen: *Cladonia, Leptogium,* and *Peltigera* as well as the usually common *Leptochidium albociliatum*. All lichenicolous fungi were collected on saxicolous lichens except for the extremely common *Lichenoconium erodens,* which is probably saprobic. We would have expected to have found at least a

dozen species of lichenicolous fungi on corticolous macrolichens. No *Hypocenomyce* species or *Lepraria* species were found on burnt wood from the Cedar fire but species of these genera are expected to eventually pioneer the newly carbonized wood.

The mountains of southern California are more arid than the Sierra Nevada and the mountains of northern California with long hot summers and infrequent summer thunderstorms. Many macrolichen species common from central California north are apparently naturally rare in the southern California mountains, though air pollution and anthropogenic fire may have contributed to rarity. The Sigal and Nash study reports from CRSP the following species : *Bryoria* cf. *fremontii*, *Nodobryoria abbreviata, Platismatia glauca,* and *Vulpicida canadensis*. Only *Nodobryoria abbreviata* is locally common in Laguna Mountains in San Diego County. These four species may now be extinct in the Cuyamaca Mountains.

During the Cedar fire, lichens were incinerated on rocks and boulders surrounded by trees or littered with fallen leafs or branches. Many lichen-covered boulders below 5000 feet exist in openings in the forest or in the grassland areas and were not burned. Cuyamaca Peak supported a different mixture of saxicolous species above about 5000 feet, with *Aspicilia cyanescens* and *Lecanora sierrae* being good indicators of this upper montane community. Nonetheless, the burn at the top of the Peak was uneven and many lichen populations on trees as well as boulders survived.

Post-fire lichen recovery in the southern California mountains has not been studied. Based on subjective observations of post-fire recovery in the Cuyamaca Mountains as well as the San Jacinto, Santa Ana and Santa Monica Mountains, lichen recovery seems to be extremely slow in southern California's Mediterranean climate, probably on time scales of thirty years or more. Part of the recovery of the lichen flora in CRSP is dependent on success and speed of conifer revegetation. Twelve species in this report were found only on conifer bark. Apparently there was little substantial damage overall to saxicolous lichens. This paper supplies good baseline data of the pre-Cedar Fire lichen flora of the Cuyamaca Mountains. The Cuyamaca Mountains should definitely be monitored for the recovery of corticolous lichens in the future. Lichen recovery from fire definitely deserves fuller study as causes such as population pressures, nitrate deposition, and droughts make fires more frequent and devastating in western North American.

Acknowledgements

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Note on *Peltigera hydrothyria*

Tom Carlberg
1959 Peninsula Drive
Arcata, CA 95521
tcarlberg7@yahoo.com

I recently visited one of two locations of *Peltigera hydrothyria* in the California coast ranges, near the crest of South Fork Mountain. It's a place I've been to several times before, always during the summer months. This time I was able to visit in October, before any of the fall rains came in. I noticed that the seasonal water level in the creek fluctuates quite a bit, which is not surprising. At one point the creek falls over a modest bus-sized boulder, creating a spray zone which is continually wet, but not underwater. *P. hydrothyria* is found in this moist area, as well as in the bed of the creek further upstream.

Figure 1. *Peltigera hydrothyria* on moist vertical rock face near top of South Fork Mountain. Photography by Tom Carlberg.

The thalli in this area had lobes that were noticeably smaller in size than those further upstream, which were entirely immersed all the time. Apothecia seemed to be equally abundant on thalli from both habitats, and the overall health of the non-immersed thalli seemed very good, with no necrotic tissue or other signs of water stress noted. Aside from smaller lobes, the only apparent difference was that thalli from the spray zone had larger numbers of lobes per thallus than those from further upstream.

Peltigera hydrothyria is generally regarded as being entirely aquatic, like *Leptogium rivale*, which is also found in California, but unlike aquatic species of *Dermatocarpon*, which can be found either in creeks and ponds, or in dry areas along the banks of streams. This report of *P. hydrothyria* growing in a moist but not wet area demonstrates that there is a gradient involved in the moisture requirements of this lichen.

Figure 2. Closeup of small-lobed *P. hydrothyria*. Photography by Tom Carlberg. Printed in color on back cover.

Figure 3. "Normal" *P. hydrothyria*. Photography by Richard Doell. Printed in color on back cover.

A Preliminary Observation of Ascomatal Longevity in *Calicium viride*

Eric B. Peterson
California Native Plant Society
2707 K Street, suite 1, Sacramento, CA 95816
eric@theothersideofthenet.com

Although lichens are commonly thought of as slow growing organisms, surprisingly little specific information is available on the growth rates and longevity of lichens or their structures. Most of what is known is about the use of slow growth rates of saxicolous lichens for archeological dating. However, some lichens have been demonstrated to grow rather fast, such as *Usnea longissima* increasing in biomass by up to 30% per year (Keon & Muir 2002).

Calicioid lichens (or pin-lichens) are well known for their association with old substrates, though the reason for this association has only been speculated upon. They grow primarily in sheltered areas on tree trunks, avoiding direct interception of liquid water. This may suggest a stress-tolerant life strategy (Grime 1974) where they avoid competition from other lichens and mosses by growing in sites that are inhospitable to most. This would imply a slow rate of growth. Furthermore, calicioids put a lot of biomass into producing their stalked ascomata. For a slow growing organism to make such an investment, one might speculate that the investment should be long-term. But again, there appears to be no real data on this.

Last year I initiated a small test that might address the question of ascomatal longevity in calicioids. I photographed a small patch of *Calicium viride* with several ascomata of variable size (Fig 1). Then returned this year and re-photographed the same patch at approximately the same angle (Fig 2). The second photograph shows the same ascomata with little change (arrows). The largest (A) is nearly indistinguishable between the photographs while the next largest (B) appears that it may have grown slightly. Smaller ascomata are not clear enough to show small changes, and no new ascomata appear to have formed. The exceptionally dry spring might have slowed growth, and the surrounding thalli of *Letharia vulpina* also show rather little growth. Still, the similarity of the photographs provides strong evidence that the ascomata of *Calicium viride* are perennial over many years.

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Fig 1. *Calicium viride*, November 29, 2007.

Fig. 2. *Calicium viride*, September 7, 2008.

Basic Lichenology: Growth Forms

Eric B. Peterson
California Native Plant Society
2707 K Street, suite 1, Sacramento, CA 95816
eric@theothersideofthenet.com

Preface: With this paper, I will begin a series on basic lichenology for the Bulletin. Also, I do not intend for the series to be just written by myself; I invite everyone to write contributions and there is no reason we couldn't print multiple installments of Basic Lichenology within an issue. Topics may range from morphological characters like in this installment, to a discussion of an interesting species, to ecological or even chemical principals.

The body of a lichen is referred to as its thallus. This includes everything except the fruiting body (spore producing structure). Generally we regard a single thallus to be a lichen 'individual'. Exceptions exist, however, both on one hand due to their clonal nature (a whole patch of lichen thalli may be a single genetic individual much like a grove of Aspen trees) and possibly the other hand as in some cases it appears that a single thallus can have genetic variation that implies multiple individuals forming a single body.

One more caveat: within the lichen relationship, the fungal portion makes up the bulk of the thallus and seems to be the component that ultimately controls the form that the thallus takes. Thus what we see as 'species of lichens' are generally species of fungi. As for the algae, there are generally numerous clusters of cells within the thallus and thus numerous algal individuals.

A caveat to my caveat: without the algae, the fungus appears to be incapable of manifesting its normal thallus form, and the fungus can associate with different algae resulting in different thallus forms. Oh, and not all algae are algae... blue-green algae, better referred to as cyanobacteria, are a completely different kingdom and as a result we often speak of photobionts rather than specifying algae or

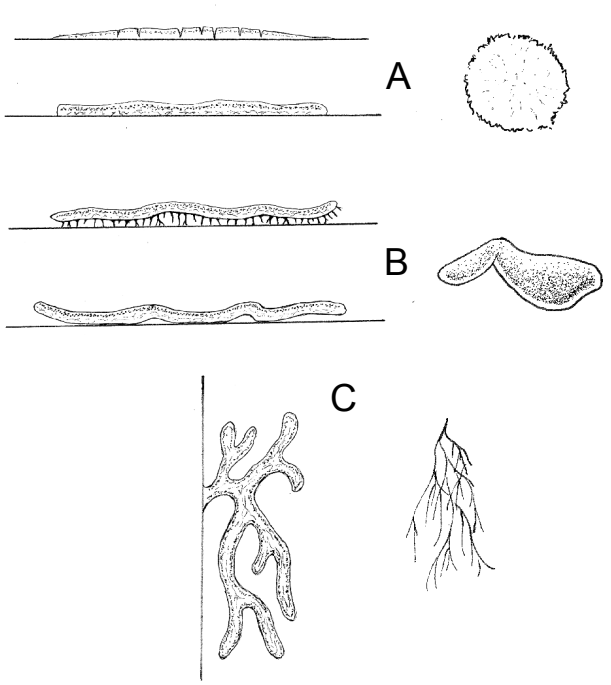


Figure 1: General growth forms of lichens: (A) crustose, (B) foliose, and (C) fruticose. Cross sections are shown on the left; an external view on the right.

cyanobacteria. And speaking of bacteria, there is on-going research at Duke University suggesting that other bacteria may be integral to the formation of a lichen thallus.

Are you starting to think there are an awful lot of exceptions? Yes there are. Lichens may be small, but they are not simple. Caveats are common and oddities are normal. But this is half the fun of exploring the world of lichens. I will try to keep this discussion simple and thus will rely on generalities. Just don't forget, exceptions can be found to almost any simple statement.

On with the growth form of lichens...

We often hear of three basic growth forms: crustose, foliose, and fruticose (Fig. 1). There are convenient analogies to use to describe these: crustose are paint-like; foliose are leafy; and fruticose are shrubby. Another way to think of it is in dimensionality: crustose are barely more than 2-D; fruticose are fully 3-D, and foliose would be about 2.5-D. Let's examine each in more detail.

Crustose lichens do not have a lower surface. Their lower extremities are fungal hyphae adhering to a surface or even becoming embedded within a surface. We generally think of them forming a layer over a surface, forming a crust over bark, wood, rock, soil (primarily in arid climates), or leaves (primarily in humid tropical climates). Some crustose lichens can be almost entirely embedded within a substrate. A number of pin-lichens have their thallus embedded in bark and wood with only a slight discoloring of the surface and their unusual stalked fruiting bodies to indicate their presence. A variety of lichens even grow within the surface of rock, sometimes to a depth of a centimeter or more, with their fruiting bodies being the only outward sign of their presence.

Foliose lichens are defined as lichens with a lower surface, and the lower surface usually differs from the upper surface. In stratified lichens, the photobionts are generally concentrated near the upper surface. The classic pattern is (top to bottom): upper cortex, photobiont layer, medulla, lower cortex (Fig. 2). Cyanobacteria may form a layer much like algae typically do, or they may be clustered in cephalodia. Non-stratified, or gelatinose, lichens could almost be distinguished as a fourth growth form, where the medulla and photobionts fully intermixed and forming a solid mass rather than the open cottony structure of stratified lichens. In *Collema* there isn't even a distinct cortex layer (Fig. 3).

Fruticose lichens rise above their substrate with a typically branched structure where upper and lower surfaces cannot be distinguished. Most of these are quite large and obvious in their fruticose structure, but some are quite small, forming minutely fruticose thalli. Some are thin and hair-like, others are stoutly branched. Some have effectively innumerable branchings, others may have only a single trunk-like structure. But in general, fruticose is probably the most distinctive of the three basic growth forms.

So what kinds of exceptions can be found? If you can imagine it, then some lichen probably has evolved it. There are intermediates like *Evernia prunastri* which could be foliose in that its lobes are mostly flattened and algae concentrate more on one side than the other, but layering is weak and at a glance, most people would classify it as fruticose. Even more surprising intermediates exist. The genus *Aspicilia* is primarily crustose, but a few species form small fruticose thalli and some will even form a crust that thickens in places and forms fruticose outgrowths. Some people regard pin-lichens as fruticose, but the upright structure they claim makes them fruticose is formed by extension of particular tissues in the fruiting body so I suggest these are crustose with stalked ascomata.

Then there are things that don't really fit well with any of the three simple categories. A large number of lichens are often referred to as squamulose – sort of between crustose and foliose and often forming a shingle-like pattern. *Lepraria* and similar groups are often classified as crustose though many have little or no adherence to a substrate – a better description would be 'dust-like'... 'dustose?' And then there is the popular genus *Cladonia*, which has two forms within typical thalli: lobes that are foliose to squamulose, and podetia that are fruticose.

Then, there is the question “Why?” What reason is there to these various growth forms? I imagine that many hypotheses might be postulated here, but I typically think of two reasons: competition and water interception. Foliose lichens are particularly effective at growing over crustose species, thus out competing them for light and possibly for air too. Increasing thallus dimensionality results in an increase in the surface to volume ratio, improving a lichens interception of water, though decreasing its ability to retain water. As a result, dimensionality tends to correlate with humidity. In deserts, most lichens have a water-conserving crustose form. Moister climates have more foliose and fruticose lichens. And many fruticose species are concentrated in areas where fog is common.

Under the Lens

Bahia Preserve, Marin Co. September 7, 2008

Daniel Kushner, Ken Howard, John Fedorchek, and I did the Bahia Preserve field trip. The intent was to search for *Leptogium siskiyouensis*, a recently described species which has been found in southern Oregon, far northern California, and near Monterey, but not as yet in the Bay area or north coast of California. We hiked the Bahia trail through a forest varying from open with grass cover to fairly dense. Dominant tree species were *Quercus douglasii, Umbellularia californica, Quercus agrifolia*, and *Arctostaphylos manzanita*, with *Quercus kellogii* (the most common *L. siskiyouensis* host) fairly common in places. We didn't find *L. siskiyouensis*, and in fact this site does not seem a likely locale, based on the report at http://www.pnwfungi.org/pdf_files/manuscripts_volume_3/naf20082.pdf, because it is too low in elevation and lacking conifers. Daniel suggested looking in the Mt. Tam area where there are chinquapin (*Chrysolepis chrysophylla*), another species on which *L. siskiyouensis* has been found. Benstein trail from the Rock Spring trailhead may be a good location because it has Douglas-fir and chinquapin.

We had a very nice time and has some good finds of lichens and other things. List below, and photos at http://mcaisse.users.sonic.net/Bahia.

LICHENS: On blue oak: *Ramalina menziesii, R. leptocarpha, Leproloma* sp.*, Punctelia subrudecta, Xanthomendoza oregana, Xanthoria tenax, Teloschistes chrysophthalmus, Physcia adscendens, Physcia* sp. (soredia + apothecia), *Physconia isidiigera*, *Ochrolechia* (*subpallescens*?) On black oak: *Collema nigrescens, Lepraria* sp. On manzanita: *Ramalina farinacea*. On coast live oak: *Arthonia pruinata*. On concrete: *Lecanora muralis*, *Lecanora* (*gangalioides*?), *Caloplaca* sp.

TREES: Blue oak (*Quercus douglasii*), black oak (*Quercus kellogii*), coast live oak (*Quercus agrifolia*), interior live oak (*Quercus wislizenii*), California bay (*Umbellularia californica* - madrone (*Arbutus menziesii*), California buckeye (*Aesculus californica*), tree of heaven (*Ailanthus* sp. - non-native), *Eucalyptus globulus*.

SHRUBS: *Arctostaphylos manzanita,* Toyon *(Heteromeles arbutifolia)*, California coffeeberry (*Frangula californica*) California honeysuckle (*Lonicera hispidula*) poison oak (*Toxicodendron diversilobum*) coyote bush *(Baccharis pilularis*).

HERBS: Sticky monkeyflower (*Mimulus aurantiacus*), coastal wood fern (*Dryopteris arguta*), snowberry (*Symphoricarpus albus* var. *laevigata*), oak mistletoe (*Phoradendron villosum*), alkali heath (*Frankenia salina*), triangle orache *Atriplex prostrata,* turkey mullein (*Croton setigerus*).

ANIMALS: Scrub Jay, Acorn woodpecker, Dark eyed Junco, Raven, Red Shouldered Hawk, Fence Lizard, Gopher snake.

Reported by Michelle Caisse

Collema nigrescens. Photography by Michelle Caisse

News and Notes

New Address

CALS has a new address! In previous years the Society's address has always been the same as the President's address (no, not *that* President!), which meant that each time we appointed a new President, the Society's address changed. One of the decisions made by the Board of Directors during the meeting in January 2008 was to find a way to have a permanent address.

We have chosen to use an electronic mail box with Earth Class Mail, which can be accessed by our Board officers via the world wide web. Mail sent *to* the Society is mailed in the normal fashion, including membership dues. The hope is that in the future there will never be delays or confusion in communicating with CALS. The new address is:

California Lichen Society
PO Box 7775 #21135
San Francisco, California 94120-7775

Forest Service Lichen Center of Excellence

Cheryl Beyer, CALS Treasurer, has recently been made a Center of Excellence for the Forest Service in California. This appointment results in part because the Forest Service now has lichens on their lists of Sensitive species, which means that they must adjust certain management decisions to ensure the biological persistence of listed species. Some of the species listed as Sensitive are *Peltigera hydrothyria, Usnea longissima, Calicium adspersum,* and *Ramalina thrausta*. The Forest Service's list of Sensitive lichen species is not the same as the Department of Fish and Game's list, although there is some overlap.

Xanthoria pollinarioides at IAL

As many of us already know, the 6th IAL Symposium and Annual ABLS Meeting took place at Asilomar this past July, 2008. One of the high points for CALS members was the discovery of another location for *Xanthoria pollinarioides* L. Lindblom & D. M. Wright (**see photo**). Louise Lindblom had already determined to spend some of her time in the U.S. looking for additional locations, and to the gratification of all, one of the new sites was on the Asilomar grounds, on the smaller branches of some coast live oak (*Quercus agrifolia*) along one of the paths from the beach road out to the beach. Louise states that "I now understand that the species is not extremely rare (but not entirely common either)".

Thank You!

CALS would like to welcome all the new members who decided to join the Society in 2008. We hope that those of you who can will decide to come on a field trip, or drop in during one of the regular workshops at the College of Marin, which take place on the 2nd and 4th Fridays of each month. And if you cannot attend, please remember that we always want to hear about our Members' activities, so consider submitting a report for the Bulletin!

James K. Walton of Alaska, United States
Andrea Borkenhagen of Alberta, Canada
Dr. Helmut Mayrhofer of Austria, Austria
D. Russell Wagner of California, United States
David Norman of California, United States
Elleyne Beals of California, United States
Forest Gauna of California, United States
James B. Cunningham of California, United States

Xanthoria polinarioides at IAL. Photography by Michelle Caisse Printed in color on back cover and an additional photo forms part of the front cover collage.

Jan Hintermeiser of California, United States
Jeremiah Mann of California, United States
Julie K. Nelson of California, United States
Karen M. DeMello of California, United States
Mary Austin of California, United Kingdom
Mary K. Colbert of California, United States
Melissa McDowell of California, United States
Natalie Howe of California, United States
Richard Reese of California, United States
Richard Trout of California, United States
Scott Peden of California, United States
Michele Piercey-Normore of Manitoba, Canada
Elizabeth Kneiper of Massachusetts, United States
Daphne Stone of Oregon, United States

We also want to acknowledge and never forget those Members who have taken the step to become Life Members. This year, Nancy Hillyard and Dan Norris made that decision; thank you! We hope your generosity will continue to bring you satisfaction every time you think of us.

And the same to those Life Members who made the decision in earlier years; we always appreciate your thoughtfulness and dedication to lichens, and to the Society.

Dr. Thorsten Lumbsch
Greg Jirak
Irene Brown
Jacob Sigg
Kathleen Faircloth
Lori Hubbart
Mrs. Ellen Thiers
Sara Blauman
Stella Yang
Trevor Goward
Stephen Buckhout
Susan B. Wainscott

CALS Educational Grants

CALS is committed to supporting research involving lichens in California. You may recall the research that Sarah Jovan (2003) and Suzanne Altermann (2004) published in the Bulletin in the past. The funding for these research projects comes from the generous contributions of our membership dues and donations to CALS education grants. This year the education committee revamped the assessment of proposals and implemented a rubric to consider proposals on equal footing. This rubric was proposed by Jennifer Riddell and approved unanimously by CALS Board members; it quantifies the submissions in several categories based upon the grant requirements published previously in the Bulletin. I would like to thank my fellow members of the education committee for their dedication and hard work this year: Don Reynolds, Shirley Tucker, and Jennifer Riddell. We judged proposals in the following categories: technical, consistency with CALS goals, quality, budget, likelihood of completion, and letter of support. I am happy to announce that this year the Education Committee received several excellent submissions all of, which proposed diverse and important research throughout California. This year, it was truly a difficult decision!

-Erin Maritn, committee chair.

The committee selected the following proposals:

Treasurer's Report

(Previous balance) Sept. 12, 2008 Balance Mechanics	$12,789.50
(Starting balance) 8/6/2008 Balance Wells Fargo	1,000.00
TOTAL BALANCE both banks, 9/12/2008	13,789.50
Current November 18, 2008 Balance Mechanics	7,804.72
Current November 18, 2008 Balance Wells Fargo	4,025.60
TOTAL BALANCE both banks, 11/18/2008	11,830.32
Anticipated Educational Grants to distribute	2,500.00
Anticipated Winter Issue Bulletin costs – estimated	2,000.00
TOTAL BALANCE ANTICIPATED, 1/1/09	7,330.32
TOTAL September 12, 2008 Balance	13,789.52
TOTAL November 18, 2008 Balance	11,830.32
DIFFERENCE IN BALANCE 9/12 – 11/18/2008	1,959.20
Last Mechanics check 10/31/2008 - for deposit to WF	5,000.00
Last Mechanics deposit 7/14/2008	10.00
Last Wells Fargo check 10/31/2008 Unique Printing MG	1,960.00
Last Wells Fargo deposit 10/17/2008	20.00

Name of applicant: **Dr. Matthias Schultz** (schultzm@botanik.uni-hamburg.de)

Project title: **Field studies on critical Lichinaceae (and similar small, cyanobacterial lichens) in western North America, with emphasis on California**.

Purpose: To enhance the knowledge of a poorly known ecological relevant group of lichens, the Lichinaceae. The main objective is to obtain new data on occurrence, distribution, ecology of Lichinaceae in California. Because these lichens occur in a wide range of habitats, new insights may be of high relevance to questions of species conservation and bioindication on both the local and regional scale.

Aspects of particular importance: Potential impact of ammonium pollution to cyanobacterial lichens' ablity to fix atmospheric nitrogen due to the nitrogenase activity of their cyanobacterial photobiont. There are no studies devoted to this aspect known to the applicant which include members of the Lichinaceae. Because these lichens predominantly grow on open rock surfaces in nutrient poor environments they could serve as potentially powerful indicators of ammonium emissions especially in sparsely forested areas with only few epiphytic lichens.

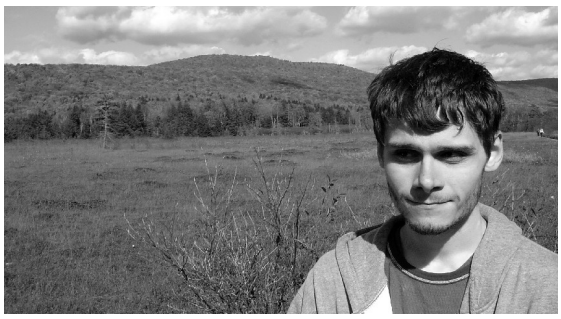
Matthias Schultz, submitted photograph.

Dr. Matthias Schultz received a Ph.D from the University of Kaiserlautern in 2000 for his thesis "Phylogeny and systematics of the Lichinaceae: studies towards a natural concept of the family and genera". His interests include taxonomy, systematics and phylogeny of Lichinaceae (Lichinomycetes) and other small cyanobacterial lichens, and the diversity of lichens of arid and semi-arid regions, especially Arabia. He first became interested in lichens through "accidentally collecting lichens (*Cladonia*) in dune areas at the coast of the Baltic Sea". He is married with 2 children, and is living in Hamburg, Germany.

Name of applicant: **James C. Lendemer** (jlendemer@nybg.org)

Project title: **Studies of the Genus *Lepraria* in California**.

As several species described recently from California are endemic to western North America (e.g. *Lepraria xerophila* Tonsberg, *L. adhaerens* Knudsen et al., *L. santamonicae* Knudsen & Elix), it is crucial that I examine these taxa and conduct SEM studies, DNA extraction/molecular studies, and chemical studies. My thesis is the first attempt to resolve the taxonomic status of North American *Lepraria* species, and will be the first study to take a multi-disciplinary approach incorporating molecular data, chemical data, ecological/habitat data, and micromorphogical data. The Californian species of *Lepraria* are particularly cogent to resolving the generic limits of *Lepraria* because several taxa are morphologically and/or chemically anomalous in the genus. I have already visited California and collected extensive material of *Lepraria* in several parts of the state.



James C. Lendemer, submitted photograph.

James C. Lendemer is a graduate student at the City University of New York and The New York Botanical Garden. He is, in his own words, "a product of the Philadelphia Public School system". He went to the University of Pennsylvania for his undergraduate studies. He also took some classes at the University of Arizona, where he worked for Dr. Thomas H. Nash III. He is primarily interested in the biogeography and taxonomy of lichens and lichenicolous fungi, especially those that occur in North America. He became interested in lichens about six or seven years ago while volunteering for the Academy of Natural Sciences of Philadelphia in an effort to keep himself off the streets. "I thought lichens were the most interesting group and started collecting and identifying them (starting with *Cladonia* was a bad idea)".

Upcoming Events

Ongoing Lichen Identification Workshops
College of Marin, Marin Community College
The Science Center, Room 191
2nd and 4th Fridays, 5:30 to 9:00 pm

We encourage you to attend these regular and interesting workshops at Marin Community College, where you'll encounter enthusiastic lichen students like yourself. Dr. Paul DiSilva has graciously allowed us to use the classroom and scopes. Patti Patterson organizes the logistics. We bring our own lichens and work with each other to identify them. There are usually snacks. Parking at the college is $3, however, there often is free parking on the side road next to the campus. For more information, contact Patti at patti@microweb.com.

CNPS 2009 Conservation Conference
January 17th – 19th, 2009

The California Lichen Society is a Sponsor for the CNPS 2009 Conservation Conference: *Strategies and Solutions*, organized by the California Native Plant Society. The conference takes place in January 2009, starting on the 17th and ending on the 19th, with workshops continuing through the end of the week. We will have a booth at the conference, with information about our Educational Grants program, recent activities of the Conservation Committee, handouts about Bay Area and the upcoming Chico State workshops, and exhibits of lichens. The conference will be attended by botanists, land managers, conservationists, state and federal agency personnel, and passionate flower lovers from all over the state. More information is available at http://www.cnps.org/conservation/conference/2009.

Lichen morphology and taxonomy workshop
Chico State Herbarium
February 28th, 2009, 9am – 4pm.

The Friends of the Chico State Herbarium regularly host workshops on various topics related to botany. These include lectures, labs, and identification and keying sessions on various groups from grasses to fungi. In February 2009 there will be a day-long workshop devoted to foliose and fruticose lichens. It begins with the basics of lichen anatomy, morphology and reproduction, with special attention to some of the quirky interesting things about variations of the symbiosis. A trip to Bidwell Park in Chico will give a concrete grounding to the material covered in the morning, and when everyone returns to the lab to work on their material, there will be dissecting scopes and reference materials to use while exploring your lichens.

Tom Carlberg will facilitate the workshop. Additional information can be found at the Friends of the Chico State herbarium website, at http://www.csuchico.edu/biol/Herb/Events.html.

Northwest Scientific Association
81st Annual Meeting
and
Northwest Lichenologists
Annual General Meeting
March 25 - 28, 2009

The Northwest Scientific Association is holding its 81st Annual Meeting, and as usual it is in conjunction with the Northwest Lichenologists General Meeting. The meeting will be from March 25th to 28th, 2009, at the University of Washington, in Seattle, WA. The theme is *The Pacific Northwest in a Changing Environment*

Symposia and presentations will address a broad range of topics and issues in natural and applied sciences, including climate change, geology, forestry, ecology, botany, restoration and lichenology; typically the lichenology papers occupy about ½ of one day. Additionally, there will be a poster session, field trips, and a social and banquet. There is currently a call for papers. Registration information and a tentive program can be found at the Northwest Scientific Association's home page: http://www.vetmed.wsu.edu/org_NWS/NWSci_Home.htm. Also see Northwest Lichenologists' page at http://home.comcast.net/~nwlichens/events.htm#AnnualGeneralMeeting.

Presidents Message

Winter is usually accompanied by a break in botanical adventures. The wildflowers of spring and summer are at rest, along with many of our deciduous trees and shrubs. However, this season is an amazing time if you happen to be into lichens. As the leaves fall from trees the bright thalli of *Ramalina*, *Usnea*, *Parmelia,* and crustose lichens become more visible. In the mountains, snow piles on top of fluorescent *Letharia* and hungry deer gobble up bits of wind-thrown *Bryoria*. Dry desert crusts take on new dimensions as they soak up the available moisture. Those of us who search for these small creatures are truly lucky. Lichens and bryophytes, although present year-round, seem to become increasingly beautiful in winter.

Winter is also a time of reflection and gratitude. This winter I have often found myself thinking about CALS, specifically what this organization has accomplished and where we are headed in the future. I am honored to be a part of the California Lichen Society. For the past 14 years, CALS members have dedicated their time to the study of lichens through discovery, education, and conservation. Our organization is unique in that it embraces both professional lichenologists/botanists, as well as those who belong to other professions. One thing we all share is a passion for lichens.

This year was a productive year for the lichen society. CALS members participated in several events. Perhaps the largest of these was the International Association of Lichenology (IAL) Conference held in Monterey. CALS volunteers assisted with various activities during the conference, and developed educational displays related to lichens and special habitats found in California, and on the history of our organization. Several conference attendees remarked that they were impressed by the work CALS has accomplished over the years, and the contributions members make to the California lichen flora. We observed many exciting lichens near the conference grounds including our very own “mystery lichen.” This lichen was first reported by CALS member Greg Jirak and later described by Darrell Wright and Louise Lindblom as *Xanthoria pollinarioides* L. Lindblom & D.M. Wright. Members also participated in the Northern California Botany Symposium, CAL day at UC Berkeley, and in the annual MSSF Fungus Fair at the Oakland Museum.

Members took part in several other activities this year, which helped promote an awareness of lichens. Judy Robertson offered a macrolichen workshop at Merrit College in Oakland, and lichen identification workshops are being held twice a month at the Community College of Marin. We led field trips to Mt. Burdell, the Pepperwood Preserve, and the Yana Trail in northern California. In December University Press Books in Berkeley introduced lichens to their Natural History section, and Janet Doell was on hand to talk about the species featured in edition II of “A Mini-guide to some common California lichens”. In the coming year, we hope that you will be able to join us for two upcoming events. CALS is proud to be a sponsor of the California Native Plant Society Conservation Conference January 17-19 in Sacramento. By taking part in this conference, we hope to increase the awareness of lichens among those working in botanical fields, and provide information on rare lichens and special habitats throughout

California. Our annual potluck meeting and field trip will be held on Jan. 31st in the bay area. If you are interested in attending this event or would like to help with its organization please contact the Society's Secretary, Patti Patterson.

We saw renewed interest in our educational grants program and the education committee received several excellent proposals this year. Congratulations to our grant recipients Matthias Shultz and James Lendemer. The results of their work will be published in a future bulletin. We are looking forward to hearing about their research, and funding more research projects in the future.

The conservation committee continues to work with the California Department of Fish and Game to investigate the distributions of lichens and place rare lichens on their list of special taxa. This year members sponsored five lichens: *Bryoria pseudocapillaris, B. spiralifera, Cladonia firma, Peltigera hydrothyria*, and *Sulcaria isidiifera*. These lichens are now in their 1-year review period after which they will be assigned a rank and listing decisions will be made. There are currently several lichens in need of sponsorship. If you would like to sponsor one of these lichens or are curious about which species need sponsorship, please contact Eric Peterson or Tom Carlberg, using the contact info on the inside cover.

The future of CALS continues to looks bright. We have a strong membership base and we hope that our numbers continue to grow. We would like to offer more field trips and hikes throughout the state, especially in areas where the lichen flora is not well known. If you are willing to lead or organize hikes in any part of California please contact me. I would like to encourage members to submit to the bulletin. We are open to publishing scientific findings, field trip reports, general lichen papers, curiosities, and news and notes from members.

In closing, the board and I would like to thank everyone who continues to support CALS. Your membership contributions and volunteered time are what allow our organization to continue to be successful. We wish you a joyous holiday season and the best of luck in the New Year. Happy Lichenizing!

Erin P. Martin

The Bulletin of the California Lichen Society

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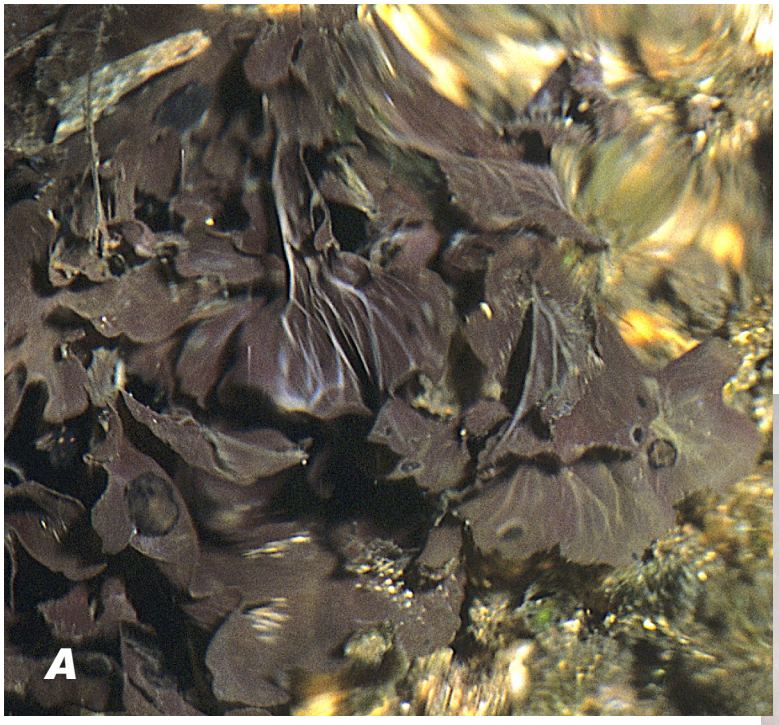
The deadline for submitting material for the Winter 2008 CALS Bulletin is 15 May 2009.

Back cover:

A) "Normal" *P. hydrothyria*. Photography by Richard Doell. See page 50.

B) Closeup of small-lobed *P. hydrothyria*. Photography by Tom Carlberg. See page 50.

C) *Xanthoria polinarioides* at IAL. Photography by Michelle Caisse. See page 55.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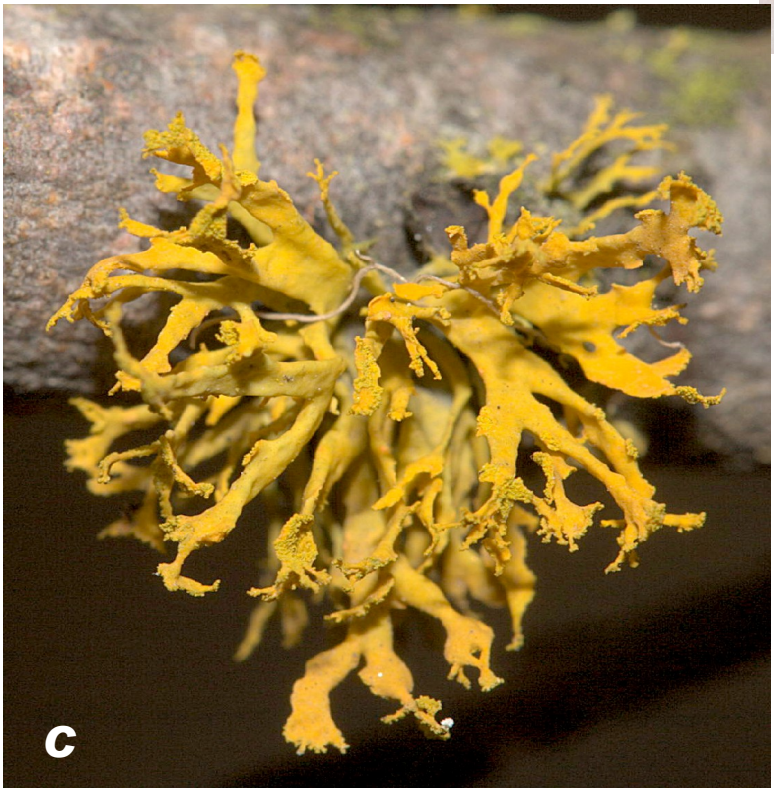
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