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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 Richard Doell. 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 1.44 Mb diskette or a CD in Word Perfect or Microsoft Word formats. Submit a file without paragraph formatting. Figures may be submitted as line drawings, unmounted black and white glossy photos or 35mm negatives or slides (B&W or color). Contact the Production Editor, Richard Doell, at <rdoell@sbcglobal.net> for e-mail requirements in submitting illustrations electronically. A review process is followed. Nomenclature follows Esslinger and Egan's 7th Checklist on-line at <http://www.ndsu.nodak.edu/instruct/esslinge/chcklst/chcklst7.html>. 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. Style follows this issue. Reprints may be ordered and will be provided at a charge equal to the Society's cost. The Bulletin has a World Wide Web site at <http://ucjeps.herb.berkeley.edu/rlmoe/cals.html> and meets at the group website <http://groups.yahoo.com/group/CaliforniaLichens>.

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Front cover: *Solorina spongiosa* (Sm.) Anzi. Photo curtesy of Steve Sharnoff.

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Volume 11 No.1 Summer 2004

Solorina spongiosa: A new species record for Nevada

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Abstract: Solorina spongiosa *("fringed chocolate chip lichen") is reported new to Nevada from the Spring Mountains where it grows over and among several species of mosses at elevations above 2900 m.*

Solorina is a small genus of five species within the Peltigeraceae. All but one species occur on moist calcareous soil in cold regions. *Solorina spongiosa* (Sm.) Anzi, with the most reduced thallus of the group, is a bipolar arctic-alpine species, reported from Europe, North America, South Island (New Zealand), and James Ross Island (Antarctica), but seldom collected. The map for *Solorina spongiosa* in *Lichens of North America* (Brodo et al. 2001) indicates that this lichen, within U.S. borders, is confined to Alaska, Montana, Colorado and New Mexico. Manierre (1999) notes that it is rare wherever it appears and Geiser et al. (1994) lists it as rare in western North America. Finding crustose lichens in southern Nevada is expected, but the discovery of *Solorina spongiosa* was a surprise to most (Bungartz, pers. comm.; McCune, pers. comm.; Rosentreter, pers. comm.). However, St.Clair (1999) lists it as "Common…in upper montane throughout northern Rocky Mountains south into Colorado Rockies." In this paper it is reported as new to Nevada.

Solorina spongiosa is a rarely collected, brown, grayish, or greenish squamulose, granulose to coralloid, spongiose lichen. The apparent thallus, which is appressed to the soil or moss substrate, forms a dark, warted to coralloid mass, gelatinous when wet. It is composed of cephalodia containing the cyanobacterium, *Nostoc*. The true thallus contains a green alga and is reduced to a thin ring or collar surrounding a large urceolate apothecium (Figure 1). Its paraplectenchymatous upper cortex

Figure 1. *Solorina spongiosa* collected in the Spring Mountains, Nevada. Urceolate apothecia are surrounded by a ring of tissue containing a green alga, and imbedded in squamules containing the cyanobacterium, *Nostoc*. Photo by Bill Hill.

contains *Coccomyxa* in the algal layer. Brodo et al. (2001) consider the green alga to be the primary photobiont for the genus. The underside lacks a cortex. The apothecia and squamules are attached to the substratum by rhizines. The apothecia are sunken in the upper surface of the thallus lobes, the disk is dark brownish red to blackening. Dobson (2000) describes the apothecia as up to 5 mm in diameter. The hymenium is hyaline, and the paraphyses are unbranched with the tips red-brown, coherent, and little thickened. Ascospores are brown, 1-septate (Figure 2), 4/ascus, 30-50 x 18-22 µm, with a warted, furrowed surface. *Solorina spongiosa* occurs over mosses in subalpine and alpine calcareous areas. An exception is at Pictured Rocks National Lakeshore, Alger County, Michigan, where it has been reported, surprisingly, on sandstone (Manierre 1999). Lichens are hosts to many, often specialized host-specific fungal parasites. A lichen parasite is often found on *Solorina spongiosa* (F. Bungartz, pers. comm.). The above description is a compilation from Jahns et al. (1995), Martinez and Burgaz (1999), McCune (2002), McCune and Goward (1995), Nash (2002), Øvstedal and Smith (2001), Thomson (1984) and Thomson and Thomson (1984).

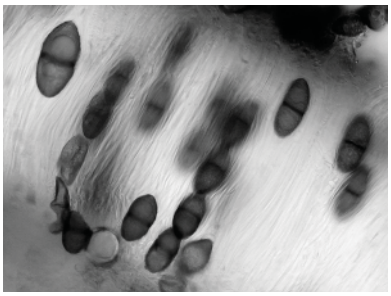

Figure 2. *Solorina spongiosa* spores, 40X, from collections at Three Springs, Spring Mountains, NV. Photo by C. Beyer.

Site Location and Description

The Spring Mountains are located in southern Nevada near the California border. Pahrump Valley and the Amargosa River basin lie to the west and Las Vegas Valley, draining into the Colorado River, lies to the east (Charlet 2001). Las Vegas, with 1.5 million people, is 48 km to the southeast. The range is a sedimentary escarpment 68 km long and up to 26 km wide, with elevations ranging from about 853 m to the highest point on Mt. Charleston at 3633 m. This 'sky island' is among the most isolated ranges in North America, its nearest neighbor being the Panamint Range of California, 161 kilometers away (Mohlenbrock 1992).

Geologically, the range is made up of many sedimentary layers of limestone, dolomite, sandstone, shale, and gypsum deposited by a shallow sea that covered the region 590 to 250 million years ago (mya), during the Paleozoic era. The mountains themselves were formed about 60 mya, close to the end of the Cretaceous Period, when east-west pressure caused the sedimentary layers to buckle and shear. During the Pleistocene – 1.6 million to 12,000 ya – southern Nevada was much cooler and wetter than it is today. As the Pleistocene ended, the plants that had become established in the Spring Mountains became isolated (Mohlenbrock 1992).

Charlet (2001) notes it as the most biologically diverse of all mountain ranges in Nevada, with 37 tree species and 17 endemic plants. On the lower slopes, plants typical of the Great Basin such as sagebrush and creosote merge into the Mojave Desert flora where a variety of cacti and other desert-dwelling plants live. Higher in the range, pinyon pine and Utah juniper take over the drier habitats while ponderosa pine and white fir dominate the more mesic canyons. Bristlecone pine range from as low as 2103 m to tree line at 3048 to 3353 m. At the higher elevations, limber pine joins bristlecone pine. Charlet (2001) notes that there are probably more than 1000 plant species in the Spring Mountains, representing about one-third of the entire Nevada flora. An additional 8 species are endemic to southern Nevada and California and another 3 are endemic to southern Nevada and Utah. A high number of moonwort species of ferns grow in limited habitat available within the Spring Mountains, including some of the same habitats where *Solorina spongiosa* is found. Several endemic vascular species also occur in these mesic, upper elevation sites.

The Spring Mountains are administered by two federal agencies: the Bureau of Land Management (BLM) manages some lower elevation areas, including Red Rock Canyon National Conservation Area; and the Humboldt-Toiyabe National Forest manages the higher elevations of the range. In August 1993, Congress established the Spring Mountains National Recreation Area, administered by the U.S. Forest Service.

Figure 3. Three Springs area, August, 2002, habitat picture of collection site. Endemic Clokey thistle (*Cirsium clokeyi*) in foreground. Photo by C. Beyer.

Extensive vascular plant collections were made in the mid-1900s, primarily by Ira Clokey (1951), but the moss and lichen flora has remained relatively unknown until fairly recently. Elva Lawton collected bryophytes at a few locations in the 1950s, and Lloyd Stark of the University of Nevada Las Vegas has collected bryophytes over the past eight years. Preliminary data show that the moss flora of the Spring Mountains differs from that in the surrounding desert, with species more characteristic of cooler, wetter climates. However, until recently, the lichens were unknown (St. Clair 2004). Larry St. Clair of Brigham Young University (Utah) has, over the last five years, made extensive collections from various locations in the Spring Mountains, primarily to support the air quality biomonitoring program established in cooperation with the U.S. Forest Service (St. Clair, pers. comm.). Beyer has augmented that collection with several species. Currently, ninety-eight species of lichens are known from the Spring Mountains, primarily from U.S. Forest Service lands. Besides *Solorina spongiosa*, other species found that may be considered uncommon include *Dermatocarpon luridum*, *Stenocybe mccunei*, and *Cladonia cariosa*.

In July of 2002, *Solorina spongiosa* was collected in the Spring Mountains, Clark County, Nevada, at Three Springs (Figure 3) in upper Lee Canyon, above the Lee Canyon Ski and Summer Resort (*Beyer 20020710.1 OSC*). Specimens were found growing on a vertical limestone surface over moss between 2957 and 2987 m elevation (UTM 11, 618206E 4016990N), in open canopy. During spring runoff this microhabitat is very wet to saturated. Later in the summer and fall, the moss cover provides a moist environment. Small specimens were also found growing over moss on soil in the vicinity of the limestone boulder. St. Clair (pers. comm.) has seen *Solorina spongiosa* growing on vertical surfaces of small frost heaves in alpine habitats throughout the Rocky Mountain region. A small, 1-2 meter diameter floating mat bog is found a few meters from the Lee Canyon site. We do not know of any other floating bogs in Nevada.

A second site within the Spring Mountains was later discovered approximately 5 km to the east at Mummy Springs (Figure 4), where a small specimen

Figure 4. Mummy Springs site in November, 2003. Photo by C. Beyer.

was found growing over moss on a limestone cliff at 3048 m elevation. Mummy Springs is in the Deer Creek drainage just south of Lee Canyon. Population size is unknown; however, habitat for this species is very limited at this location, as the drainage is essentially dry except at the spring.

Although the Spring Mountains are a desert mountain range, the upper elevations often receive several feet of snow cover in the winter. Snowmelt and occasional rainstorms provide water that

percolates through cracks and fissures in the porous limestone, coming to the surface as springs when it meets an impermeable layer. Both collection sites in the Spring Mountains are in spring areas, between 2957 and 3048 m, that are seepy to saturated during spring runoff, drying out somewhat in the summer months, and covered by a thick layer of snow/ice during the winter. Over 200 springs of various sizes have been documented in the range, and other potential occurrences of *Solorina spongiosa* may exist. However, most of the springs are too low in elevation, or on an aspect that makes the site too hot to support *Solorina spongiosa*.

Both documented sites of *Solorina spongiosa* are on moss over calcareous substrata within the bristlecone pine zone with quaking aspen nearby, in east to northeast-facing canyons below the two highest peaks in the range: Mt Charleston and Mummy Mountain. Brodo et al. (2001) found that the most significant property of a potential rock substrate, in terms of lichen distribution, is its calcium carbonate ($CaCO_3$) content. Calcicoles, those species that prefer alkaline rocks made of $CaCO_3$, such as limestone, often cannot tolerate acidic conditions.

Apothecia

One apothecium from a specimen collected at the Three Springs site had unusual width dimensions between 9 and 10 mm. However, the diameters of most of the apothecia seen fell within the normal range according to the literature, equal to or less than 5 mm.

Distribution

Knowledge concerning the regional distribution of *Solorina spongiosa* has expanded from what was known just a few years ago when *Lichens of North America* (Brodo et al. 2001) was published. Collections within the contiguous U.S. have been located that report *Solorina spongiosa* from Michigan, Montana, Idaho, California, Colorado, Utah, Washington, Wyoming, and New Mexico. In the Pacific Northwest, Oregon is the only state where a collection has not been reported (Figure 5). This is likely related to the lack of calcareous substrata along the Cascade Crest.

Ryan (pers. comm.) indicated that the occurrences in Arizona and California would be reported as

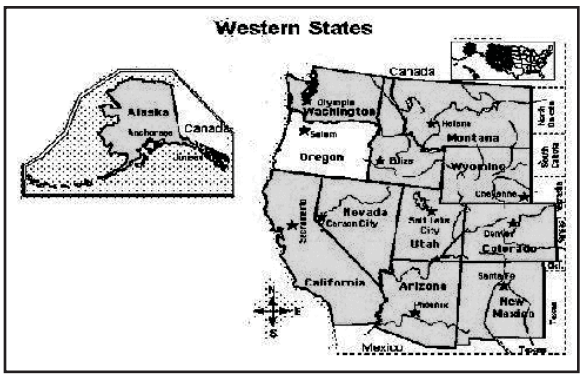

Figure 5. Western states with collections of *Solorina spongiosa are shown in gray*.

new records in the Sonoran Flora v. II and the new California checklist, respectively. The California collection is the occurrence closest to the Spring Mountains site. Air distance between the two sites is 274.4 km <http://www.wcrl.ars.usda.gov/cec/java/lat-long.htm>.

The term "bipolar" indicates occurrence in both the arctic and Antarctic. Smith and Øvstedal (1994) found that 41% of Antarctic lichens are bipolar. The worldwide distribution of *Solorina spongiosa*, a bipolar arctic-alpine species with a strong affinity for calcareous substrates, indicates one of two possible scenarios. Either this lichen occurs as a relict from a time when continents were connected and cold, moist habitats were prevalent, or, following continent drift, it has been effectively dispersed from its origin by means of spores to suitable habitats that are extremely cold for part of the year, and cool and moist for the remainder. Smith and Øvstedal (1994) venture to say that bipolarity probably represents many worldwide distributions that became dissected with climate change and continental movements. I.M. Brodo (pers. comm.) suggests that there is probably a mix of long distance dispersal on the one hand, and mountain hopping on the other, as well as some relict distributions. He states, "We know that many lichen distributions are very ancient, and newly available genetic techniques will undoubtedly be used to sort out these phytogeographic puzzles, with a variety of origins for bipolar distributions emerging."

Threats

Both sites where *Solorina spongiosa* has been found are within 48 kilometers of one and one-half million people in the city of Las Vegas. Both sites are also very accessible to day hikers. The main threat to this species in the Spring Mountains is from local recreationists. For example, the Three Springs site is just above the Lee Canyon Ski and Summer Resort, which is currently seeking a permit to expand operations. This area also receives heavy summer use from hikers, especially those who wish to reach the top of Mt. Charleston by a route that is shorter than the North Loop Trail. The user-created path along the brook emanating from the spring has eliminated plants in its treadline. This sensitive area supports endemic vascular plants, moonworts, and *Solorina spongiosa*.

Mummy Springs, also a site of high biodiversity, including moonworts, receives high recreation use as a popular day-use destination, and also as a rest spot on the way to the upper elevations of Mummy Mountain. In 2003 a bypass trail was constructed to divert use from the spring area. A similar mitigation may be available in the near future for user trails along Three Springs. However, this would not necessarily ameliorate possible impacts from an expansion of the ski area.

Another potential threat is air pollution from an expanding megalopolis, which is predicted to have 2.6 million people by 2020. Over 5,000 people a month come to live in Las Vegas <http://www.reviewjournal.com>. Expanding population, traffic, services, and facilities will yield increasing air pollution. *Solorina spongiosa* sensitivity to air pollution is unknown, but locations where it is found are historically in remote arctic/alpine areas.

Conclusion

In this paper *Solorina spongiosa*, commonly known as the "fringed chocolate chip lichen," is reported as new to Nevada from the Spring Mountains, near Las Vegas, where it grows over and among several species of moss. This remarkable occurrence was unexpected as many were not aware that sites for this lichen had already been discovered in the southwest in New Mexico, Arizona, Utah and California. Additionally, many were not aware of the relatively restricted habitat in the Spring Mountains, where appropriate geology, elevation, moisture and aspect come together to provide a suitable microsite for this species, in the middle of the Mojave desert.

Acknowledgements

The first author has many people to thank, including several members of CALS. I would like to thank especially Bill Hill and Darrell Wright. Additionally, I am grateful to a number of people who answered the list server with specimens to report, and to Bruce McCune for confirming the identification, Lloyd Stark for helping me with a related independent study, Tom Carlberg for comments on a draft of this article, and Trista Crook who sent copies of packet labels from the University of Colorado at Boulder. Last, but not least, I wish to thank Barbara Lachelt for helping me get started with lichens in 1995 during her CALS workshop at San Francisco State University.

Appendix I: Representative collections of *Solorina spongiosa* in western U.S.

Table 1. Western states from which collections of *Solorina spongiosa* have been reported.

STATE	HERBARIUM*	COLLECTOR
Arizona	ASU	Nash
California	CAS	Shevock (#12531)
Colorado	BRY #3462	Shushan
Idaho	Rosentreter	Rosentreter (#9385)
Michigan	herbarium not known	Re: Manierre (1999)
Montana	Rosentreter	Rosentreter (#2071)
New Mexico	BRY #9629	Egan
Utah	CU #407700	Flowers
Washington	herbarium not known	Re: Thomson (1984)
Wyoming	BRY #3417	Wirth

* ASU, Arizona State University; BRY, Brigham Young University; CAS, California Academy of Sciences; CU, University of Colorado.

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Scoliciosporum sarothamni (Vain.) Vezda, New to California.

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Scoliciosporum sarothamni (Vain.) Vezda has been reported from the Pacific Northwest (for example in Seattle, Washington and British Columbia), (see Tonsberg, 1995; Brodo et al, 2001 with a mention of S-shaped spores) and it also occurs in Europe. However, there does not seem to be a published report of its occurrence in California.

A population of *Scoliciosporum sarothamni* (Vain.) Vezda was found on the bark of *Pinus radiata* D.

Figure 1. Soredia and apothecia (arrows) of *Scoliciosporum sarothamni* (Baltzo 13113-O). Photo by Bill Hill.

Don (Montery pine) in the Oakland-Berkeley Hills by Earl Alexander on October 20, 2002, while he was making a survey of lichens on plants on or near serpentine. The sorediate crust resembled a *Lepraria*; however some inconspicuous, minute apothecia were found to be present (Figure 1), and the soredia were localized within circular soralia. The apothecia were pale to yellowish-brown or darker brown and lacked a visible exciple. The yellow-green to green soredia covering the thallus could be mistaken for green algae.

The Alexander collection had S-shaped colorless ascospores measuring 28.8-31.4 x 2.0-3.6 µm which had three to seven (or more) indistinct septa

Figure 2. Spores of *Scoliciosporum sarothamni* showing septae and curvature. Photo by Bill Hill.

(Figure 2). The soredia were KC+ black, but the KC test under the microscope showed that only small groups of cells had turned black. This could indicate scanty or scattered amounts of gyrophoric acid. (Tonsberg, 1992, noted that microscope preparations of the soredia reacted "C+ fugitive faintly red" and stated that "gyrophoric acid was present [trace].") The apothecium had a medium-brown epithecium and a hyaline hypothecium (Figure 3). The thallus was UV-. Comparison with several descriptions and keys from around the world pointed to *S. sarothamni.* See pertinent information below.

This lichen has been reported as toxitolerant, i.e., it is a species which may occur in polluted areas. It is

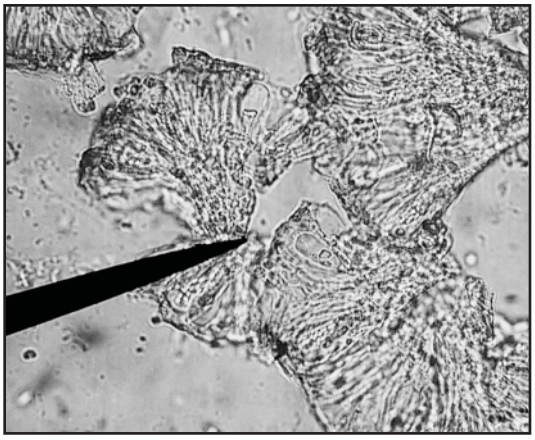

Figure 3. Squash mount of *Scoliciosporum sarothamni* showing brown (darker) epithecium and hyaline hypothecuim. Photo by Bill Hill.

not known whether it occurs only in polluted areas throughout its range. (See Tonsberg's discussion, 1995). Redwood Regional Park is partially surrounded by freeways and a variable amount of air pollution may be present.

Collection data: Corticolous on branch of *Pinus radiata* D. Don, in Redwood Regional Park, Oakland-Berkeley Hills, Alameda County, California. Latitude 37º, 80.5′ N, longitude 122º, 17.8′ W, 345 msm, collected by Earl Alexander on October 20, 2002 (Baltzo 13113-O, UC 1751254).

Pyrrhospora quernea (Dickson) Koerber, another soraliate crustose corticolous lichen looks somewhat similar, but its soredia are a more pronounced yellow color, its apothecia have a distinct lecideine margin, i.e., with no algae, which is easy to see, and its spores are ovoid and unicellular rather than spirally curled and multiseptate. A K+ pinkish-purple reaction occurs in the apothecium of *P. quernea* which is also said to be UV+ orange (Tucker, pers. comm., 2004).

The rock lichen *Scoliciosporum umbrinum* (Ach.) Arnold has been reported in California (Hasse, 1903), as *Biatora umbrina* (Ach.); Hasse, 1913, as *forma psotina* (Fries) T. Fries of *Bacidia umbrina*; Fink, 1935, as *Bacidia umbrina* (Ach.) Branth & Rostr., mostly on rock, rarely on wood, with apothecia light brown to black; Tucker & Jordan, 1979, as *Bacidia umbrina* (Ach.) Bausch. Hasse, (1913) referred to the spores of his material as acicular, bowed and doubly arcuate, whereas the spore shape was not mentioned by Fink (1935). Sirois (1988) reported *S. umbrinum var. compacta* (Koerber) Vezda on serpentine in Quebec.

An attempt here has been made to gather pertinent information about *Scoliciosporum* in the world from the literature:

S. schadeanum (Erichs.) Vezda
Apothecia white to whitish-flesh or whitish-pink or in age turning brownish, 0.1-0.2 (0.3) mm diam., spores 1-2 µm wide (thick) x 24-30 µm. Corticolous. Paraphyses frequently not close, apices sparingly branched, epithecium not granulose (Vezda, 1978).

S. pruinosum (P. James) Vezda
Apothecia white, whitish-flesh or in age turning brownish, 0.1-0.2(0.3) mm diam., spores 1.2 µm wide (thick) x 20-33 µm. Corticolous. Paraphyses close together, apices abundantly branched, epithecium filled with tiny granules (Vezda, 1978). See photo of thickly pruinose white apothecia in Wirth, 1995.

S. sarothamni (Vain.) Vezda
The only other sorediate *Scoliciosporum* is *S. gallurae*, which has spores that are straight to slightly curved, while *S. sarothamni* has distinctly curved spores and discrete soralia (Vezda, 1978). Purvis et al, (1992) mentions morphs on bark with pale apothecia and irregular, pale green soralia (KC+red). Tonsberg (1992), states that the spores are spirally curved. Vezda, (1978) indicates that apothecia are brown to black, the thallus is sorediate, the soredia are yellowish, the spores are 3(-7)-septate, 22-40 x 2 µm, and the thallus is generally corticolous and rarely on rock.

S. umbrinum (Ach.) Arnold (syn. *S. homomelaenum* (Flk.) Massal.)
Thallus not sorediate, spores wider than 2 µm. Apothecia brown to black. Spores spirally twisted, always about 3 µm wide. Apothecia 0.3-0.8 mm diam., spores 3(-7)-septate; on rock and rarely on bark. Apothecia sessile (not stipitate) (Vezda, 1978). See also Purvis et al (1992).

S. ophiosporum (Hellb.) Hav. (syn. *Bacidia kuopioensis* (Vain.) Vain.)
Apothecia brown to black, thallus not sorediate, spores wider than 2 µm, spirally contorted. Apothecia 0.3-0.8 mm diam.; spores 3(-7)-septate; on rock and rarely on bark. Apothecial base tightly constricted and in part stipitate (Vezda, 1978).

S. perpusillum Lahm ex Koerb.
Apothecia brown to black, thallus not sorediate, spores wider than 2 µm, spirally contorted. Apothecia 0.1-0.3 mm diam., spores (3-)5-7septate; on bark (Vezda, 1978). Also reported from the coastal-fir dry subzone of British Columbia (Noble, 1982) with thallus commonly granular, abundant apothecia, hyaline, acicular, curled spores, 20-35(48) x 2.0-2.5 µm.

S. chlorococcum (Stenh.) Vezda
Apothecia brown to black, thallus not sorediate; spores curved like a bow (arcuate) to sub-straight, 4-5 x 20-40 µm, 7-septate commonly. On bark, rarely on rock or wood (Vezda, 1978). See photo (Wirth, 1995).

S. gallurae Vezda & Poelt
Apothecia pale to dark brown, sessile, flat to convex. Continuous mass of soredia and hyphae, discrete soralia sparse or absent. Spores straight to slightly curved, 15-22 x 2.5-3.5 µm, fusiform to slightly curved (Tonsberg, 1992). Has a resemblance to *S. chlorococcum* but Nimis & Poelt (1987) indicate that ascospores are commonly 3-septate, 15-22 x 4-5 µm and rarely simple or 1-septate.

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A Study of Acarosporas in The Lichen Flora of the Santa Cruz Peninsula by A.W.C.T. Herre

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Acarospora is a crustose genus with global distribution. Many species occur on several continents and most wide-spread species of *Acarospora* are extremely variable. Part of this variability appears to be genetic. The other part of the variability is phenotypic plasticity: the variation of characters caused by the interaction of the environment with the genotype. It is not always possible to know the causes of a particular variation.

The two most significant characteristics distinguishing the genus are the large number of spores per ascus (24-200) and the non-amyloid (K/I-) apical cap of the ascus. The hymenium is usually over 80 µm, though the beautiful *A. glaucocarpa* averages a hymenium 60 µm in height. The width of paraphyses, measured near the base, is an important characteristic in delineating species. Spore size is not always diagnostic, though in some species it is decisive, such as *A. thelococcoides* (Knudsen 2003) or *A. oligospora.* The cortex is paraplectenchymatous (though this is rather too general in practice as the hyphal walls can be distinct, anticlinal to intricate, with cells angular to globose). The cortical layer has two or three layers: (1) sometimes an amorphous upper layer of gelatinized hyphae or necral material; (2) a pigmented layer; and (3) a lower non-pigmented layer. This arrangement is sometimes diagnostic, as are the size of the hyphal cells of the cortex. Over-emphasis of this aspect was one factor that led Magnusson to split species too narrowly.

Hyphal bands through the algal layer are important characteristics in some species such as *A. smaragdula* ssp. *lesdainii.*

Another important characteristic of *Acarospora* is the development of the thallus. *Acarospora* thalli generally begin as areoles broadly attached to the substrate but many species eventually develop stipes. A few species have very slender stipes, but many have thick short stipes called a *gomphus*. These raise the thallus slightly off the surface of the substrate. A definite lower surface is formed which may be corticate or ecorticate. The color of the lower surface may vary from white or brown to black. Though not always a valuable character and much abused in some keys, the color of the underside is consistent in some species and diagnostic.

A modern revision of *Acarospora* in both California and North America is badly needed. Our state probably has more than twenty species including at least two endemics. No comprehensive keys for California *Acarospora* exist at this time and taxonomic problems subvert the value of older keys.

In his landmark flora, Herre (1910) listed eight species of *Acarospora* as occurring in the Santa Cruz Peninsula and named two new species: *A. hassei* and *A. arenosa.* I will discuss each of the taxa. The names and authorities used in the headings below are those used in Herre's flora and are sometimes incorrect. They are corrected in discussions.

Acarospora chlorophana (Walhb.) Mass

Recently *Acarospora chlorophana* was transferred

to the genus *Pleopsidium* because its ascus tip stains Lecanora-type with an apical amyloid ring (K/I+blue) and it has a cortex that is prosoplectenchymatous (Hafellner, 1993). Due to the current method of determining *Pleopsidium* by the morphology of their thallus yellow *Acarospora* are often misdetermined as *Pleopsidium* because the ascus stain is not routinely checked. It is important to stain the asci of all specimens. It takes a little practice to get the right stain but using 5% KOH with diluted IKI will make the task easier. The stain is not as clear as the above technical description of ascus structure suggests. One mainly has to see if there is any blue reaction in the tholus.

In California there should be an effigurate species of *Acarospora* named *A. novomexicana* H. Magnusson occurring at both lower and higher elevations. William Weber misdetermined it as *A. chlorophana* in the Rockies and he said his picture of *A. chlorophana* in the Rocky Mountain Lichen Primer (Corbridge and Weber, 1998) is *A. novomexicana* (Weber, pers. comm.). Weber also suspects the picture of *A. flavum* in *Lichens of North America* may be *A. novomexicana* (Weber, pers. comm.).

It should be noted that Herre's concept of *A. chlorophana* includes specimens that are now identified as either *Pleopsidium flavum* (Bellardi) Acharius or *P. chlorophana.* Both *Pleopsidium* and yellow *Acarospora* known so far in California are negative to all spot tests and UV+ a yellowish-orange. One should do all spot tests as there are yellow species which are C+ red or K+ red that have not been found in California yet.

Acarospora bella (Nyl.) Herre

In Herre's time, the bright yellow *A. bella* grew abundantly "on rocks in the foothills and along the seashore." He noted that it sometimes formed "very extensive and conspicuous patches on dry, perpendicular rocks" usually associated with the orange and effigurate *Caloplaca saxicola* (Herre 1910). Now it is often casually and incorrectly called a *Pleopsidium* and it was first pointed out to me as *Pleopsidum* on a lichen walk. You will be exasperated trying to analyze the thallus morphology of *A. bella* using Brodo's key for *Pleopsidiums*!

Herre points out that *A. bella* is "somewhat" variable; this is an understatement. The squamules may be areolate or gomphate, bleached white to greenish-yellow to bright yellow, sometimes with irregular lobes (though not effigurate). The apothecia are black to reddish-brown, sometimes with prominent thalline margins or with umbos. The thickness of hymenium and depths of the cortex are quite variable in even a single population.

A. bella (Nyl.) Jatta is an acceptable name to use until there is a full California or North America revision. The species Herre described occurs in Morocco, Asia, South and North America, and on Hawaii (Clauzade and Roux 1981). Specimens from Santa Cruz into cismontane Southern California and the Channel Islands are all similar though variable. Magnusson's division of *A. bella* in California into *A. socialis*, *A. evoluta*, and *A. subalbida* and other species (Magnusson, 1929b) does not appear to hold up. Neither does Weber's belief that all yellow species on rock are environmental modifications of *A. schleicheri* hold up (Weber, 1967) (see Knudsen, 2004). My research finds that *A. schleicheri* should only be applied to the yellow species on soil at this time and not applied to yellow species on rock. The terricolous species may be a complex containing other species. This practice of naming everything *A. schleicheri* has made it very hard to borrow specimens from herbaria for study.

The current checklist of North America recognizes six yellow species (Esslinger 1997). In Clauzade and Roux's excellent paper (1981) on *Acarospora* fourteen yellow species are recognized. Eva Berrano's current work in progress on yellow species for Volume Three of the Sonoran flora (Hafellner, et al.) should give us a better idea of the diversity of yellow species in Sonoran Mexico and the southwestern United States including Southern California.

Acarospora schleicheri (Ach.) Mass.

This is the yellow *Acarospora* that grows on soil. In Herre's day it was rare in central California. He found it once "on a rocky clay bank near Stanford University." He stated that Bolander collected it in the Mission Dolores area of San Francisco before it was urbanized (1910). He also believed it grew on rock sometimes but he probably confused it with some variations of *A. bella* with equally blackish

apothecia. Ron and Judy Robertson have collected it in Marin County and in other counties north of San Francisco (Robertson, pers. comm.). It was once common in Southern California in the Santa Monica Mountains, the Verdugo Mountains, and in the Lake Elsinore area of Riverside County (Hasse 1913) but I have rarely seen it myself. It consists of a very fragile mound of squamules. It must be carefully collected and handled (I use wax paper) and the soil glued. It grows in full sun. This lichen has suffered from the introduction of weed species and human development. I have only seen it on thin-soiled, weed-free sites that have not been disturbed.

Acarospora fuscata (Schrad.) Arn.

This is the most common *Acarospora* species in temperate North America and one of the most variable. Herre collected both of its most common forms on sandstone: an areolate crust and scattered lobate squamules. It is always black underneath and C+ red KC+ red (KC sometimes has the stronger reaction). It can be dull brown but it is often a beautiful creamy brown hue. There are other C+R species in California but they are quite different like *A. bullata* or *A. obpallens*. Herre collected one specimen on Castle Rock ridge at 3000 feet in 1906 (Magnusson 1929a) where he collected *A. hassei.* (The two species grow together in Santa Monica Mountains on sandstone.)

Acarospora rufescens (Sm.) Th. Fr.

One group of *Acarosporas* is hard to classify. They are mostly dark brown, with immersed apothecia in flat or convex areoles and squamules, usually 0.5 mm or less across, growing on silicate rocks, "forming inconspicuous indeterminate dark blotches" (Herre, 1910). All spot tests are negative. They are rarely noticed and even less often collected. But Herre and Hasse collected them and called them *Acarospora rufescens* or Hasse called some of them *A. squamulosum,* a completely invalid taxon with several species mixed in the type (Magnusson 1929a).

A. rufescens, whose correct authority is (Acharius) Krempth, is actually a species which grows in the south of England, in France, Belgium, and Sweden, but like Herre's *Acarospora rufescens* it forms "smooth, very even, dull or dark brown patches" on silicate substrates (Purvis etc.,1992).

On April 23, 1904, in the foothills near Stanford, Herre collected one of these brown blotches at 150 feet (A.C.T.W. Herre #450, CAS). It is *Acarospora veronensis* Massal and is the most common species you find determined as *A. rufescens* or *A. squamulosum* in California collections by Herre and Hasse.

A. veronensis is a cosmopolitan species. It is variable in form but is distinguished by usually dispersed dark brown areoles or squamules mostly 0.5 or less in diameter with one or more apothecia, paraphyses 1-2 µm in diameter near the base, ellipsoid spores 3-5 x 1-2 µm, lack of fissures between apothecia, negative spot tests, white or brown lower surface, cortex ca. 30 µm thick, and occurrence on acidic rocks. Magnusson described many varieties, attesting to its variability, and it is probable that some of his species he described from single American specimens are varieties too. As currently circumscribed, it is also possible that species not yet known from California could be determined as *A. veronensis,* just as other species been have misdetermined as *A. rufescens* in the 20th century. For example, one collection from Lava Beds National Monument, which Herre determined as *A. rufescens,* is a very nice specimen of *A. badiofusca* which was probably not reported in the United States at the time of his diagnosis (collected by Elmer T. Applegate, Siskiyou County, California, 4000 feet, CAS).

A rimose-areolate crust that is closely related to *A. veronensis* is *Acarospora americana* Magnusson, first collected by Fink in Illinois in 1895. It has been collected at least three times in California. One collection is from Tulare County in Sequoia National Park by Clifford Wetmore (#50513 MIN) where it formed dull brown patches on boulders along the North Fork of the Kaweah River. It has a thicker cortex than *A. veronensis* and does not form a stipe. The other two collections were by Herre in Santa Cruz foothills in 1906 (FH) and Hasse in Santa Monica Mountains (O) both annotated by Magnusson (Magnusson, 1929a).

Acarospora obpallens (Nyl.) Zahlbr.

This is one of our endemic *Acarospora.* Herre

collected it on "soft crumbly sandstone at Laguna Creek, on the coast 9 miles north of Santa Cruz" (Herre 1910). This is probably in the northern limit of its range as are recent collections by Shelly Benson at Pinnacles National Monument (Benson #109, 110, 112, 113 pr. p.,115, 355B, SBBG). Once it was common on soil in Southern California like *A. schleicheri* but even in the Santa Monica Mountains, where it is abundant and the type was collected on soil, it is confined to sandstone outcrops. Only on arid slopes on spike moss-formed terraces in the San Jacinto Mountains can it still be observed on soil. It is C+ red and KC+ red and has a well-developed black lower surface. On soil its form is more reduced, epruinose, and it is actively lichenicolous. The correct authority for *A. obpallens* is (Nylander in Hasse) Zahlbruckner.

Acarospora hassei Herre

This is the first of two new *Acarospora* Herre identified. The type specimens are at the Farlow Herbarium at Harvard and were collected on sandstone at Castle Rock at 3000 feet on June 16, 1906. Apparently Herre never collected any more and no one else has ever collected *A. hassei* again (Tucker, pers. comm.). The North American checklist (Esslinger, 1997) still lists it as a valid taxon. Magnusson (1929a) recognized that it was synonymous with *Acarospora smaragdula* var. *lesdainii* (Harmand in A.L. Smith) H. Magnusson. Clauzade and Roux annotated the type as var. *lesdainii* on May 15, 1979. I recently compared the type with Magnusson exsiccati from Sweden (he had seen the type) and my own collections of ssp. *lesdainii* from the Santa Monica Mountains and they are congruent (Knudsen, 2004). Herre (1910) wrote: "It reminds me of *Acarospora glaucocarpa*, but quite different in appearance from any *Acarospora* I have been able to examine." It is currently rare in California and all collections are on sandstone at 665-1000 meters.

The following modern draft description is given below to help facilitate determination as Herre's description is not exact enough by modern standards. It is slightly edited from a fuller description which includes European specimens. European material seen so far differs with the cortex more distinct and a paler yellowish-brownish without a thin dark line of cells between the amorphous layer and lower cortical layer. Verrucae with a single apothecium are more common in California collections. In well-developed specimens from Santa Monica Mountains the constriction of septation of the upper third of paraphyses is pronounced. An environmentally-reduced form from the San Bernardino Mountains was called *A. particularis* by Magnusson and is lacking an amorphous upper layer (Knudsen 2004).

Acarospora smaragdula ssp. *lesdainii* (Harm. *ex* A.L. Smith) Clauz. et Roux.

Thallus: areoles or squamules with detached edges sometimes upturned or lobate, dispersed or contiguous to rimose-areolate, (0.5-)1.0-2.0 mm across, irregular in shape, round to angular, sub-concave to flat, swelling with development of apothecia, becoming sub- to fully convex and often verruca-like with one apothecium. Upper surface: light or dirty yellow-brown, uneven, undulate, rough, epruinose but often with embedded crystals from substrate. Upper cortex: ca. 30-50 µm, the whole cortex opaque: the upper layer amorphous and ca. 10 µm, lower layer indistinct and yellowish-brown with a narrow upper border of darker cells. Lateral cortex: continuous with upper cortex. Rim: sometimes upturned. Attachment: broad. Lower surface: corticate and dark or pale. Medulla: white of intricate hyphae with irregular cells. Algal layer: ±70 µm, penetrated by hyphal bands, upper and lower surface uneven, algal cells to 15 µm. Apothecia: immersed, 1-4 per areole or squamule, 0.1-0.9 mm across, round to uneven. Disc: reddish to dark and blackish, very rough, concave to level. Thalline margin: not usually prominent. Exciple: ca. 10-30 µm. Hymenium: (110-)120-140 µm, yellowish to hyaline, coherent. Epihymenium: ca. 10-20 µm, yellowish-brown or darker, coherent. Paraphyses: ca. 1-1.5(-2) µm, septation short in upper part (ca. 3-4 µm or less), ±constricted, apices unexpanded. Hypothecium: indistinct ca. 20-30 µm. Ascus: cylindrical swelling to subclavate, ca. 100-110 x 10-30 µm. Ascospores: hundred-plus per ascus, ellipsoid, ca. 3-4(-5) x 1.0-1.5(-2.0) µm. Spot tests: negative. Subspecies *smaragdula* intergrades with ssp. *lesdainii* but its medulla is K+ forming abundant red crystals and in specimens I have seen the apothecia are smooth.

Acarospora arenosa Herre

Herre apparently collected *A. arenosa* once in the hills four miles west of Stanford University at four hundred feet on very hard sandstone on June 11, 1904. Since then no one is reported as having collected it (Tucker, pers. comm.). It is listed as a valid taxon in the North American checklist (Esslinger 1997).

The type has a very thin rimose-areolate crust, a dirty sandy brown. The apothecia develop one per areole, emerging from the areole. They have a true exciple which is black and lacking algae but is not carbonized. The margin becomes reduced and the disk convex. The disc is rough with a very thin distribution of pruina. The apothecia are mostly black (there are a few immature discs that are a dark red), even at 40x power, but become red when wetted.

The annotation on the holotype by Magnusson states "*Biatorellum* pertineti fide Magnusson." He believed it to be a *Biatorella.* Magnusson treated *A. arenosa* in the spurious species section at the end of his monograph on *Acarospora* (1929a).

Biatorella is a genus which once contained *Polysporina* and *Sarcogyne.* All these genera are in the family *Acarosporaceae* and have as many as a hundred spores per ascus. They also have no thalline margin. Their thalli are generally endolithic (but occasionally there is a small amount of medullary tissue with algae beneath the apothecia as in S*arcogyne similis* H. Magnusson). Sometimes *S. regularis* has a very thin areolate thallus. The only species with a regular areolate thallus is *S. bicolor* H. Magnusson, a rare species of Southern California with gyrose apothecia, which is quite different from *A. arenosa* and seems to belong in the genus *Polysporina.*

To my understanding *A. arenosa* is a *Sarcogyne* with apothecial characteristics closest to *S. regularis*. The development of the apothecia from the thallus is similar to the description of *S. bicolor.* The thallus of *A. arenosa* is thin, the hyphae of the medulla interlaced with algae through the substrate. The cortex is poorly developed above the substrate. The apothecia are much smaller than most *Sarcogyne*.

On the duplicate packet at FH Herre wrote that the sandstone where he collected *A. arenosa* is four miles west of Stanford. The site should be within the Jasper Ridge Biological Preserve and more specimens can possibly be collected. Because of its tiny black apothecia and dirty brown crust it looks a little like a small *Lecidea* to the eye. A drop of water in the field will turn the apothecia red.

Sarcogyne in North America are badly in need of revision and many specimens collected do not fall easily into any of the accepted taxa.

Conclusion

Herre's flora of the Santa Cruz Peninsula remains an important historical and scientific document for studying the lichen flora of California, despite changes in the taxonomy of lichenology that makes it obsolete as a field book.

A flora is based on the scientific collections documenting the occurrence of lichens in the study area. As can be seen in my study of the *Acarospora* Herre reported from Santa Cruz Peninsula, a researcher can borrow the specimens Herre collected from herbaria and study those species or genera in the flora one is interested in. In comparison, checklists relying heavily on literature searches are invaluable research tools but often contain many inaccuracies and perpetuate taxonomic errors, misdeterminations, and obsolete synonyms.

As you can see in the discussion of *A. bella* and the other species from the Santa Cruz Mountains the problems associated with this genus are far from settled. This is true of many other lichen genera. Well-documented collections of good specimens properly prepared are invaluable for solving these taxonomic problems. Such CALS members as Charis Bratt, Eric Petersen, Rick Riefner Jr., Judy Robertson, Ron Robertson, Shirley Tucker, and many others have made collections that have enriched our understanding of California's biodiversity, led to the recognition of new species, and to the clarification of many taxonomic problems. It is essential that all CALS members adhere to minimum scientific standards in making collections, including WAS-based GPS readings

and a field notebook. Lichens are slow-growing and it is a shame to see poorly-documented collections that cannot be cited in studies or cannot be donated to public herbaria. This is far more important than the specimens being accurately determined. As seen with *Acarospora* accurate determinations may not even be possible. Lichenology is poorly funded and non-paid lichenologists, who work as software engineers or biological consultants or who are retired or students, can make important contributions to the science. All can at least make the valid collections necessary for an eventual state flora.

Crustose genera are difficult and require microscopic examination and measurements and often careful staining. But they are not impossible and their study has its own special pleasures. All you need is a good microscope, some good literature, and a lot of patience.

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News and Notes

CALS Field Trip to Whiskeytown National Recreation Area October 4-5, 2003

After the hoped-for funding for a major survey of the lichens at Whiskeytown NRA proved not to be forthcoming, a small group of CALS lichen devotees nevertheless went up for the weekend of October 4-5 on a reconnaissance kind of mission. They were: Tom Carlberg, Richard and Janet Doell, Lawrence Glacy, Edie McAbier and Boyd Poulsen.

Those who arrived Friday evening met after dinner at the campground where we were staying with Jennifer Gibson, Ecologist for the NRA. She helped us plan the next day's activities, although she regrettably was not able to join us then.

The seventy square mile Whiskeytown NRA lies at the upper end of the Sacramento Valley. Highway 299 traverses the northern portion of it, following the shoreline of the lake. Whiskeytown NRA consists of rolling to steep forested or brushy hills, the highest point being Shasta Bally at 6189 ft. elevation. It also includes the five square mile Whiskeytown Lake. The lake is part of a large watershed formed by the seven major streams which feed into it and thence into the Sacramento River.

Saturday morning was spent at the mineral springs near the highway close to where Crystal Creek and Willow Creek converge. An alkali grass *(Puccinella howellii)* which is only known globally to grow at Whiskeytown NRA is found at these mineral springs and we were interested in discovering what lichens were there. On the greenstone we found *Candelariella concolor, Lecidea tessellata, Rhizocarpon geographicum, Trapeliopsis wallrothii, Umbilicaria phaea, Xanthoparmelia cumberlandia, and X. mexicana.*

On the abundant Oregon oak *(Quercus garryana)* growing nearby we collected *Evernia prunastri*, (surely the most ubiquitous lichen of all), *Flavopunctelia flaventior, Melanelia glabra, M. subolivacea, Physcia adscendens, P. aipolia, P. tenella, Physconia americana, P. isidiigera, Punctelia subrudecta and Xanthoria polycarpa.*

Towards the middle of the day Tom, who had been to Whiskeytown before, led us down the Crystal Creek Road until we found a suitable spot for lunch. The group split up for parts of the afternoon. Richard and Janet were taking photos and collecting voucher specimens for an upcoming mini-guide and were somewhat encumbered by equipment. The others wandered a little further afield. We all continued on down the western part of the NRA, however, and found *Alectoria sarmentosa* ssp. *sarmentosa* on *Pinus ponderosa, Esslingeriana idahoensis, Leptogium lichenoides* and *Physconia perisidiosa* on canyon live oak *(Quercus chrysolepis)*, and *Lecanora fuscescens* on an old stump. We found *Usnea filipendula* and another as yet unidentified Usnea with interesting white stripes on the branches at Coggins Park, and shortly thereafter called it a day. The Doells served a simple supper for the group back at the campground.

Sunday's outing was relatively short. We looked around in the southeastern section of the NRA, examining lichens in the parking lot of the Environmental School and the N.E.E.D. camp there. *Kaernefeltia merrillii* showed up there on the canyon live oak; and *Collema furfuraceum*, *Parmelina quercina* and *Physcia adscendens* on black oak *(Quercus kelloggii)*. In other areas in that general part of the park Tom collected *Collema furfuraceum*, *C. nigrescens, Physcia aipolia, Physconia enteroxantha and P. perisidiosa* on canyon live oak, and *Parmelina quercina* on black oak.

One group looked around below the dam and

found the tiny pale green *Normandina pulchella* and the also very small *Waynea californica* which Tom knew were there from a previous excursion.

We broke up and most of us headed home around noon on Sunday. As a preliminary survey of the lichens at Whiskeytown NRA the weekend was a success. It would take a larger group and considerably more time to do a definitive report on the lichens of Whiskeytown, given the variety of elevations, substrates, plant communities and microclimates found there.

Many thanks are due Jennifer Gibson for making camping and parking arrangements and being supportive throughout.

A formal list of the lichen species collected will become available later this summer.

Reported by Janet Doell

The 34th annual Fungus Fair
December 6-7, 2003

The 34th annual Fungus Fair was held at the Oakland Museum on December 6th and 7th, 2003. Visitors saw an incredible display of mushrooms of different sizes, shapes, colors, and textures. The mushroom displays, artfully arranged, transported one to a forest floor of pine needles, leaves, mosses and lichens, twigs and branches.

If you have not seen previous Fungus Fair exhibits, make a point to see the next one, December, 2004. In addition to the displays, one can attend lectures, slide shows, cooking classes, and buy books, T-shirts, and fresh mushrooms.

The California Lichen Society had three display tables. One table had a few microscopes set up to show fruiting bodies, a live green alga on a rock sample collected and stored for five years in a drawer (the alga was still alive), and a cross section of an Usnea sp. cord. A second table displayed lichen books. The third table displayed a phylogeny of life poster complete with a geological time line, a flow chart with numerous live samples showing the latest classification system arrangement of three domains: Archaea, Bacteria, and Eukarya.

Single celled organisms with complex cell walls, photo- or chemosynthetic nutrition, and special biochemicals are grouped into the Bacteria domain. Relatively simple, single celled organisms living in extreme environments, e.g., high pressure, high salinity, high acidity, etc. and having a primarily absorptive mode of nutrition are grouped into the Archaea domain. Organisms with a cytoskeleton, ie., structural complexity with internal membranes, mitochondria, and with nuclei having discrete multiple linear chromosomes and a nuclear membrane are grouped into the Eukarya domain.

The main focus of the poster was of one of the crown eukaryotes (where all multicellular organisms are), the fungi. Modern day fungi, dating from around 600 million years ago (MYA) derive from land fungi (900 – 570 MYA) which in turn derive from an ancestral fungal form about 1BYA. It is currently thought that this ancestral fungal form had an Archaean ancestor.

Cyanobacteria fossils have been found in rocks dated as long ago as 3.5 BY. Some cyanobacteria combined with land fungi to form lichens. The fungi/algae symbiosis arose several times. These lichenized fungi lost their ability to absorb their own food and do not grow free.

Descendants of some bacteria became engulfed by some protists (endosymbiosis) and formed green algae in salt water (1 BYA). Free-living chlorophyll-containing bacteria resembling chloroplasts are thought to have been engulfed by protists, forming single-celled green algae. That's why they are green, not blue-green. This is why green algae, along with their chloroplasts, are thought to be the ancestors of land plants. Cyanobacteria use entirely different photosynthetic compounds (bacteriorhodopsins). Five hundred million years later green algae lived in fresh water. Some of the fresh water green algae combined with land fungi to form lichens too.

This evolutionary line of freshwater green algae also produced the first land plants (505-440 MYA), the nonvascular (liverworts, hornworts, mosses), and seedless vascular plants (lycopods, Selaginella, horsetails, ferns).

The liverworts or hornworts represent the first non-vascular non-seed plants. A number of evolutionary lines followed the freshwater green algae ancestry: mosses, still non-vascular land plants, then tracheophytes, i.e., vascular plants, first seedless: Lycopodium, Selaginella, then Sphenopsida, e.g., horsetails (Equisetum), ferns, conifers with naked seeds (425MYA), and then flowering plants with protected seeds (150MYA).

The first land plants still needed to be close to water to allow for the reproductive cells to combine. As the male and female reproducing structures became more protected, plants were able to live away from a wet environment.

Relatedness for organisms is shown by DNA or RNA analysis which checks for highly-conserved gene segments (i.e., having few mutations) coding for complex different components for protein sequences (translation and transcription). Morphology at some stage of development, which is used for taxonomic classification seems for the most part to correlate well with the new groupings or clades. Lichens, however, since they are not composed of one organism but are symbiotic/parasitic associations cannot be analyzed by these same methods alone. When fungi and algae and cyanobacteria associations form lichens, emergent properties arise requiring other additional analyses.

Reported by Irene Winston

CALS field trip to Howarth Park, Sonoma Co. January 10, 2004

Howarth Park is a lovely 150 acre park in Sonoma County on the East Side of Santa Rosa. Annadel State Park adjoins the Park and can actually be entered on foot or bike, from Howarth Park.

Picnickers, walkers, hikers and bikers can begin at either Lake Ralphine on the west or Spring Lake on the east and take the approximate 3 mile loop through the park. Old oak woodlands mix with California bay, madrone, manzanita and buckeye trees. Douglas-fir dots the park. The two large lakes are used for boating or fishing, there is a swimming pond which is open in the summer, and another small pond that has become marsh. On any day, you can find people walking, running or biking the trail that is lined with benches dedicated to loved ones.

The lichens to be found are the typical species occurring in Sonoma County oak woodlands and chaparral. *Ramalina menziesii* Taylor festoons the oaks and the twigs are covered with *Parmotrema chinense* (Osbeck) Hale & Ahti, *Ramalina farinacea* (L.) Ach., *R. leptocarpha* Tuck., *Evernia prunastri* (L.) Ach., *Usnea arizonica* Mot., *Physcia adscendens* (Fr.) H. Olivier, and Xanthoria species. *Punctelia subrudecta* (Nyl.) Krog, *Parmelia sulcata* Taylor, *Hypotrachyna revoluta* (Flörke) Hale can be found. Probably the most common foliose lichens at Howarth park are *Flavoparmelia caperata* (L.) Hale and *Flavopunctelia flaventior* (Stirton) Hale. These species cover most oak trunks. Also quite common in Sonoma County are both *Teloschistes chrysophthalma* (L.) Th. Fr. and *T. exilis* (Michaux) Vainio, and Howarth Park is no exception to this phenomenon.

On the January day, we had overcast skies, but no rain. The field trip was actually sponsored by the Milo Baker chapter of the California Native Plant Society. Twenty-Two people attended and Judy Robertson was originally scheduled to lead the trip, but a very bad case of laryngitis brought CALS President, Bill Hill to the forefront. Bill did an excellent job, taking over for the day.

We met at the Lake Ralphine parking lot. Close to the parking lot is the official Howarth Park Nature Trail. This is a short trail through oaks and manzanita shrubs. Our first destination was the picnic tables above the nature trail, where various organizations hold summer and vacation camps for the local kids. As we walked the Nature Trail, we picked up fallen branches to take to the picnic tables. There we spent the first hour using a simple key to local Sonoma County lichens that Judy had made to familiarize ourselves with lichen growth forms and morphology, reproductive structures, colors and common genera in the county. After this mini-workshop, we were ready to retrace our steps and see the specimens in their more natural setting. We inspected the rocks and trees along the paths. It is amazing that lichen field trips can travel over such a short distance and still take all day. This was the case for this day at Howarth Park, but after

we closed at 2 pm, all the participants had a good foundation for recognizing the lichens to be found throughout the park.

Reported by Judy Robertson

CALS field trip to McClellan Ranch Park, Santa Clara Co., Saturday January 17, 2004

This 23.5 acre park is owned and maintained as a nature preserve by the City of Cupertino. Stevens Creek flows through the park, shaded by western sycamores, black cottonwoods, willows and other riparian trees. Steelhead, roach, stickleback and crayfish are at home in these waters, and numerous species of birds can be seen or heard from the nature trail that parallels the creek's path as it curves around the old pasture. Many of the original farm buildings have been restored and are open to the public. In addition, the City of Cupertino has set aside space for an award-winning 4H program. You can see hogs, goats and lambs in season. The Santa Clara Audubon Society offices are housed in the original farmhouse and Cupertino Community gardens occupy two acres of the park.

This fertile land was supporting a thriving population of Native Americans when Juan Bautista De Anza camped nearby in 1776. His expedition named the creek Arroyo San Joseph Cupertino. Today it is known as Stevens Creek, after Captain Elisha Stephens who settled there is 1859. By 1964 this area had become "too durn civilized" for the Stephens family and they sold the land to W. T. McClellan and George McCauley who raised dairy cattle there. It was operating as a horse ranch at the time the City of Cupertino purchased it. It was designated a Nature and Rural Preserve in 1975. Each year thousands of children and adults participate in naturalist-led activities in McClellan Ranch Park.

Barbara Banfield, naturalist at the McClellan Ranch Park, organized this lichen field trip. It was well attended; over 40 people Barbara had invited from various local organizations came for a sunny Saturday morning foray through the Park.

We started with a slide presentation by Judy Robertson. She talked about the variety and diversity we find in lichens and then explained the 3 morphological divisions, identification techniques including color differentiation, morphological and reproductive characteristics. The room was very crowded, but everyone had a good idea of what to look for when we headed outside.

There were very few rocks for observing crustose lichens except for some boulders transplanted to make a stone wall directly outside of the center. There we found small specimens of *Xanthoparmelia* sp., *Lecanora muralis* (Schreber) Rabenh., *Rhizocarpon geographicum* (L.) DC., *Caloplaca* sp., *Lecidea atrobrunnea* (Ramond ex Lam DC.) Schaerer, *Verrucaria* sp., *Aspicilia* sp., and *Candelariella* sp.

The Nature Trail parallels Stevens Creek and after leaving the rock wall, we moved to the old wooden fence along the trail. Exploring for lichens on old fences is always a favorite pastime for lichenologists. We found the common species: *Candelaria concolor* (Dickson) Stein, *Xanthoria* sp., *Flavopunctelia flaventior* (Stirton) Hale, *Ramalina leptocarpha* Tuck. and *R. farinacea* (L.) Ach., with *Punctelia subrudecta* (Nyl.) Krog.

The many sycamore trees lining much of Stevens creek were very sparse in lichens growth. A few other species of trees were interspersed with the sycamores and on a black walnut we found *Physconia* sp., *Xanthoria* sp., *Hyperphyscia adglutinata* (Flörke) H. Mayrh. & Poelt, and *Physcia adscendens* (Fr.) H. Olivier. Some old orchard trees were home to the fruticose lichens *Ramalina leptocarpha* Tuck. and *Teloschistes chrysophthalmus* (L.) Th. Fr. On a box elder tree we found *Phaeophyscia orbicularis* (Necker) Moberg, *Phaeophyscia cernohorskyi* (Nadv.) Essl. and *Candelaria concolor* (Dickson) Stein. The smooth bark of young buckeye trees had many colonies of *Lecanora pacifica* Tuck., *Tephromela atra* (Hudson) Hafellner, and *Caloplaca* sp.

We even searched the cement surfaces for lichens and with our KOH that Bill Hill always brings along we differentiated the Caloplaca from Candelaria species.

Further along, the trail veers away from the creek and enters an old walnut grove. Some of the orchard trees were golden with Xanthoria species covering the twigs. We also found *Trapeliopsis granulosa* (Hoffm.) Lumbsch on some dead stumps. We gathered around a fallen walnut tree and examined the branches for lichens. The alga *Trentepohlia*, a variety of crusts and the common lichens we had seen earlier were growing on the tree branches .

Planning to finish by noon, we completed our day by walking through the community gardens. Old wooden fences in the garden were rich with the species we had seen throughout the day with Xanthoria predominating.

Barbara did a great job advertising the field trip to so many groups in the area. We had children to older folks in attendance. She has organized a wide variety of naturalist activities in this small county park. Bill Hill and other CALS members were a great help on the trip; because of the large size, one leader is just not enough. We were thankful for this team effort to introduce lichens to such a large and interested audience.

Reported by Judy Robertson

CALS field trip to Mount Diablo State Park, January 31, 2004

Twenty lichen enthusiasts met at the picnic area of Rock City, Mt Diablo State Park on Saturday, January 31, 2004. Doris E. Baltzo, one of the founding members of CALS, led the field trip. Doris received her Masters Degree from San Francisco State University with her thesis *A Study of the Lichens of Mount Diablo State Park*, Contra Costa California in 1970. In 1989, her findings appeared in MYCOTAXON Vol. XXXIV, No. 1, pp. 37-46 with updated nomenclature and comments. She reported 140 species at that time.

Mount Diablo rises to 3849 ft in Contra Costa County about 40 miles ENE of San Francisco. Because of its height and location along the western edge of California's large inland valley, United States surveyors selected Mount Diablo as a base meridian (37°53') used today in legal descriptions and maps. According to Pampeyan (1963), most of Mount Diablo is underlain by a plug of broken and jumbled Upper Jurassic sedimentary, igneous, and metamorphic rock of the Franciscan formation, which was thrust upward through surrounding rocks and lubricated by serpentine veins present on the north side. Exposures of greenstone, chert, greywacke, shale, limestone, schist, and conglomerate comprise most of the northern end of the mountain, including the summit. Three ridges on the north side of the mountain are North Peak to the northeast (3563 ft.), of greenstone, pillow basalt and fine-grained basalt; Eagle Peak to the northwest (2369 ft.), of diabase, and Deer Ridge, just south of Eagle peak, a grassy area supporting lichens on soil. The southwest side of the mountain consists mainly of fossiliferous clastic marine beds ranging from late Jurassic to late Miocene. Sandstone is abundant consisting of 33-50% feldspar, of granitic origin.

Rock City is an area of large, picturesque, sandstone outcrops. We started out exploring the oak woodland surrounding the parking/picnic area. Sandstone outcrops intersperse with the old oaks. Almost half of the group were California Native Plant Society members and relatively new to lichens, so this was a field trip of introducing lichen morphology and names. The oak trees were a good place to start with many typical species: *Flavopunctelia flaventior* (Stirton) Hale, *Flavoparmelia caperata* (L.) Hale, *Evernia prunastri* (L.) Ach., *Melanelia* spp., *Ochrolechia subpallescens* Vers., *Parmelia sulcata* Taylor, *Parmelina quercina* (Willd.) Hale, *Parmotrema* spp., *Physconia americana* Essl., *Physconia isidiigera* (Zahlbr.) Essl., *Punctelia subrudecta* (Nyl.) Krog, *Ramalina farinacea* (L.) Ach., and *Xanthoria polycarpa* (Hoffm.) Rieber. We did KOH spot tests to differentiate *Xanthoria* from *Candelaria* species and *Physcia* from *Physconia* species. On nearby rocks we found *Xanthoparmelia cumberlandia* (Gyelnik) Hale and *X. mexicana* (Gyelnik) Hale. *Cladonia* species were on the soil surrounding the rocks.

Above the picnic area were larger sandstone outcrops and we spent the time after lunch with our noses to the sandstone. *Aspicilia* spp., *Rhizocarpon bolanderi* (Tuck.) Herre, *Lecidea atrobrunnea* (Raymond in Lam. & DC.) Schaerer, *Pleopsidium chorophanum* (Wahlenb.) Zopf., *Neofuscelia* sp. *Lecanora muralis* (Schreber) Rabenh., *L. mellea*

W. Weber, *Caloplaca* sp., *Acarospora fuscata* (Nyl.) Arnold were some of the lichens on the rocks. On the trail back to the parking area we found *Caloplaca chrysophthalma* Degel on the lower part of many of the oak trunks.

About 3 pm, some of the group headed to Pt. Richmond for the CALS board meeting while the remainder traveled to the Peak to look at the lichens on greenstone. Please refer to the MYCOTAXON article for a list of the lichens Doris found on her research of Mt. Diablo. In addition, the following species are recorded as new from the State Park by Judith and Ronald Robertson.

Voucher specimens will be placed in the UC Berkeley herbarium.

Buellia badia (Fr.) A. Massal: On moss - Trail to North Peak - JRR 8364
Caloplaca variabilis (Pers.) Müll. Arg.: On sandstone - W. Fork Sycamore Creek - JRR 8377
Candelariella terrigena Räsänen: On *Fuscopannaria* sp. - Mt. Diablo Peak - JRR 8359
Catapyrenium psoromoides (Borrer) R. Sant.: On oak - Rock City - JRR 8327
Cladonia furcata (Hudson) Schrader: On soil - W. Fork Sycamore Creek - JRR 8427
Collema tenax (Sw.) Ach.: On soil - Trail to North Peak - JRR 8360
Cyphelium tigillare (Ach.) Ach.: On dead manzanita - Rock City - JRR 8312
Dimelaena radiata (Tuck.) Hale & Culb.: On chert - Trail to North Peak - JRR 8485
Dimelaena thysanota (Tuck.) Hale & Culb.: On greenstone - Devil's Elbow - JRR 8487
Dermatocarpon intestiniforme (Körber) Hasse: N. side of Mt. Diablo Summit - JRR 8350
Dermatocarpon luridum (With.) J.R. Laundon: On chert - Trail to North Peak - JRR 8416
Endocarpon pusillum Hedwig: On soil - Sandstone outcrops, Mt. Diablo Rd. - JRR 8304f
Hypogymnia physodes (L.) Nyl.: On dead manzanita - W. Fork Sycamore Creek - JRR 8386
Lecania brunonis (Tuck.) Herre: On sandstone - Mt. Diablo Rd. - JRR 8458
Lecanora demissa (Flotow) Zahlbr.: On sandstone - N. side of Mt. Diablo Summit - JRR8504
Lecanora gangaleoides Nyl.: On sandstone - Rock City - JRR 8316
Lecidella asema (Nyl.) Knoph & Hertel: On sandstone - Diablo Rd. - JRR 8306
Lecidella elaeochroma (Ach.): On *Pinus sabiniana* - Mt. Diablo Peak - JRR 8355
Letharia vulpina (L.) Hue: On dead juniper - Devil's Elbow - JRR 8491
Lichinella nigritella (Lettau) More: On chert - Trail to North Peak - JRR 8409
Lobothallia alphoplaca (Wahlenb.) Hafellner: On greenstone - N. side of Mt. Diablo Summit - JRR 8513
Melanelia panniformis (Nyl.) Essl.: On greenstone - N. side of Mt. Diablo Summit - JRR8511
Ophioparma rubricosa (Müll. Arg.) S. Ekman - On dead juniper - Devil's Elbow - JRR 8488
Parmeliella cyanolepra (Tuck.) Herre: On soil - Sandstone outcrops - Mt. Diablo Rd - JRR 8460
Placidium lacinulatum (Ach.) Bruess: On soil - N. side of Mt. Diablo Summit - JRR 8456
Placynthium nigrum (Hudson) Gray: On chert - N. side of Mt. Diablo Summit - JRR 8502
Peltigera canina (L.) Willd.: On moss - N. side of Mt. Diablo Summit - JRR 8358
Peltigera membranacea (Ach.) Nyl.: On moss - W. Fork of Sycamore Creek - JRR 8383
Peltula obscurans var. *hassei* (Zahlbr.) Wetmore: On soil - Sandstone outcrops - Mt. Diablo Rd. - JRR 8459
Polychidium muscicola (Sw.) Gray: In moss - Devil's Elbow - JRR 8494
Psora decipiens (Hedwig) Hoffm.: Sandstone outcrops - Mt. Diablo Rd - JRR 8462
Staurothele areolata (Ach.) Lettau: On chert - Trail to North Peak - JRR 8417
Stereocaulon intermedium (Savicz) H. Magn.: On chert - N. side of Mt. Diablo Summit - JRR 8440
Tephromela atra (Hudson) Hafellner: On manzanita - Rock City - JRR 8313
Toninia ruginosa (Tuck) Herre: On chert - Mt. Diablo Peak - RR 8346
Toninia sedifolia (Scop.) Timdal: On moss/soil - Trail to North Peak - JRR 8400
Trapelia coarctata (Sm.) Choisy: On sandstone - Rock City - JRR 8495
Trapeliopsis californica McCune & Camacho: On moss - Rock City - JRR 8322
Trapeliopsis steppica McCune & Comacho: On sandstone - Rock City - JRR 8329
Trapeliopsis flexuosa (Fr.) Coppins: On old stump - Rock City - JRR 8331
Trapeliopsis granulosa (Hoffm.) Lumbsch: On Adenostoma - Rock City - JRR 8339

Tremolecia atrata (Ach.) Hertel: On chert - N. side of Mt. Diablo Summit - JRR 8445
Waynea stoechadiana (Abassi Mauf & Roux) Roux & Clerc: On oak - Trail to North Peak - JRR 8403.

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Reported by Judy Robertson

CALS Potluck/Birthday Celebration/ General Meeting January 31, 2004

The CALS Birthday Celebration, Pot Luck and General meeting was another success this year. After an inspiring day at Mt. Diablo, with long time member Doris Baltzo leading the trip, 12 persons returned to the Brickyard Landing Clubhouse for the evening. Bill brought his usual layout of tasty appetizers from Trader Joe's, and the Board snacked while holding their Board meeting. Those on the Board had returned early from the field trip for the meeting. The remainder of the group had driven to the summit to look for more lichens. After they arrived at the Clubhouse we continued the evening with a pot luck. There were many tasty treats including a red beet and cranberry salad, tabouli salad, bean salad, tomato and parsley salad, chicken enchiladas, fried chicken, a variety of vegetarian dishes, corn bread, garlic bread and wine and juice. Janet had made the CALS Birthday cake, decorated with real lichens. After singing "Happy Birthday" we held our Annual General meeting. The highlight was the introduction of the new Officers for 2004-2006. The minutes follow on p. 29.

After the General Meeting Janet Doell gave a brief slide show about the preparation of the new M*ini Guide to Some Southern California Lichens* which she and her husband Richard had recently completed. They had traveled to 25 sites over a period of two years, photographing (Richard) and collecting voucher specimens (Janet). They visited several National and State Parks, Forests, and Recreation Areas in all but 2 of the Southern counties in an attempt to record lichens which the general public would be apt to see on a weekend outing. This new mini guide is a beginner's field guide, similar to the first *CALS Mini Guide to Some Common California Lichens* compiled by the Doells. Finally, Janet showed a number of good lichen slides which for one reason or another could not be included in the book.

Attending the evening events were: Janet and Richard Doell, Bill Hill, Boyd Poulsen, Tom Carlberg, Sara Blauman, Stephen Buckhout, Barbara Lachelt, Judy Robertson, Irene Winston, Doris Baltzo, Jim Waters, Kathy Faircloth and her son Steve, and Lee and Rick Ellis.

Reported by Judy Robertson

Field Trip to Pierce Pt. Ranch, Pt. Reyes National Seashore
March 13, 2004

On a sunny March 13, 2004 a large contingent of CALS members showed up for a field trip to Pierce Pt. Ranch at the Pt. Reyes National Seashore. The ranch is one of the older historic ranches which dot Pt. Reyes Seashore, and this one is no longer inhabited. Tall wooden fences were constructed around the center of the property as windbreaks in this windy spot. They are covered with what has to be one of the most remarkable collections of lichens in their natural habitat in the Bay Area.

This was a "looking only" kind of field trip. No collecting. In an effort to make it more interesting and informative, Janet Doell brought her collections from a previous photography trip there, gave everyone a list of these lichens, with brief descriptions of some, and challenged the participants to find as many of these species as possible on the fences. This kept everyone busy for a couple hours.

Among other things, we learned that *Cetraria chlorophylla* differs from the similar C. *platyphylla* in that the first has white or gray soredia along the edge of the lobes, while the second has the dark brown pycnidia more typical for this genus. Also, we could compare *Buellia oidalea* and *Pyrrhospora quernea,* two crustose lichens with black apothecia. We looked for *Chrysothrix candelaris* and found that bright yellow lichen on a stretch of fence where the sun did not shine. We compared three *Hypogymnia* spp.: large flattish *H. enteromorpha, H. heterophylla* with lobes of various widths, and *H. occidentalis,* a small lichen with narrow lobes, growing close to the substrate.

The bluish-gray *Parmelia sulcata,* with white markings on the thallus, was well represented on these fences. *Usnea lapponica* stood out with its many small soredia along the short branches. The red color of *U. rubicunda* was hard to overlook. Pretty orange *Xanthorias* were clinging to the fence as well.

All these and more kept us all busy until midday when we broke for lunch and gathered around the wooden tables near the fence. In the afternoon we proceeded to Mt. Vision and drove to the summit. This was a more natural environment for lichens, in this case chaparral. Brown *Nephroma laevigatum*, the lichen with a yellow medulla and apothecia on the lower surface, was found here, along with *Collema furfuraceum,* a lichen with a cyanobacterium for a photobiont instead of an alga. Our last stop on Mt. Vision was a Bishop pine forest where we found a *Bryoria,* rare in the Bay Area. This one was *B. fuscescens,* hairy, short and greenish. *Hypogymnia physodes* was clinging to the pine bark here as well. Finally, we also found some *Cladonia macilenta*, the one with red topknots, to complete our day.

But there was one more order of business for some. It was time for a meeting of the CALS Board of Directors, most of whom were on the field trip. So this illustrious group chose a scenic spot at the entrance to a gated side road to hold their meeting. Proceedings were briefly interrupted as a truck drove up, the driver unlocked the gate, and they drove away right through the middle of the meeting.

Those of us that were still left returned home from there.

Present on this field trip were :

Tony Alexander, Shelly Benson, Sara Blauman, Don Brittingham, Tom Carlberg, Sidney Crocker, Janet and Richard Doell, Kathy Faircloth, Janet Gawthrop, Daniel George, Bill Hill, Lori Hubbart, Greg Jirak, Steve Korman, Barbara Lachelt, Russell Lachelt, Michele Lee, Judy and Ron Robertson, and David Strain.

Reported by Janet Doell

CALS Field Trip to Sherwood Road, Mendocino County April 17, 2004

The trip began with nine lichen enthusiasts meeting at the Skunk Train Railroad Depot in Willits in Mendocino County. CALS member Don Brittingham of Ukiah planned our trip and led us to six sites; each one differing from the previous with a fascinating new array of lichens to study and collect. We caravanned along Sherwood Road, starting from the exit off 101 in the town of Willets proceeding north through rolling hills with beautiful mountain scenery to finally join again with 101 north of Willets. The area is a transition zone between the redwood and Douglas-fir forest with lots of meadows, streams, vernal pools, and rock outcrops. We made six stops along our route. The directions to each site are provided below for future reference.

To reach Stop 1 (N39°25.865′ W123°22.904′ elev. 1522′) we proceeded 2 miles from the intersection of Sherwood Road and Hwy 101 in Willets to the Brooktrails entrance. Turning left and then driving another .4 miles we arrived at a small cool moist meadow in a redwood grove, ripe for exploring. The moist soil offered liverworts, hornwort, and a variety of mosses as well as calypso orchid. Rotting redwood stumps provided habitat for at least four species of *Cladonia*. Amongst the *Lepraria*, one could find *Cladonia macilenta* Hoffm. growing in the vertical grooves of the bark on the lower trunks of the redwoods. Fallen branches from nearby oak twigs were populated with *Hypogymnia* sp., *Tuckermannopsis orbata* (Nyl.) M. J. Lai, and *Evernia prunastri* (L.) Ach. We found our first *Platismatia herrei* (Imshaug) Culb. & C. Culb that we would find in abundance at most of our subsequent stops.

Retracing our route to the Booktrails entrance, we turned left onto Sherwood Road and continued another 4.2 miles to Stop 2 (N39°28.978′ W123°24.725′ elev. 2187′). This roadside stop was an area above a ravine leading down to a flowing creek. Mixed conifers, oaks and lots of poison oak dominated the scene. Usneas were dripping from the trees and the huge poison oak plants. Growing beside the usneas were *Bryoria* sp. and *Alectoria* sp. *Peltigera collina* (Ach.) Schrader, *Pseudocyphellaria anthraspis* (Ach.) H. Magn., *Platismatia herrei* (Imshaug) Culb. & C. Culb, and *Lobaria pulmonaria* (L.) Hoffm. were found in abundance. On Douglas-fir we found *Sphaerophorus globosus* (Hudson) Vainio. More cladonias were also in this moist place.

On to a wonderful huge rock outcrop in an open meadow complete with a marsh full of ducks as a backdrop. We reached Stop 3 (N39°29.651′ W123°25.696′ elev. 2249′) by continuing another 1.3 miles on Sherwood Road. There is a single large oak adjacent to the rock offering even more diversity of lichen habitat. None of us being particularly well versed in geology, we decided to call the rock simply conglomerate; lichens were easily removed and collected. *Xanthoparmelia, Caloplaca, Umbilicaria*, and *Candelariella* provided a splash of color as we approached the rock. On closer scrutiny, it seemed like every square inch of the rock provided some sort of lichen to study. Cyanolichens were well represented at this site by *Collema, Leptogium, Leptochidium, Nephroma, Pseudocyphellaria,* and *Sticta*, some being found on the rock and others on the tree. We ate our lunch at the base of the rock, warming in the sun on this rather crisp day.

At approximately 2.2 miles from Stop 3 we turned left at the Fort Bragg/Hwy 101 intersection. Stop 4 (N39°31.685′ W123°27.222′ elev. 2211′) was a barbed wire fence along the dirt road. We walked along the fence admiring the old wooden posts that were "aflame" with *Letharia vulpina* (L.) Hue. In addition to the *Platismatia* and *Hypogymnia* species that were very abundant on the posts was *Ochrolechia* sp., *Thelomma occidentale* (Herre) Tibell, *Trapeliopsis flexuosa* (Fr.) Coppins & P. James, *T. granulosa* (Hoffm.) Lumbsch, *Chrysothrix candelaris* (L.) J. R. Laundon, and *Candelaria concolor* (Dickson) Stein making a very colorful display.

Continuing another 3.5 miles we came to another fence, this time an old split rail fence which was Stop 5 (N39°32.630′ W123°30.377′ elev. 2470′). It was interesting to compare the lichen community of this fence with that of the previous stop. Here, running like green veins in the grooves of the lateral rails were several species of *Cladonia*. There were also large rosettes of *Parmelia saxatilis* (L.) Ach. and *P. hygrophila* Goward & Ahti as well as most of

the same lichens as we saw on Stop 4.

Don saved the best for the last – a grand finale to our trip. We returned to the Fort Bragg/Hwy 101 intersection and continued north 6.4 miles along Sherwood Road which at this point is a one lane dirt road. The scenery was beautiful as the road wound through the hills. Finally, we came to Stop 6 (N 39°35.432' W123°27.481' elev. 1683'). There, hanging over the road in a low spot were the long green strands of *Usnea longissima* Ach. A second story Oregon white oak was literally "festooned"with the lichen. A few small thalli were detected on a couple adjacent trees. Some tall Douglas-firs on a higher slope nearby had "something green" hanging from them and we could only imagine that either they or a tree that had been removed were indeed the original "source" tree for the lichen.

Lichens identified on this trip by the following CALS members, Sara Blauman, Don Brittingham, Kathy Faircloth, Bill Hill, Patti Patterson, Judy and Ron Robertson are:

Stop 1
Bacidia sp.
Cladonia bellidiflora (Ach.) Schaerer
C. macilenta Hoffm.
C. rei Schaerer
C. squamosa Hoffm.
Evernia prunastri (L.) Ach.
Hypogymnia enteromorpha (Ach.) Nyl.
H. imshaugii Krog
Lepraria sp.
Nephroma resupinatum (L.) Ach.
Ochrolechia oregonensis H. Magn.
Parmelia sulcata Taylor
Platismatia herrei (Imshaug) Culb. & C. Culb.
Tuckermannopsis orbata (Nyl.) M. J. Lai

Stop 2
Alectoria sp.
Bryoria sp.
Cladonia sp.
C. furcata (Hudson) Schrader
C. pyxidata (L.) Hoffm.
Lobaria pulmonaria (L.) Hoffm.
Ochrolechia oregonensis H. Magn.
Peltigera collina (Ach.) Schrader
Pertusaria amara (Ach.) Nyl.
Platismatia glauca (L.) Culb. & C. Culb.
P. herrei (Imshaug) Culb. & C. Culb.
Pseudocyphellaria anthraspis (Ach.) Magn.
Sphaerophorus globosus (Hudson) Vainio
Tuckermannopsis orbata (Nyl.) M. J. Lai
Usnea arizonica Mot.
U. ceratina Ach.
U. filipendula Stirton

Stop 3 (rock)
Aspicilia sp.
Caloplaca sp.
Candelariella sp.
Dermatocarpon intestiniforme (Körber)
D. miniatum (L.) W. Mann
Diploschistes actinostomus (Ach.) Zahlbr.
D. scruposus (Schreber) Norman
Lecidea atrobrunnea (Ramond ex Lam. & DC.) Schaerer
Leptochidium albociliatum (Desmaz.) M. Choisy
Leptogium lichenoides (L.) Zahlbr.
Lichinella nigritella (Lettau) Moreno & Egea
Ochrolechia upsaliensis (L.) A. Massal
Pannaria sp.
Peltigera sp.
Peltula euploca (Ach.) Poelt
Pseudocyphellaria anomala Brodo & Ahti
Psora nipponica (Zahlbr.) Gotth. Schneider
Psora sp.
Trapeliopsis wallrothii (Flörke) Hertel & Gotth. Schneider
Umbilicaria phaea Tuck.
Xanthoparmelia sp.

Stop 3 (other)
Bryoria sp.
Cladonia fimbriata (L.) Fr.
C. transcendens (Vainio) Vainio
Collema sp.
Lepraria sp.
Leptogium corniculatum (Hoffm.) Minks
Letharia vulpina (L.) Hue
Lobaria pulmonaria (L.) Hoffm.
Nephroma resupinatum (L.) Ach.
Ochrolechia subpallescens Vers.
Parmelia hygrophila Goward & Ahti
Peltigera sp.
Physconia isidiigera (Zahlbr.) Essl.
Pseudocyphellaria anomala Brodo & Ahti
P. anthraspis (Ach.) H. Magn.
Sticta fuliginosa (Hoffm.) Ach.

Stop 4
Bryoria fuscescens (Gyelnik) Brodo & D. Hawksw.
Candelaria concolor (Dickson) Stein
Chrysothrix candelaris (L.) J. R. Laundon
Cladonia sp.
Hypogymnia enteromorpha (Ach.) Nyl.
Leptogium corniculatum (Hoffm.) Minks
Letharia vulpina (L.) Hue
Ochrolechia juvenalis Brodo
O. subpallescens Vers.
Peltigera sp.
Platismatia glauca (L.) Culb. & C. Culb.
P. herrei (Imshaug) Culb. & C. Culb.
P. stenophylla (Tuck.) Culb. & C. Culb.
Thelomma occidentale (Herre) Tibell
Trapeliopsis flexuosa (Fr.) Coppins & P. James
T. granulosa (Hoffm.) Lumbsch
Tuckermannopsis chlorophylla (Willd.) Hale
Usnea sp.

Stop 5
Same as Stop 4 plus:
Cladonia chlorophaea (Flörke ex Sommerf.) Sprengel
C. ochrochlora Flörke
Parmelia hygrophila Goward & Ahti
P. saxatilis (L.) Ach.

Stop 6
Usnea longissima Ach.

Reported by Sara Blauman

CALS field trip In Search of *Verrucaria tavaresiae*
May 1, 2004

It was a beautiful May Day when 10 lichen enthusiasts started from the Bear Valley Visitors Center, Point Reyes National Seashore on this excursion to see the only lichen with a brown algal photobiont, *Verrucaria tavaresiae* Moe. Dr. Dick Moe, who first described the lichen in the CALS bulletin Vol. 4 No. 1, gave us a history of its discovery. The lichen was first collected at Moss Beach, San Mateo County by M. Wynne. Wynne isolated the alga into culture discovering that it was the crust-forming *Petroderma maculiforme* (Wollny) Kuckuck. Wynn's report was referenced in handbooks and textbooks, but it took the interest of Dr. Moe, working at the UC Berkeley herbarium, to investigate and ultimately describe the species. This day, Dick was going to show us the largest population he has located along the coast.

The Arch Rock trail is 4 miles from the parking lot to the water's edge. The low tide was to occur about 3 pm so we knew we could leisurely walk from the parking lot as we started about 10:30am. The Arch Rock trail is riparian habitat through coniferous forest. Poison oak and nettle line much of the trail, keeping walkers on the well used path. Notable were the 2 sightings of the delicate yellow pin lichen *Chaenotheca furfuracea*, first on roots of a fallen tree and second on a rock surface of a shaded trail bank.

Many spent the time looking at the wildflowers in bloom along the trail. We ate lunch in the meadow at the half way point. Finally to the coast, we crossed the creek, scrambled up and down some steep cliffs, and made it to the shore just south of Arch Rock. Dick led us directly to our goal and we were treated to a lovely display of *V. tavaresiae*. Dick's observation is that it occurs on the shady side of the rocks in the low *Fucus* zone. When wet, it is difficult to distinguish from the crustose red alga *Mastocarpus papillatus*, however upon drying, the perithecia appear rimmed with black and the entire lichen thallus turns dark brown with a thin, blackish-brown margin. Cracking of the thallus also occurs upon drying. Dick also pointed out *Pyrenocollema* sp. growing in the same habitat.

After scrambling on the coastal rocks, getting a good visual image of the lichen, we climbed back up to Arch Rock. From there, we could see whales moving north along the coast. We arrived back at the parking lot at 5:30. Dick claimed that with seeing *V. tavaresiae*, we would now all be better able to spot this lichen at other places along the coast. I think he is right. Thank you Dick, for leading this trip.

Participating were Judy and Ron Robertson, Sara Blauman, Bill Hill, Susi Alterman, Brad Kelley, Jon Carter, Lora Collins, Mikki McGee and Dick Moe.

Reported by Judy Robertson

Upcoming Events

Lichen Walk at Fort Ross State Park, Mendocino Co.
Saturday, July 24, 2004 10:00am

Fort Ross was established in 1812 by Russians as an outpost for sea otter hunters and a permanent trade base. It was the southernmost outpost of a Russian presence in the Pacific Northwest. The Russians remained at Fort Ross until sea otters became scarce in 1841. The holdings were sold to John Sutter, who later became famous when gold was discovered at his saw mill in the Sierra Nevada foothills.

None of the original fort structures remain, however several buildings have been reconstructed: the first Russian Orthodox chapel south of Alaska, the stockade, and three other buildings, including the Commander's House, which contains exhibits of the Russian-American Fur Company and the Russian occupation.

Join us at 10 am for a lichen walk (no collecting permitted). Depending upon the energy of the group and the weather, we could end at noon or stay for the afternoon. Bring a lunch, just in case.

Location Directions**:**
The park is 12 miles north of Jenner on Highway One. From Highway 101 there are two routes to the fort:

From Petaluma
Highway 101. Take the East Washington Street exit. Go west (left). Washington turns into Bodega Avenue, which after a few more name changes, turns into Highway 1 North and takes you to Bodega Bay. This route is a straight shot – much easier to drive than it looks on the map. At Bodega Bay, follow Highway One North.

From Santa Rosa
Highway 101. Go past downtown exits for Santa Rosa. Just north of town, take the River Road exit. Go west (left). River Road will turn into Highway 116 in Guerneville. Follow 116 west, then follow signs to Highway One North towards Jenner and Fort Ross.

From the North
Take Highway 1 from Fort Bragg and go south about two hours drive. We are about 16 miles from Stewart's Point. Approximate driving times from... Santa Rosa – 1 1/2 hours; San Francisco – 3 1/2 hours; Sacramento – 3 1/2 hours; Fort Bragg -- 2 hours.

North Side of West Peak, Mt. Tamalpais State Park, Marin Co.
Saturday, August 21, 2004 10:00am – 2:00pm

Just north of San Francisco's Golden Gate is Mount Tamalpais State Park, 6,300 acres of redwood groves and oak woodlands with a spectacular view from the 2,571 foot peak.

On a clear day, visitors can see the Farallon Islands 25 miles out to sea, the Marin County hills, San Francisco and the bay, hills and cities of the East Bay, and Mount Diablo. On rare occasions, the Sierra Nevada's snow-covered mountains can be seen 150 miles away.

Coastal Miwok Indians lived in the area for thousands of years before Europeans arrived. In 1770, two explorers named the mountain La Sierra de Nuestro Padre de San Francisco, which was later changed to the Miwok word Tamalpais. Join us for this lichen walk on the North side of West Peak. The trail will take us through serpentine, cypress and mixed evergreen habitats. The walking is cross country and may be uneven in parts. We will meet at the Rock Spring parking lot at 10 am and carpool to the starting site only 10 minutes away. Bring a lunch. Weather at the Mt. Tam State Park is very unpredictable. Be prepared.

Location Directions:
From Highway 101 take the Stinson Beach turnoff. Follow the signs to Stinson beach (this will be Panoramic Highway) until you get to the Pan Toll Ranger Station. At the Y in the road go to the right (Pantoll Rd.). Where Pantoll Road meets Ridgecrest road is the Rock Spring Parking lot.

Modoc County, CA
September 25-27, 2004

Modoc County is in the northeast corner of California and has been little explored for lichens. CALS member Cheryl Beyer is now working for the forest service in this area and has encouraged CALS to visit to map the lichens there. Birders will have an extra bonus as there are many wildlife refuges close by. We will map lichens in the Warner Mountains which have the highest elevations. There is a paved highway over Cedar Pass, close to 6000', with a 3 mile trail. Rush Creek and the Medicine Lake Highlands are other places we could visit. Also, Lava Beds National Monument is close by. Cheryl is going to explore the area this summer for more details.

We may be able to stay in BLM barracks, but are still awaiting confirmation. Otherwise, there is camping at Big Sage in the Modoc National Forest and there are motels in Alturas.

We will start Saturday morning (9/25) and explore and collect through Monday (9/27) about noon.

Watch for more information on the CALS Yahoo Web site or contact Judy Robertson.

Jasper Ridge Ecological Preserve, Santa Clara Co.
Saturday, October 16, 2004 10:00 am to 2:00 pm.

Back in 1997, CALS planned a field trip to Jasper Ridge but it was rained out. Let's try again. Jasper Ridge is owned and operated by Stanford University. It is 1200 acres of a variety of habitats – chaparral, serpentine grassland, oak woodland and riparian. Much of it is used in research projects by students and staff at Stanford. Accessibility is limited and the public rarely has the opportunity to enter.

Join us for a lichen walk in this interesting area of Santa Clara County. Entrance to the Preserve is locked so we will meet at the gate on Sandhill road at 10 am. and enter the area as a group. Bring a lunch.

From Highway 280 take the Sandhill road exit to the west. The gate will be in the left after the Whiskey Hill Road intersection.

Robert Louis Stevenson State Park, Palisades Trail, Napa Co.
Saturday, November 13, 2004 10:00 am to 3 pm.

Robert Louis Stevenson State Park is the place where the famous author of Treasure Island and Kidnapped spent his honeymoon in 1880. Although nothing remains of Stevenson's cabin, the site is identified on the trail to the summit.

On this day, we will not follow the trail to the summit of Mt. St Helena, but will go to the east on the Palisades Trail. The walking will be through mixed evergreen and chaparral with many volcanic outcrops. Take Highway 29 from Calistoga and meet at the Park parking lot at 10am. Bring a lunch.

December 2004 activities

Look for the San Francisco Mycological Society Mushroom Fair with our CALS exhibit in December, 2004.

Ongoing lichen identification workshops
Darwin Hall, Room 207, Sonoma State University
The 2nd and 4th Thursday of every month, 5 pm to 8:30 pm.

Join us every 2nd and 4th Thursday of each month for these Lichen ID sessions at SSU. We bring our specimens, use the classroom dissecting and compound scopes and a variety of keys to identify them.

We help one another at difficult places in the keys and get feedback about our methods. This is a great time to work on those specimens you have collected but have not had time to ID, those that you have had difficulty identifying or just learning about lichens. We have snacks and enjoy hearing about the latest good collecting spot. There is no cost for our workshops but be prepared to pay a $2.50 parking fee.

Contact for the field trips and workshops: Judy Robertson, 707-584-8099 <jksrr@aol.com>, 362 Scenic Ave., Santa Rosa, CA 95407.

Announcements

Minutes of the California Lichen Society
General Meeting January 31, 2004

Location:
The meeting was called to order by President Bill Hill at 7:55 pm, January 31, 2004, at the Brickyard Landing Clubhouse in Point Richmond following the Mt. Diablo field trip and annual potluck dinner.

Officers Present:
Bill Hill, President, presiding
Boyd Poulsen, Vice President
Judy Robertson, outgoing Secretary
Sara Blauman, incoming Secretary
Stephen Buckhout, outgoing Treasurer
Kathy Faircloth, incoming Treasurer
Tom Carlberg, incoming Bulletin Editor, Member at Large
Richard Doell, Bulletin Producer

Minutes:
The minutes of the General Meeting January 11, 2003 were read by Judy Robertson, Secretary, and accepted by all attending.

Treasurer's Report:
Stephen Buckhout, Treasurer, reported a CALS balance of $11,276.81.

Committee Reports:
Conservation Committee – In Chairperson Eric Peterson's absence Tom Calberg reported on the *Usnea longissima* issue. There will be a field trip by invitation only on PALCO lands and a subsequent discussion in an open meeting in Redding (date TBD).

Mini-guide/Poster Committee – President Bill Hill reported that CALS now has two Mini-guides, the old California Mini-guide and the new Southern California Mini-guide.

Education Committee – President Bill Hill reported that the student grant program was discussed at the Board Meeting.

Computer/Database Committee – President Bill Hill reported on database activities. Charis Bratt has entered all of the Santa Barbara Botanic Garden lichen collection into a stand-alone database developed by and provided to her by Arizona State University. CALS has modified it such that it can be used for other activities targeted by CALS such as cataloging the lichen collection at San Francisco State and the lichen collection at College of Marin.

Events Committee – Chairperson Judy Robertson asked for and received suggestions for future field trips and workshops. President Bill Hill mentioned the Sunday Morning Lichen Walks in Marin County as a possibility of a new style of field trip where lab work can accompany field work right in the field.

Old Business:
•Student Grants – President Bill Hill reported that last year CALS made one student grant of $500 and that the Board approved offering two grants of $500 and $750 for the upcoming year.
•CALS Library and Sharnoff Literature – President Bill Hill reported that CALS is a recipient of back issues of the Bryologist and other assorted literature from Steven Sharnoff and all is available for loan. Discussion of some form of distributed and/or online library ensued.
•California Lichen Calendar – President Bill Hill suggested that when Frank Bungartz stops publishing the Sonoran Desert Calendar that perhaps CALS could publish a California Lichens Calendar.

New Business:
•President Bill Hill asked if anyone would be interested in being a Public Relations Chairperson with the purpose of distributing information to various organizations regarding our events.
•A China Foray in August of 2004 with NAMA and Lawrence Glacy was announced.
IAL Meeting – President Bill Hill reported that the Board is currently considering hosting the 2008 IAL Meeting. The Board will focus on this issue in the next Board Meeting (date TBD).
•President Bill Hill announced the new Board:

Bill Hill – President
Boyd Poulsen – Vice President
Sara Blauman – Secretary
Kathy Faircloth – Treasurer
Tom Carlberg – Bulletin Editor
Richard Doell – Bulletin Producer

The meeting adjourned at 8:50 pm January 31, 2004.

Reported by Judy Robertson

(Announcements continued on p. 32

Bruce Ryan 1950-2004

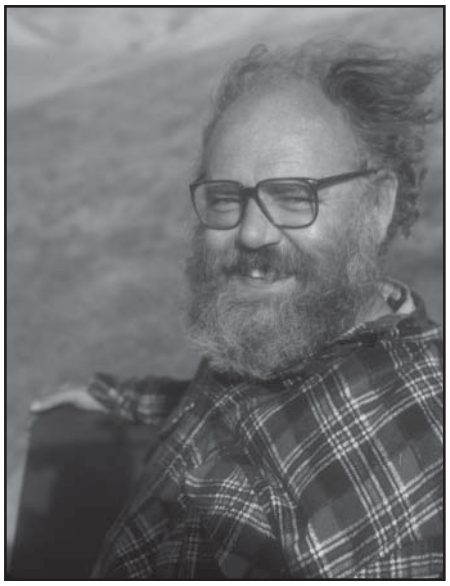

Photo courtesy Steve Sharnoff

Ah, Bruce! How I miss him! I first met Bruce in Colorado while we were both visiting Bill Weber. This was the summer before he started at ASU. In the years since I shared many adventures with Bruce. He visited in Santa Barbara several times and we went to the Islands as well as around Santa Barbara. Once we did a collecting trip along the coast from Monterey south to San Diego. Bruce was always available for advice on where to look for information on something. His willingness to help others seemed unbounded. For several years he wrote and distributed a folksy newsletter called "Bruce News." I wish I had saved them. They were among other things a humorous look at his life, copies of cartoons that he liked, lists of his current favorite songs and jokes (not always politically correct!). My favorite story was an account of his falling asleep in the student union and awaking to find that someone had taken his shoes and his subsequent adventure in the shoe store. Through all his problems and complaints, he somehow ended up with an optimistic attitude. Bruce may have been far from perfect, but he is leaving a huge legacy as well as a large vacuum behind. – Charis Bratt

Everyone who ever met Bruce Ryan will agree he was a most extraordinary individual. Although he had a vast knowledge of North American lichens, he was extremely modest and even self-effacing. His unpretentious manner and cheerful demeanor sometimes gave those who met him the idea that he was not to be taken seriously. Those who knew him better knew that he was among the most serious students of North American lichens, with a probing curiosity and high level of excellence. In all the research he did, whether studying maritime lichen zonation or the taxonomy of the often frustrating genus Lecanora, he approached his problem with close attention to scientific details. As a result, his publications will be sought as definitive treatments for many years to come and will form the basis for continuing research, something he would have applauded. He encouraged everyone, had a bad word for no one, and was a gentleman to all. We lost a real friend when we lost Bruce. – Irwin Brodo

From his early life Bruce was a collector, initially of sea shells and various animal groups. Along the way he became a competent artist, but then returned to science and chose to study lichens in his graduate days, during which he became strongly influenced by Josef Poelt (Graz, Austria), who had initially developed a classification framework for *Lecanora* subgen. *Placodium*. Bruce, of course, became a world expert in the group, and was one of the most knowledgeable lichenologists in our flora of western North America. Without his expertise, our Sonoran Lichen Flora is not likely to have become a reality. Vol. II will be dedicated to Bruce. We will all remember him for his humor and ability to laugh at the absurdities of life. His latter years were marked with a struggle against several illnesses, but he made peace with these challenges and his old humor returned during his final months. We have lost a good friend and a highly competent lichenologist. – Tom Nash

Bruce Ryan and I worked together revising the California lichen catalogue for the past nine years. His knowledge of west-coast lichens was both intensive and comprehensive, and he was generous in sharing that knowledge. His drive, even during his last illness, was unbelievable – he sent a 26-page set of corrections and updates just a month before his death. In person, Bruce was convivial, a chatterbox, stream-of-consciousness kind of guy. I miss Bruce every day – a great loss to lichenology, and a great loss personally for many of us. – Shirley Tucker

President's Message

Toasting the New Year over breakfast – January 1, 2003 Tempe AZ

So Bruce is gone. His body gave up the ghost January 21 this year after battling cancer for two years. The comfort of "just asking Bruce" about some obscure lichen specimen is gone. I remember the times I would bring a box of packets and have Bruce "process" them at the ASU herbarium, and catch every nuance of his mental journey to an identification with my video camera, hoping to somehow learn how he does it. Precious moments. And precious moments were those when we talked about everything else but lichenology in his funky apartment. A few years ago I had declared that my most effective contribution to lichenology was to be a "Bruce amplifier." While in Arizona for personal/family reasons I had scanned photos into his computer to help expedite his completion of some long overdue publications. And we upgraded his lichen keys for his famous CD from the original WordPerfect 4.1 format many of them were in.

I hope I have made some miniscule contribution through this effort. But what to do now? We're on our own. Luckily there are still other "lichen wizards" on the planet besides Bruce who can be "amplified." This can and is happening increasingly via the international planetary forum of the internet. Besides wonderful new traditional book publications such as Brodo and Sharnoffs "Lichens of North America" and the (Bruce amplified!) Sonoran Desert Flora, lichen keys are proliferating online often with good photos that are so essential for us beginners. A Google search quickly gives many references. There is Dr Sipman's great index of online keys at <http://www.bgbm.fu-berlin.de/bgbm/Staff/Wiss/Sipman/keys/>. Then there is Martin Grube's discussion of references: <http://webdb.uni-graz.at/~grubem/ialweb/Topics.html> especially for pointers to online photos including the wonderful ones at Nimis' ITALIC site <http://dbiodbs.univ.trieste.it/global/italic_ico>... The list goes on. I rediscovered Ed Uebel & Doug Greene's list of online lichen images at <http://users.erols.com/uebe/species.htm>. And don't miss our very own Eric Peterson's Lichen Key Archives at <http://www.toyen.uio.no/botanisk/lav/LichenKey/>.

So it is happening online. I dream of having us at CALS develop an online lichen identification forum/discussion group that captures the gleanings of our workshops. There we puzzle over specimens we have found, and come to conclusions about the characteristics which nail down the identifications – it would be nice to share our notes online with others, including images of these critical features, species by species. Then our identification discussions would let even beginners in on our mental journeys to our conclusions. We can continue with "Bruce's keys" online, filling in the blanks in matrices of characteristics for multidimensional computer keys. And do it together. Yes, I still want to be a "Bruce amplifier," but now it may be with the cyberland extension of his mind.

Another task we can share is the work of databasing the collections information of the various herbaria with California lichens. This would help in determining the ranges and partial distributions of many species. So many herbaria have nothing catalogued on computer yet! This is another place where amateurs can lend a significant helping hand

What new CALS developments have there been since the last bulletin? One thing stands out to me: our recent fieldtrip into Pacific Lumber Company (PALCO) forests in Humboldt County. There on March 20 some of our Conservation Committee and other members went to help clarify the rarity status of *Usnea longissima* in Northern California. PALCO just happens to be the apparent "epicenter" of the population where it festoons numerous trees and looks (misleadingly?) common there. The next day we had a well received conference at the California Department of Fish and Game office in Redding to discuss our observations. As a result we now have an invitation from the PALCO botanist to study lichens on their land. Progress, I would say. Several student projects could potentially come from this, including population viability studies that might answer questions about the impacts of various land management practices on *Usnea longissima*.

I want to thank again our past treasurer Stephen Buckhout and our past secretary Judy Robertson for a job well done, and commend our new treasurer Kathy Faircloth and new secretary Sara Blauman for taking over the tasks so well. Judy of course never really left as she leads the Thursday workshop at Sonoma State and plans our future fieldtrips. And we have consulted Stephen more than once over the details of the treasurer's task.

Bill Hill

(Announcements continued from p. 29)

Cautionary Message

Frank Dobson of the British Lichen Society sent the following message to the Lichen List Server regarding the use of household bleach to test for C reactions:

"Most lichenologists use domestic bleach as their source of sodium/calcium hypochlorite for the 'C' spot test. It has been noticed that a number of bleaches now contain other substances. These, no doubt, improve their efficiency for domestic use but cause a positive result when used for a spot test, giving a KC+ orange result. Before use in the field, it is suggested that you test any bleach on the medulla of *Parmelia sulcata* or *P. saxatilis* for this reaction. If you do not get a C- result use another brand of bleach.

Many of the cheaper supermarket brands seem to be the best."

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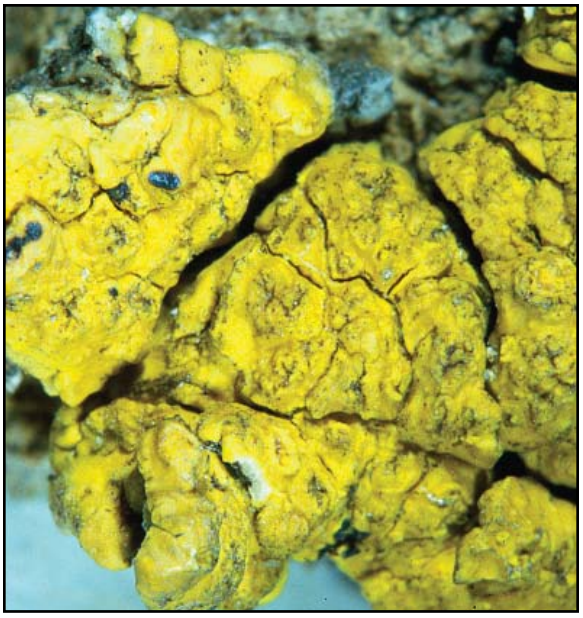
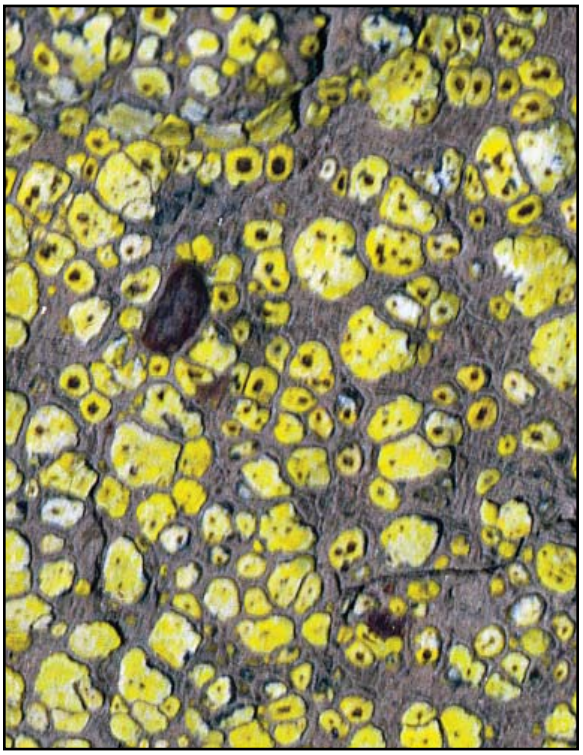
Selected Acarosporas

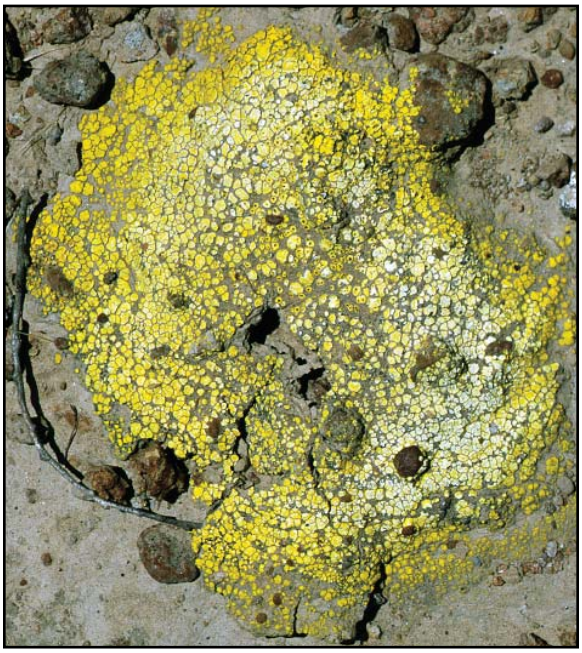
See article by Knudsen on p. 10.



A. evoluta H. Magn. Holotype. Collected by Kingman in California, Santa Cruz Mountains, Mayfield 1916 30x. Considered by Magnusson a synonym of *A. bella* (Nyl.) Herre. Photo by Robin Schoeninger.

A. schleicherie (Ach.) Massal. Isabella Tavares #112 30x. Photo by Robin Schoeninger.





Possible undescribed Acarospora on soil on Santa Cruz Island. Discovered by Charis Bratt. Magnifications unknown. Photos by Frank Bungartz.