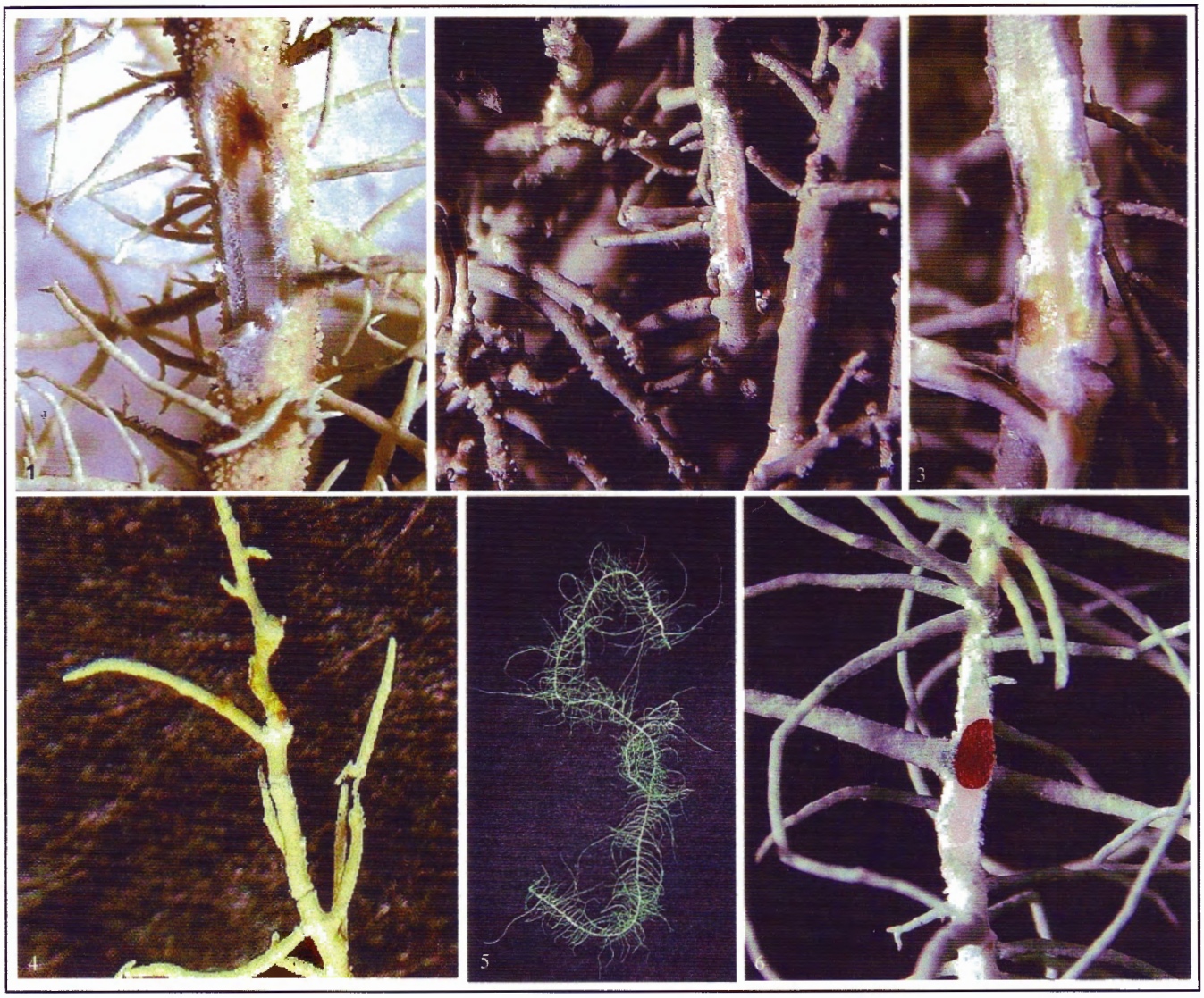
Bulletin of the California Lichen Society



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Front cover, figures 1-6 (See the article by Wright on Californian Usneas.)

1. *Usnea arizonica 4250*	Papillae, CMA section, spot test. ——— = 1 mm.
2. *Usnea ceratina 5030*	Branching, pink periaxial pigment, isidiomorphs. ——— ≈ 1 mm.
3. "	CMA, spot tests, dense medulla, thick cortex. ——— = 1 mm.
4. *Usnea glabrata 6499c*	Branch apices, PD test. ——— ≈ 1 mm.
5. *Usnea longissima 6952*	Habit, color. The thallus fragment was ≈ 15 cm long.
6. "	Interior, axis with IKI, right angle fibrils. ——— ≈ 1 mm.

Back cover, figures 7-15

7. *Usnea mutabilis 5714*	CMA, pigment. ——— = 1 mm.
8. *Usnea pacificana 6955*	Blackened base. ——— = 1 mm.
9. *Usnea rubicunda 5393*	Bands of pigment, fibrils (salazinic morph). ——— ≈ 1 mm.
10. " *5407*	Habit. Scale divisions = 1 cm.
11. " "	Sorediate pseudocyphellae. ——— = 1 mm.
12. *Usnea wirthii 6498*	Spots, CMA (thicker cortex and axis than normally seen), yellow periaxial pigment. ——— ≈ 1 mm.
13. *Usnea ceratina 5030*	Closeup from fig. 2. ——— ≈ 0.5 mm.
14. *Usnea mutabilis Bowler s.n.*	CMA, isidiomorphs. ——— = 1 mm.
15. *Usnea ceratina Moody s.n.*	Pigments, CMA. ——— = 0.5 mm.

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Some Species of the Genus *Usnea* (Lichenized Ascomycetes) in California

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Abstract: *Seventeen California species in the genus Usnea are discussed and illustrated with photographs. Observations on morphology, chemistry, distribution, and nomenclature are included, and thin layer chromatograms in 3 standard solvent systems are presented for most species.*

Significant attention has been focused on Pacific Coast *Usnea* in the last 6 years (Halonen et al. 1998; McCune 2000, McCune and Goward 1995, Tavares 1997) with the result that a much improved understanding of the region's species than existed prior to 1995 has emerged. This article presents 17 species, mostly common ones but including some uncommon ones (which may require environmental protection at some point) in a format which, I hope, will promote recognition in the field as well as under the dissecting 'scope.

For many species, distributions are not well known (Tavares 1997), but a few things can be said about some species with respect to climate. For purposes of this discussion, which is based on observations chiefly in Humboldt and Marin Counties but including some from Sonoma and Mendocino Counties, a hypermaritime zone (cf. Goward et al. 1994) may be taken as corresponding to the North Coast (NCo: the abbreviations are those used on the Jepson Manual maps) and Central Coast (CCo) subregions of the Jepson Manual (Hickman 1993) and a "maritime" zone to the westernmost Klamath Ranges (KR), the Outer North Coast Ranges (NCoR), San Francisco Bay (SnFrB), and Outer South Coast Ranges (SCoR). The hypermaritime, as measured on the Jepson Manual map, p. 45, varies from about 5 km to 20 km in width and is characterized in the northern part of the state by *Usnea cornuta* and *U. rubicunda*. Further inland, in the maritime zone, which is much wider, *U. ceratina* and *U. cavernosa* come in, and *U. arizonica* makes a modest appearance, becoming well-developed in the less wet inland valleys still further east (Sonoma-Santa Rosa Valley in Sonoma Co., part of Ross Valley in Marin Co.). While the hypermaritime species range into the maritime, a number of the maritime species (e.g., *U. arizonica*, *U. cavernosa*) enter the hypermaritime seldom or not at all. I know of no published, climate-oriented *Usnea* sampling, although I performed an observational transect on the Stewart's Point-Skaggs Springs Road from Healdsburg in Sonoma Co. to the ocean where *Usnea* species appeared in the sequence *U. arizonica* (Lake Sonoma near Healdsburg, 30 km from the coast), *U. rubicunda* (ca. 15 km from the coast), and *U. wirthii* (6 km from the coast).

Usnic acid, which I do not list in the chemical contents, is presumably present in all thalli but is sometimes in such low concentration (at least in the fragment extracted) that it will not be detected by TLC, even though other secondary products are in normal concentration (e.g., figs. 65-67, lane 4). "Isidiomorph", a term introduced by Clerc and Herrera-Campos (1997), refers to isidia arising from soralia ("germinating" soredia) rather than from the cortex. "CMA" refers to the ratios of cortex, medulla and axis widths to the width of the whole branch (Clerc 1987).

Unless otherwise indicated, collection numbers are mine, and all collections are in my herbarium.

Usnea arizonica Mot.

4250, figs. 1, 16.

Shrubby; generally erect; fertile; papillae cylindrical, +/- uniformly distributed.

K+ yellow becoming deep red orange: salazinic acid only (figs. 65-67, lane 2).

Fertile forms from small and erect with tiny apothecia to large and decumbent or prostrate with large apothecia are found, most with salazinic acid, and may include more than 1 species. Immature, non-apotheciate individuals can sometimes be recognized by having irregular swellings at the apices (I. Tavares cited in Doell and Wright 1996).

The relationship of this taxon to *Usnea rigida* (Ach.) Mot. with protocetraric rather than salazinic acid needs to be investigated to verify that the two are not better thought of as chemotypes of the same species (Motyka's descriptions of *U. rigida* and *U. arizonica* are very similar). *U. rigida* (Ach.) Mot. was cited for British Columbia by Halonen et al. (1998), but the combination with Motyka's name seems never to have been formally published (Wright and Hill, in prep.); the combination with Röhling's name, used by Motyka (1936-38), is invalid (Röhling 1813; Laundon 1965).

Widespread in the maritime and interior zones, not observed in the hypermaritime. Known from Contra Costa (Baltzo 1989); Humboldt, Marin, Mendocino and Sonoma Counties (Wright unpubl.); Arizona (Ryan, unpubl. Sonoran Desert keys); New Mexico, Mexico (Motyka 1936-1938). Ryan (1994-99) reports "occasionally K-, PD+", suggesting *U. rigida*. Both *U. arizonica* and *U. rigida* appear to be mostly absent from Oregon (B. McCune, pers. comm.) and Washington.

Usnea cavernosa Tuck.

6615, figs. 17-19. The species epithet would refer to the pits (foveolae) in the cortex.

Pendent; branches conspicuously ridged, pitted and flattened at the nodes; axis sinuous (varying in position relative to the sides of the branch); soralia, isidia, and papillae lacking.

K+ yellow becoming red-orange: salazinic acid only (figs. 65-67, lane 3).

Much more strongly angled-prismatic and flattened at the nodes than *Usnea scabrata*. Comparatively xerophytic but ranging far west into the maritime zone in Humboldt Co. (Bald Mountain), Marin Co. (Lagunitas Canyon), and Mendocino Co. (Branscomb Rd., Laytonville); Washington, western Oregon, and the northeastern U.S. (Hale 1979). At the Bald Mountain Rd./Snow Camp Rd. intersection, Humboldt Co., there is a locally recurring variant with branches which are strongly segmented with wide, partly corticated annular cracks giving a "bamboo" appearance (*6959*). It has been observed also by D. Glavich (pers. comm.). Next to *U. rubicunda*, *U. cavernosa* is perhaps the easiest Californian species to recognize in the field because of the very distinctive surface morphology (fig. 18).

Usnea ceratina Ach.

5030, figs. 2, 3, 20, 21; *M. Moody s.n.* [HSU], 10-25-98, figs. 15, 22, 23, "tricolor" form.

Pendent; coarsely verrucose-soraliate, the soralia often with isidiomorphs; green rather than yellow green, often with white zones on cortex (seldom present in other California Usneas); pale pink pigment at medulla-axis interface.

K- or pale yellow; C+ yellow; KC+ brighter yellow; PD-, diffractaic acid (figs. 65-67, lane 3). At least one of the pigments of the "tricolor" form chromatographs, and this form is otherwise not identical with the common form where the only the medullary pigment is the pink periaxial one.

Occasional in the western part of the state (Hale 1979), not in the hypermaritime but approaching it as on the east side of seaward Bolinas Ridge, Marin Co., where it takes the place of *Ramalina menziesii* as one climbs the ridge (Teixeira Trail), and at Prairie Creek Redwoods State Park, Humboldt Co.; Oregon; Washington; the entire Rocky Mountains as mapped by Hale (1979), but not mentioned by McCune and Goward (1995); the Appalachian Mountains and beyond them in the northeastern U.S.

Tavares (1997) considers European *U. ceratina* distinct from Californian material on the basis of the larger cortical cells and refers this to *U. californica* Herre. The form with a tricolor medulla (white-pink-yellow, moving in from the cortex (fig. 15), slight inflation, a flattened, non-pendent habit (suggestion of intermediacy with *U. cornuta*), and a somewhat different chemistry (figs. 62-64, lane 2) has turned up at two well-separated localities in Humboldt Co. and one in Del Norte Co., growing in at least 2 of those cases with "normal" *U. ceratina* and with *U. cornuta*. Although Herrera-Campos et al. (1998) observed apparently similar variations in Mexico and did not consider them significant, I have seen no intermediates with the typical form. Tavares (pers. comm.) suggests that a thorough study of Pacific Coast *U. ceratina* would be needed to settle this question.

Usnea chaetophora Stirton

6925, figs. 24, 25. (*chaetophora*, from Gk. *chaite*, bristle, and *pherein*, to bear.)

Pendent; slender branches with conspicuously frequent annular cracks, 6-15/cm, (Halonen et al. 1998), cortex otherwise mostly smooth.

K+ yellow becoming deep orange-red: salazinic acid only (figs. 65-67, lane 6).

North American distribution poorly known, rare in Europe (Halonen et al. 1998). Found flourishing on *Umbellularia* at Lyon's Ranch State Park, Humboldt Co. (mainly

conifers: Halonen et al. 1998) in the maritime zone. Apparently uncommon. In *6925*, fibrils are not only irregularly distributed as observed by Halonen et al. (1998) but are few (sometimes abundant [Ryan (1994-1999]) and vary from small to tiny.

Usnea cornuta Körber
6743, figs. 26-29.

Erect; inflated; cortex shiny, thin; medulla wide, sparse; axis narrow; soralia punctate or at least less than half the branch diameter but often confluent and appearing larger; generally plainly papillate at least on some branches.

An array of ß-orcinol depsidones mostly reacting K+ yellow to red; all reacting yellow to red-orange with PD (figs. 65-67, lane 5). Goward (1999) reports three chemical variants from British Columbia.

This member of the *U. fragilescens* aggregate differs from *U. glabrata* by its punctate soralia which bear isidiomorphs, by its K-, PD+ red-orange spot tests, and its apparent absence from the hypermaritime. *U. cornuta* is usually K+, PD+ yellow to orange (not the red-orange characteristic of fumarprotocetraric acid) and is common in the hypermaritime, ranging into the outer maritime. Tavares (1997) notes that our material appears to be intermediate between *U. cornuta* and *U. fragilescens* Havaas *ex* Lynge: *6743* shows this intermediacy.

Usnea filipendula Stirton
5916, figs. 30-32.

Pendent; fibrils in fishbone pattern; tall, cylindrical papillae on at least some branches; no flat bottomed pits (cf. *U. scabrata s.l.*) or ridged branches; foveolae few or lacking.

K+ yellow becoming deep red-orange: salazinic acid only (figs. 65-67, lane 7).

Goward (1999) observes apparent intergradation of *Usnea filipendula* with *U. scabrata* and *U. chaetophora* in British Columbia. The species has xerophytic capabilities allowing it to range from the outer maritime at least to the inner maritime, not found in the hypermaritime. Takes the place of *Ramalina menziesii* on *Quercus kelloggii* at the Larabee Buttes east of Bridgeville, Humboldt Co. Present but not well developed towards the outer maritime on Monument Ridge, Humboldt Co. with *U. longissima* and the slender form of *U. scabrata s.l.*

Usnea glabrata (Ach.) Vainio
6499c, figs. 4, 33-35.

Erect, small; inflated branches; large, +/- tuberculate soralia near the apices, without isidiomorphs; papillae mostly lacking.

K-, PD+ red-orange: protocetraric and fumarprotocetraric acids (figs. 65-67, lane 8); small amounts of depsides and satellite depsidones also reported (Halonen et al. 1998). Only fumarprotocetraric acid is demonstrated in *6499c*.

Maritime, not hypermaritime. A small species of the *Usnea fragilescens* aggregate with the inflated branches, thin cortex; wide, sparse medulla; and narrow axis typical of that group. Distinctive in view of the chemistry (including the spot test results).

Usnea glabrescens (Nyl. *ex* Vainio) Vainio *s.l.*
5715, figs. 36-38.

Erect to subpendent; soralia wide, raised to slightly excavate, mostly without isidiomorphs; inflation slight or none; cortex moderately thick, medulla wide, hyphae sparse; axis wide; papillae only on the main branches where they are plentiful.

K+ yellow becoming deep orange-red: salazinic acid (figs. 65-67, lane 10) and other ß-orcinol depsidones.

Usnea glabrescens s.l. in the sense of Halonen et al. (1998) includes *U. fulvoreagens* (Räsänen) Räsänen. Clerc (1987) draws a sharp distinction between *U. glabrescens* (mature soralia plane or slightly concave, widely spaced; no fibrils on apices) and *U. lapponica* Vainio (mature soralia excavate, often confluent; apices fibrillose). Other authors writing on Pacific Coast *Usnea* do not refer to the abundance of fibrils on the branch apices (Goward 1999, Halonen et al. 1998, McCune 2000, Tavares 1997) and whether this character is useful for separating the two species in our region is unknown.

Usnea hesperina Mot.
5006, figs. 39-41.

Pendent; abundant annular cracks at base; soralia small and with isidiomorphs; narrow medulla, sometimes merely a thin fuzz on a massive axis; K-, PD+ orange.

Protocetraric acid (figs. 65-67, lane 11), occasionally with K+ yellow substances (Halonen et al. 1997).

Maritime (e.g., in Douglas-fir forest near the Visitors' Center, Pt. Reyes National Seashore, Marin Co.). Appar-

ently uncommon; rare in British Columbia, according to Goward (1999).

Usnea hirta (L.) F. H. Wigg.

Becking 99070014, figs. 42, 43.

Erect, small; +/- richly isidiate-fibrillose with slender fibrils which may be clustered; without inflation or papillae; base pale.

Murolic acid complex (fatty acids), only one spot seen in this collection (figs. 65-67, lane 12); cf. the murolic complex of *Usnea mutabilis 5714*) or norstictic acid (McCune and Geiser 1997); found once in British Columbia with diffractaic acid only (Halonen et al. 1998: this would be K-, CK+ golden).

Said to be characteristic of dry regions (see, e.g., Goward 1999, Halonen et al 1998), but *99070014* comes from the maritime (redwood) zone of Humboldt Co. (Cheatham Grove, Carlotta), and I have seen other collections from the maritime zone.

Usnea longissima Ach.

6952, figs. 5, 6, 44-46.

Long pendent; cortex on main branches crumbling, whitish; main branches with the axis taking up almost all of the interior and reacting blue with IKI; medulla poorly differentiated from the crumbling cortex.

Goward (1999) identifies one depside-depsidone (K+) and three depside (K-) chemistries, as well as usnic acid alone. Halonen at al. (1998) add a second depsidone chemistry with fumarprotocetraric acid. *6952* (K-, C-, CK+ yellow) from Monument Ridge, Humboldt Co., has diffractaic acid and a substance in classes 3-5-5 (figs. 65-67, lane 13) which is also yellow with H_2SO_4 and heat and may represent 4-O-demethylbarbatic acid (Halonen et al. 1998). The color of the axis with IKI is very dependent on the concentration of the reagent. The test is seldom needed to verify the identification. I found that the blue reaction may change to reddish on standing.

In California *Usnea longissima* is confined to the redwood zone (outer maritime: Doell and Wright 2000), and appears to do best high up in the light in wet, old growth forest, as at Jedediah Smith State Park, Del Norte Co. (S. Sillett, pers. comm.). Soredia are rare and have been verified from only one population (Monument Ridge, Humboldt Co.). The species can usually be recognized from the ground by the long, slender, whitish cross-draped thalli. I have not seen cross-draping in other Usneas except once in *U. cavernosa*; the phenomenon must be related to the ease with which the slender, flexuous thalli are moved about by the wind.

U. longissima is the subject of an ongoing conservation struggle in northern California, with the clear-cutting timber companies wanting to ignore it, despite its comparative rareness here. Although the species is protected under the California Environmental Quality Act (Section 15380: G. Leppig, California Department of Fish and Game, Eureka, pers. comm.), it is unclear if the conservation effort will succeed.

Usnea mutabilis Stirton

5714 (San Luis Obispo Co.), figs. 47, 48; *P. A. Bowler s.n.* (Baja California Norte), 4-13-96, fig. 14.

Shrubby, small, not inflated, mostly without papillae (cf. Clerc and Herrera-Campos 1997, p. 299), but with isidiose soredia on verrucae; strong red to purplish pigment throughout the medulla.

Fatty acids of the murolic acid group and acetone soluble red pigment(s). K- or pale yellow, C-; KC-; KC+ bright yellow, presumably due to the pigment(s) which are not the same as those in *Usnea ceratina* and *U. wirthii*; PD-. The fatty acids of the murolic group are visible on TLC plates without being wetted (figs. 65-67, lane 14; cf. Brodo 1991, p. 736). Note the identical, multiple spot chemistries of the San Luis Obispo collection and the 700 km distant Baja California collection (fig. 65-67, lane 15).

The commonest *Usnea* on Santa Catalina Island and present also on the other California Islands which have woodland, uncommon to rare on the mainland from San Diego Co. to Santa Cruz Co. (C. Bratt, pers. comm.).

Usnea pacificana Halonen

6955, figs. 8, 49-51.

At first erect, later +/- pendent; grayish green; branching mostly anisotomic; cortex rather thick; medulla narrow, dense, UV+ +; axis wide; soralia punctiform on tubercles, with isidiomorphs; prominently verrucose papillate.

K-, PD+ pale yellow: squamatic (UV++ blue white), barbatic (trace), and baeomycesic acids (figs. 62-64, lane 3).

Maritime: the British Columbia map, fig. 5, of Halonen (2000) suggests it has a wide ecological tolerance. This may be the first documented report (*6955*) for California. *Usnea pacificana* resembles *U. subfloridana* Stirton, which differs from it by the mostly isotomic branching, the yellowish green color, presence of cylindrical papillae,

soralia varying from punctiform to enlarged, and lack of baeomycesic acid. *U. subfloridana* is generally PD-, but if PD+ , then it is K+ deep yellow (thamnolic acid) rather than the pale yellow of baeomycesic acid. It seems to be rather common in the maritime zone of Humboldt Co.

Usnea rubicunda Stirton

5407, figs. 10, 11, 56, stictic chemotype; *5393*, figs. 9, 57, 58, salazinic-norstictic chemotype.

Pendent at maturity; orange to red-orange pigmentation of cortex sometimes uniform, sometimes in diffuse zones, some individuals mostly green; soralia abundant; papillae coarse; K+ yellow, persisting, not becoming reddish.

Stictic acid complex (*5407*, figs. 62-64, lane 4).

Locally common in the hypermaritime, reaching well back into the maritime. Easily recognized by the pigmentation, but there may be more than one species involved (I. Tavares, pers. comm., and my own observations). There is a form with the pigment in +/- sharply defined bands which sometimes spiral around the branch almost in candy-stripe fashion and which may correlate with a norstictic-salazinic acid chemistry (5393, fig. , K+ yellow becoming bright red); it is locally common at Pt. Reyes, Marin Co.

Usnea scabrata Nyl. s. l.

6567, figs. 59, 60.

Pendent; rather coarse, branches to 2 mm in diameter; cortex with low ridges and shallow, flat-bottomed pits; papillae of varying height and shape; soralia on warts.

K+ yellow to deep red: salazinic acid alone (figs. 62-64, lane 5). K- thalli have been reported from inland areas (Goward 1999; McCune 2000, "east of the Cascades").

The surface differs from that of *U. cavernosa* by the much less prominent ridges, foveolae (these are also fewer in *U. scabrata*), and flattening.

There is controversy regarding the relationship of *U. scabrata* to more slender *U. scabiosa* Mot. (branches to 1 mm in diameter, based on 5 specimens [Motyka 1936-1938, pp. 145-149, vs. 2mm for *U. scabrata* based on about 50 specimens]). Tavares (1997) separates *U. scabiosa* on papilla height and shape (maximum branch diameter might be added), but the descriptions of the two species given by Motyka are uncomfortably close, and Motyka observes that *U. scabiosa* is very similar to *U. scabrata* (p. 149). Assuming *McCune 25178* is the coarse morph (chromatography of Erin Martin, provided by Dr. McCune), the chromatograms (1 thallus each) of both morphs are identical and have salazinic acid alone. However, there *is* a slender, pendent morph from the outer maritime of Humboldt Co. with flat-bottomed pits and salazinic acid, which grossly looks rather different from coarse *U. scabrata* of the inner maritime in eastern Humboldt and western Trinity Counties. This, which I presented as *U. scabiosa* at the CALS/NWLG *Usnea* workshop earlier this year, is what is pictured and chromatographed here. Statistical evaluation (Clerc 1984a) of a suitably large sample of specimens should settle the issue, but for the moment I think *6567* is better referred to *U. scabrata s.l.*, (Halonen et al. 1998; McCune 2000; McCune and Geiser 1997, p. 302). Also interesting would be a molecular study to establish the genetic distance between *U. scabrata*, and *U. scabiosa*, and, as progressively farther removed outgroup taxa, *U. filipendula*, *U. ceratina*, and *U. longissima*.

Usnea (Neuropogon) sphacelata R. Br.

R. Ross s.n., 1-19-01, figs. 57, 58.

Erect to subpendent, on rock in arctic-alpine situations; branches with extensive black zones; annular cracks present; soralia convex, blackened; all spot tests negative.

Usnic acid only (TLC not reproduced).

I include this arctic-alpine species as one to be watched for in California, especially at high elevations in the Cascade Ranges, e.g., Mt. Lassen, and in the Klamath Ranges (Marble, Salmon, Scott, Scott Bar, and Siskiyou Mountains). Its closest known approach to California is in the Cascade Ranges of Oregon (McCune and Goward 1995). Motyka (1936-38, p. 18) observes "almost always" on rock as to the genus; there is a report of one New Zealand *Neuropogon* species on trees (Galloway 1985, p. 317), but Galloway doubts it.

I did not have a collection of *U. sphacelata* to photograph, but Bill Hill kindly furnished this material of *Usnea (Neuropogon) cf. granulifera* Mot. (K-, PD-, annular cracks lacking, soralia elevated) collected by Ronald Ross at Fenristunga, Antarctica, 71° 50' S, 8° 15' E, January 19, 2001; it gives a good idea of the *Neuropogon* appearance. A photograph of *U. sphacelata* is in McCune and Geiser (1997, p. 308).

Usnea wirthii Clerc
6498 (figs. 12, 64-66)

Shrubby, usually small; inflated; soraliate; papillate and with small red spots; medulla wide, sparse, pale yellow in a zone about the narrow axis; K+ yellow. Not all characters will be present in all specimens (true of *Usnea* species in general?).

Norstictic acid and two low running substances, one probably a pigment of the axis (*6498*: figs. 62-64, lane 12).

D. Glavich reports a population in a small woods near Portland Oregon, which contains both a form with narrow axis and thin cortex, typical of the *U. fragilescens* aggregate, and one with a wide axis and thick cortex, as pictured here (CMA% for *6498* is 13:22:30; cf. Clerc 1984b, protologue, where the CMA% of the type specimen calculates from the author's measurements to 12:17:43 vs. a more usual 10:29:22 (*6267*, canyon of Redwood Creek near Highway 299, Humboldt Co.). Norstictic or psoromic acid is present (but not both in the same thallus), not only in the soralia as sometimes claimed, but also, at least in some specimens, in the medulla. The "soralia", which in some cases may be producing corticate or semicorticate soredia (cf. the "blastidia" of Hawksworth et al. [eds.] 1995, also Swinscow and Krog 1974, p. 166) rather than typical non-corticate soredia, may react scarcely at all with K, as in the case of *6948*. One specimen (*4286* from an apparently unexceptional environment in Marin Co.) had 2 fatty acids without depsidones or medullary pigments. The yellow pigments of the axis are suspected of being bixanthones related to entothein (C. Culberson, pers. comm.; Wright unpubl.).

Widespread in the outer maritime and further inland in river canyons that receive much ocean fog (near Bridgeville in the Van Duzen River drainage, 50 km from the Pacific Ocean) over the entire length of the state, extending into British Columbia (Halonen et al. 1998) and Baja California, Mexico (collections of P. Bowler from chaparral on cinder cones at San Quintin, Baja California Norte).

I thank Doris Baltzo for a very helpful review.

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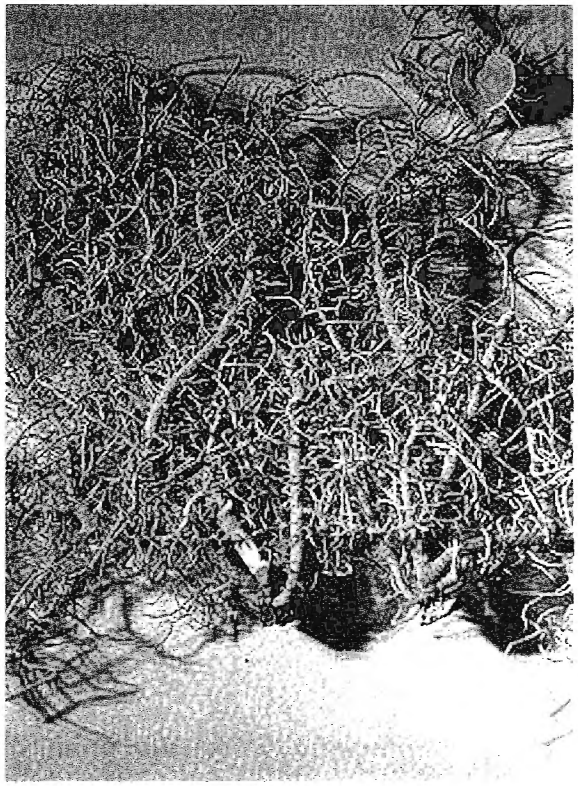

Fig. 16. *U. arizonica 4250*, habit. ———— = 5 mm

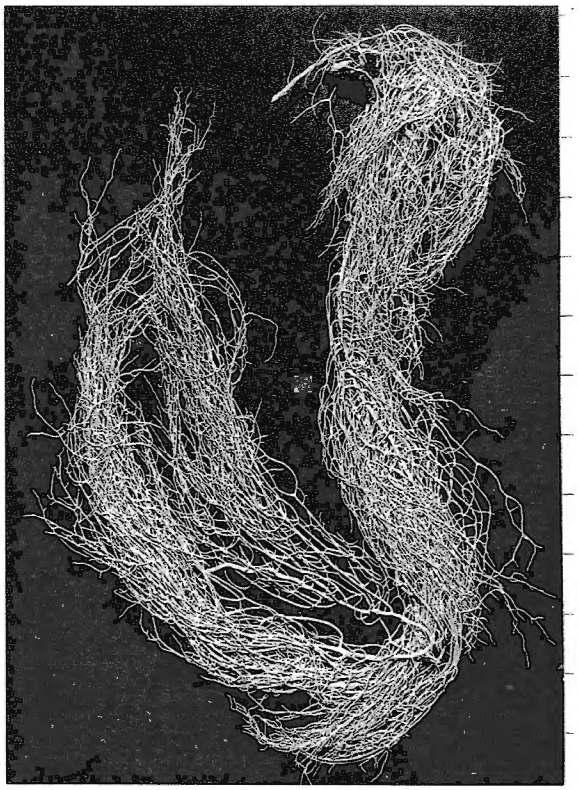

Fig. 17. *U. cavernosa 6615*, habit. Scale units = 1 cm

Fig. 18 *U. cavernosa 6615*, foveolae and ridges.
———— = 1 mm

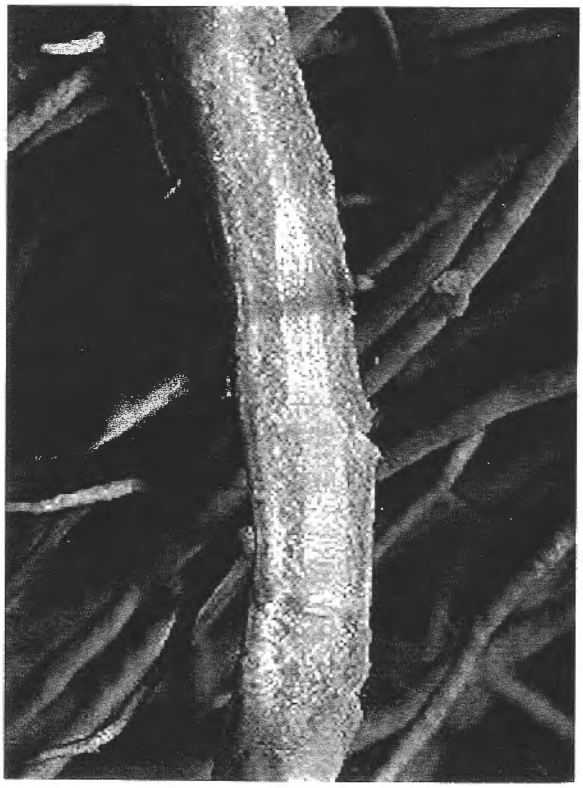

Fig. 19 *U. cavernosa 6615*, CMA, sinuous axis.
———— = 1 mm

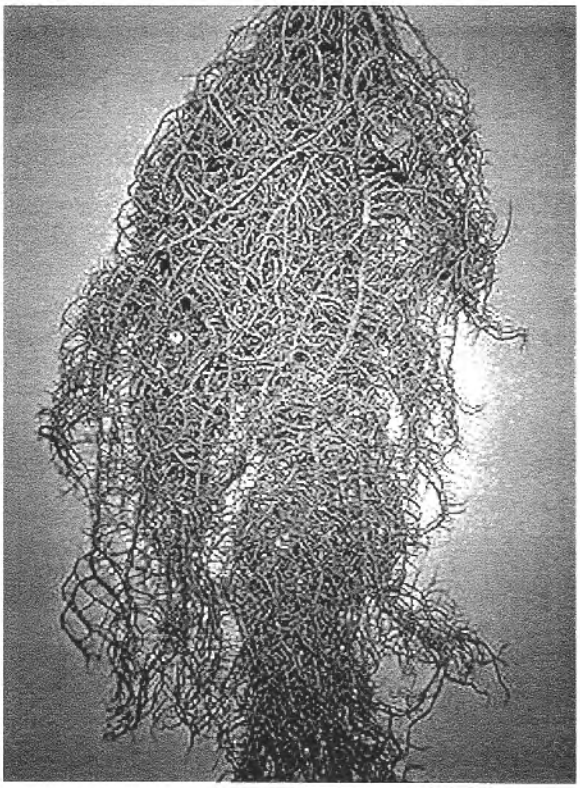

Fig. 20. *U. ceratina 5030*, habit. ~~~~~ = 1 cm

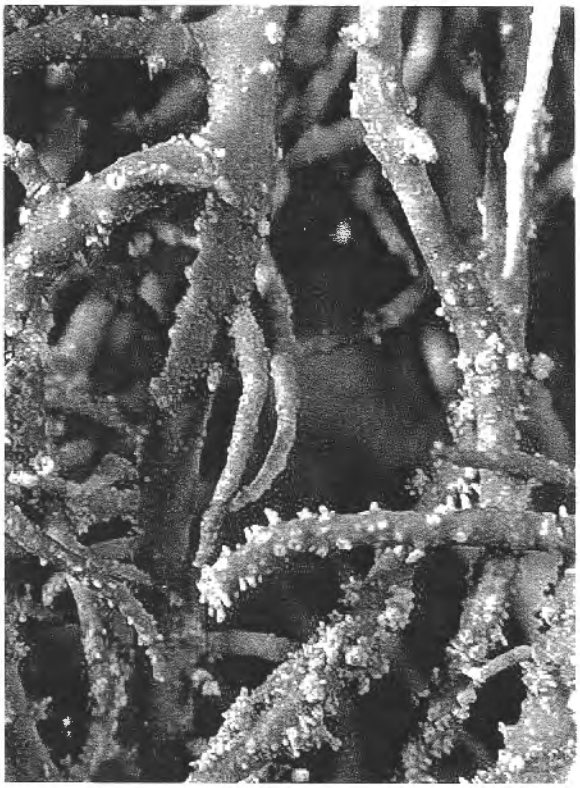

Fig. 21. *U. ceratina 5030*, verrucae, isidiose pseudocyphellae. ~~~~~ ≈ 1 mm

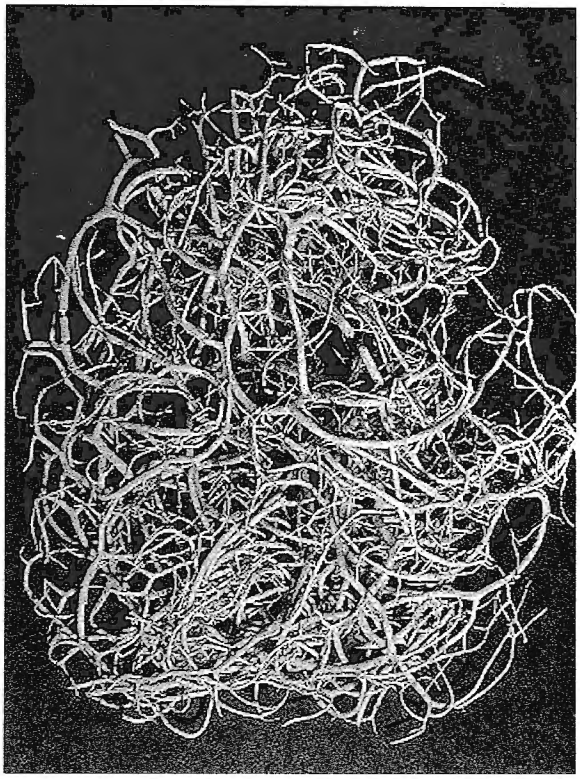

Fig. 22. *U. ceratina M. Moody s.n.* (3 medullary pigments), +/- appressed habit. ~~~~~ = 1 cm

Fig. 23. *U. ceratina M. Moody s.n.* (3 medullary pigments), sorediate verrucae. ~~~~~ ≈ 1 mm

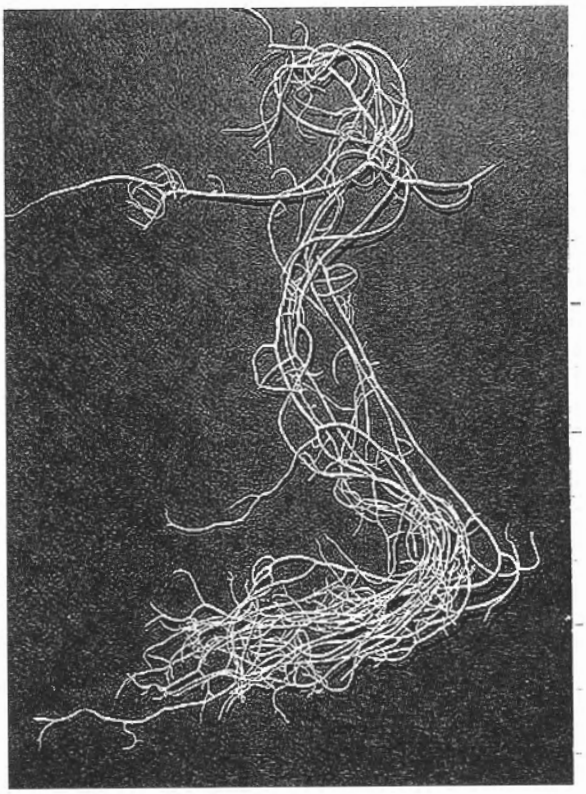

Fig. 24. *U. chaetophora 6925*, habit. 1 scale division = 1 cm.

Fig. 25 *U. chaetophora 6925*, abundant annular cracks, isidiose pseudocyphellae. ~~~~~~~~~~ ≈ 1 mm

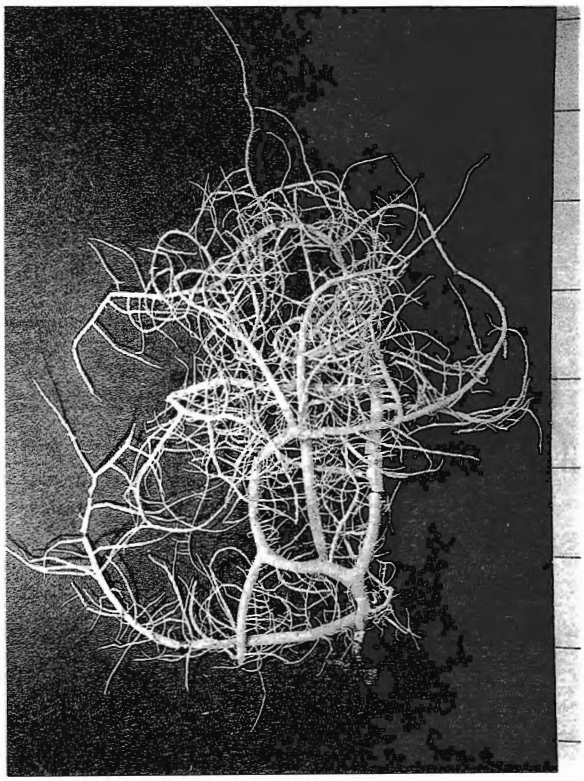

Fig. 26. *U. cornuta 6723*, habit. 1 scale division = 1 cm.

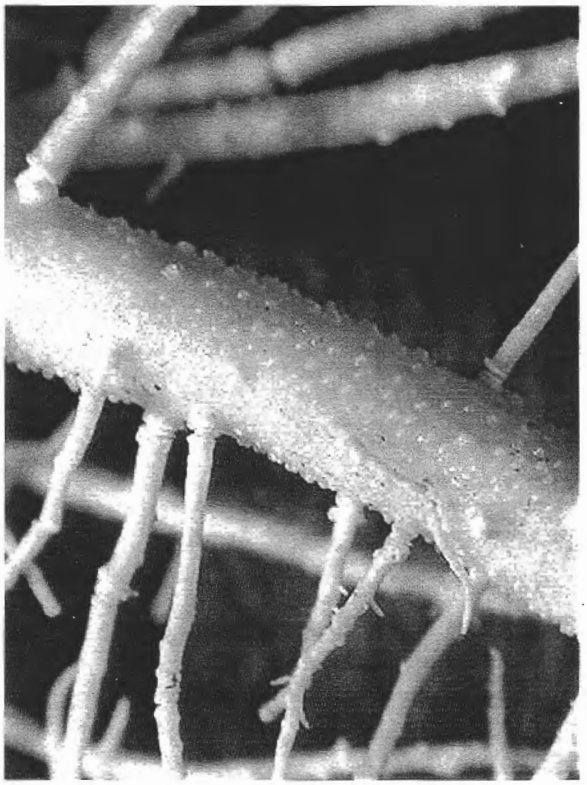

Fig. 27. *U. cornuta 6723*, papillae. ~~~~~~~~~~ = 1 mm.

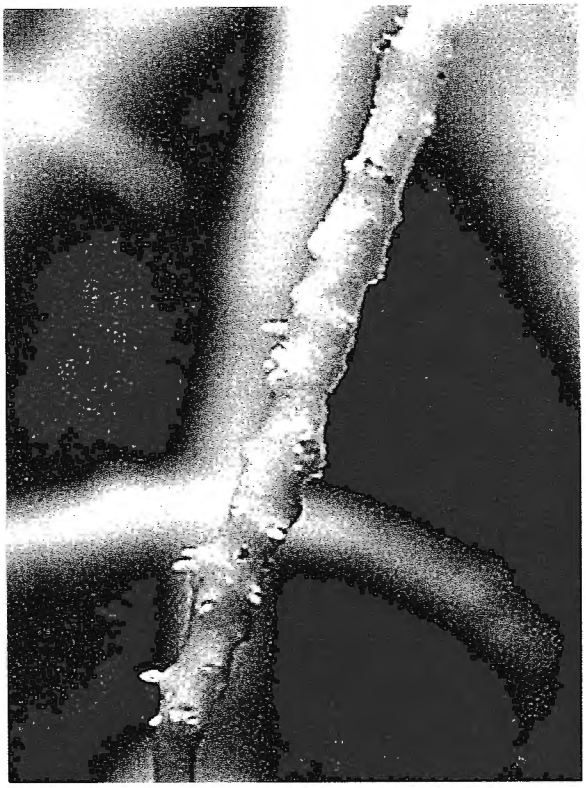

Fig. 28. *U. cornuta 6743*, isidiose pseudocyphellae. ——— = 0.5 mm.

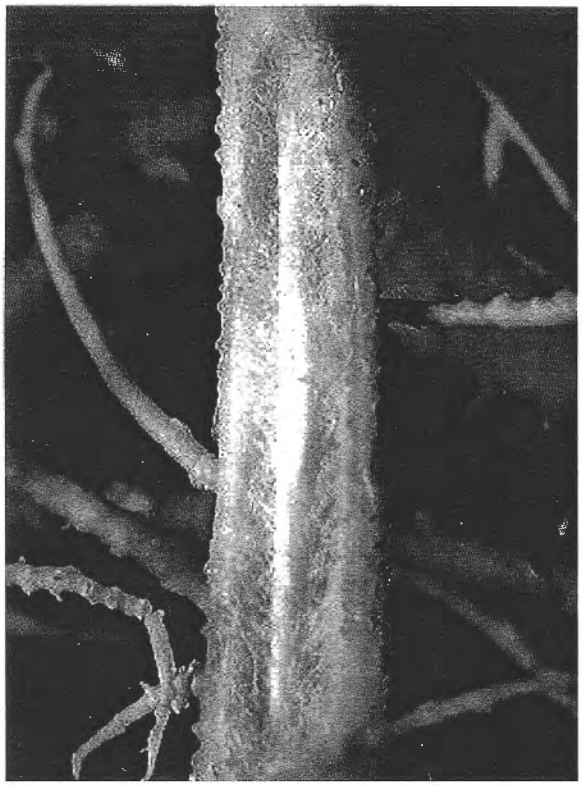

Fig. 29. *U. cornuta 6743*, CMA. ——— = 1 mm.

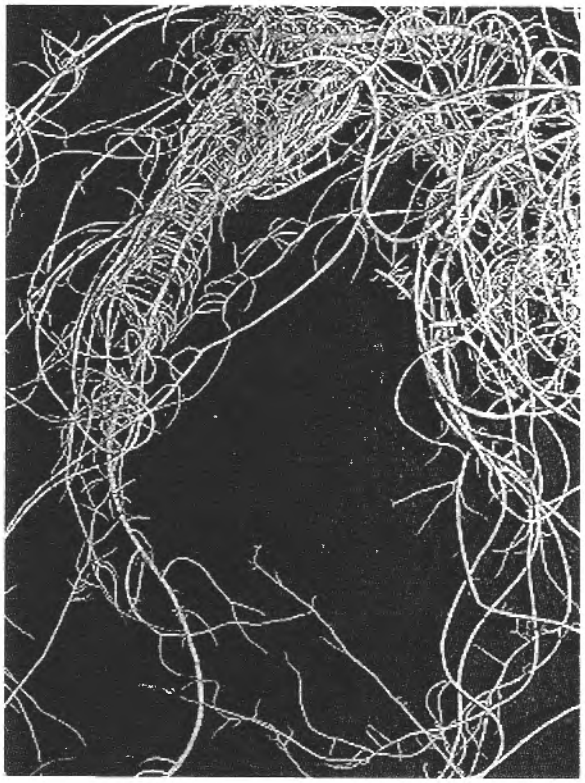

Fig. 30. *U. filipendula 5916*, habit. ——— = 1 cm.

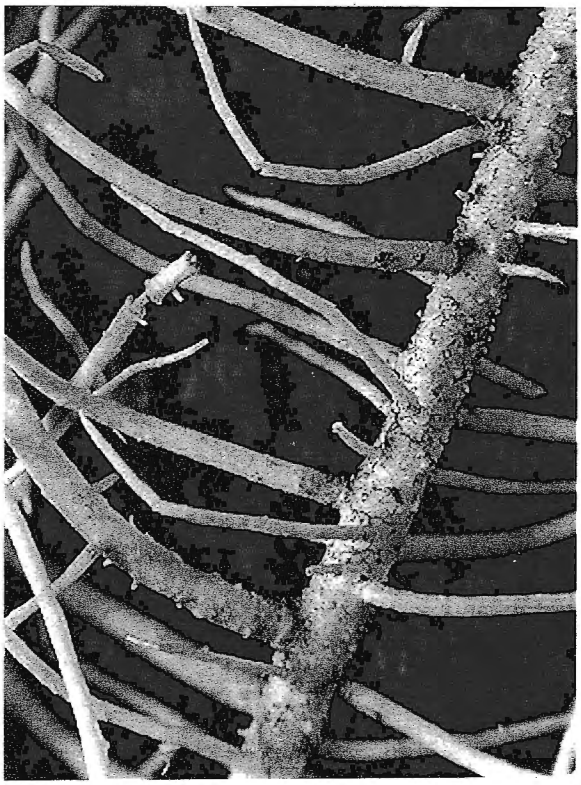

Fig. 31. *U. filipendula 5916*, fibrils in fishbone pattern. ——— = 1 mm.

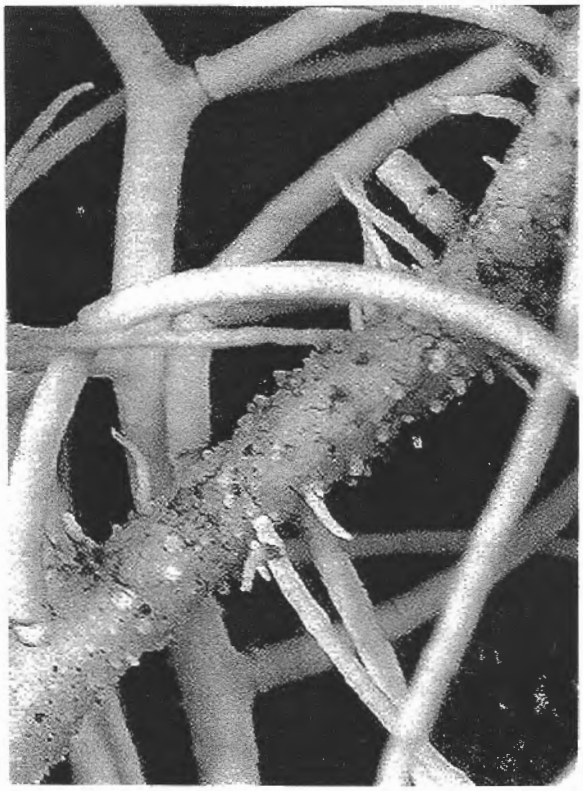

Fig. 32. *U. filipendula 5916*, papillae.
~~~~~~~~~~ ≈ 0.5 mm.

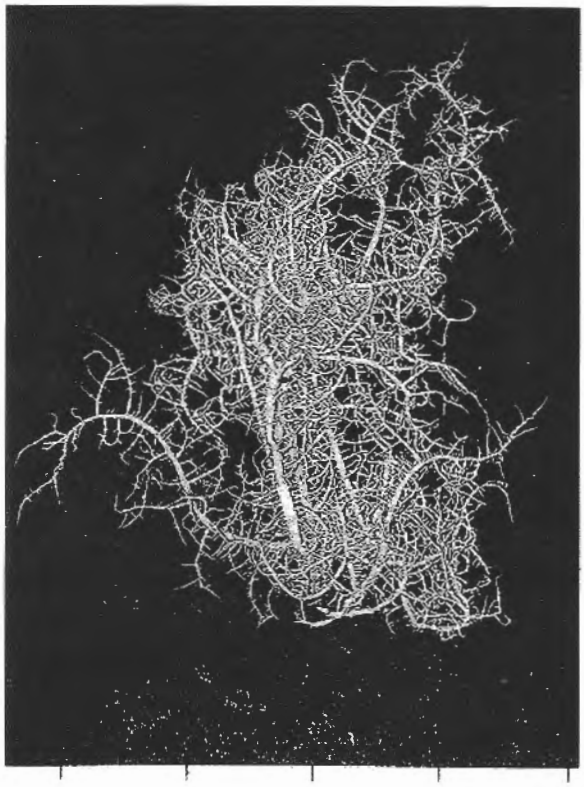

Fig. 33. *U. glabrata 6499c*, habit.
~~~~~~~~~~ = 1 cm.

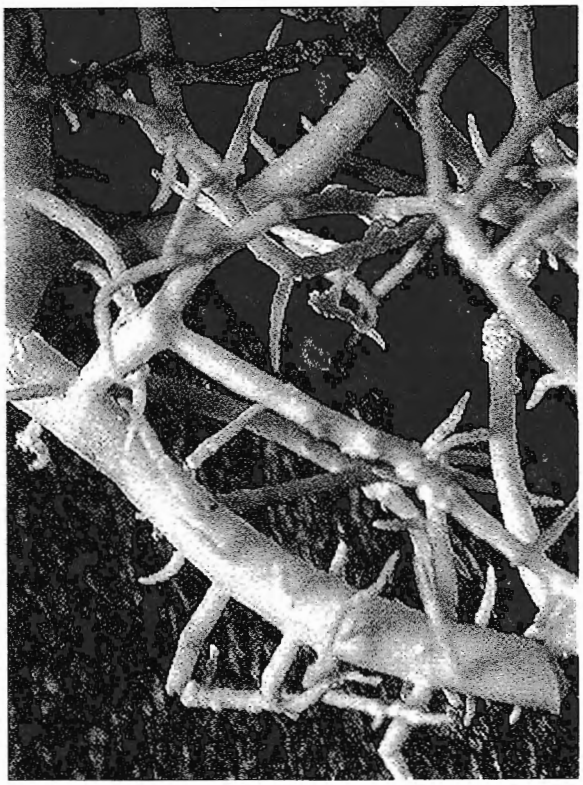

Fig. 34. *U. glabrata 6499c*, soralia, surface.
~~~~~~~~~~ ≈ 1 mm.

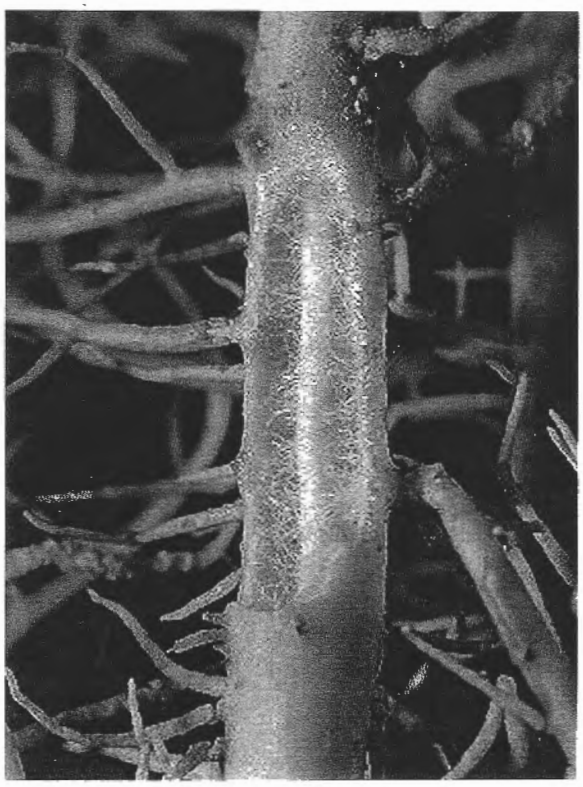

Fig. 35. *U. glabrata 6499c*, CMA.
~~~~~~~~~~ = 0.5 mm.

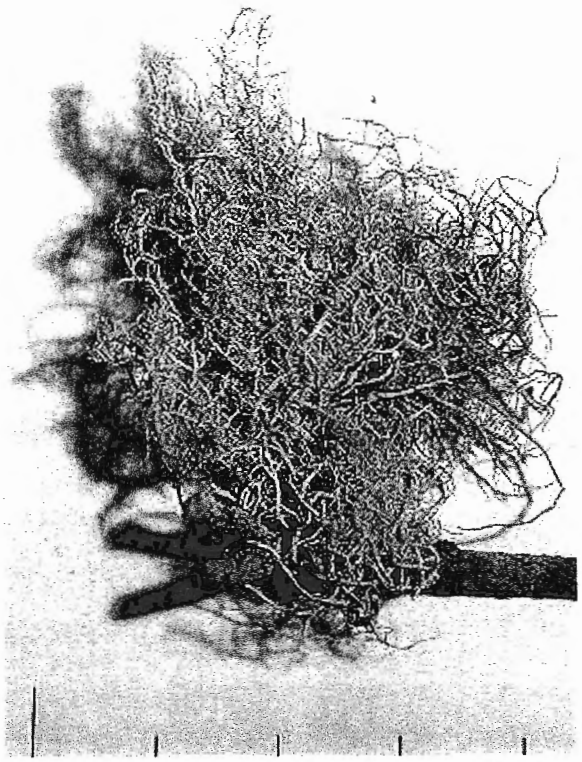

Fig. 36. *U. glabrescens 5715*, habit. Scale divisions = 1 cm.

Fig. 37 *U. glabrescens 5715*, plane to shallowly excavate soralia. ~~~~~~~~~~ ≈ 1 mm.

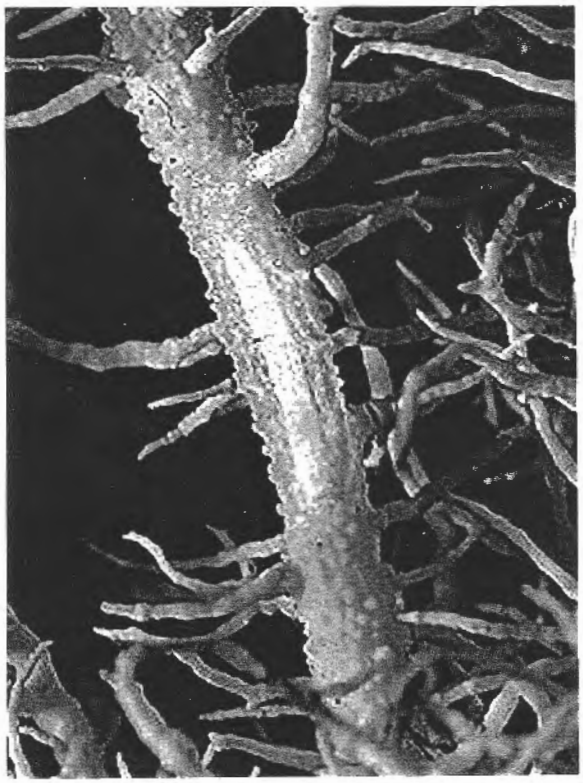

Fig. 38. *U. glabrescens 6615*, CMA. ~~~~~~~~~~ = 0.5 mm.

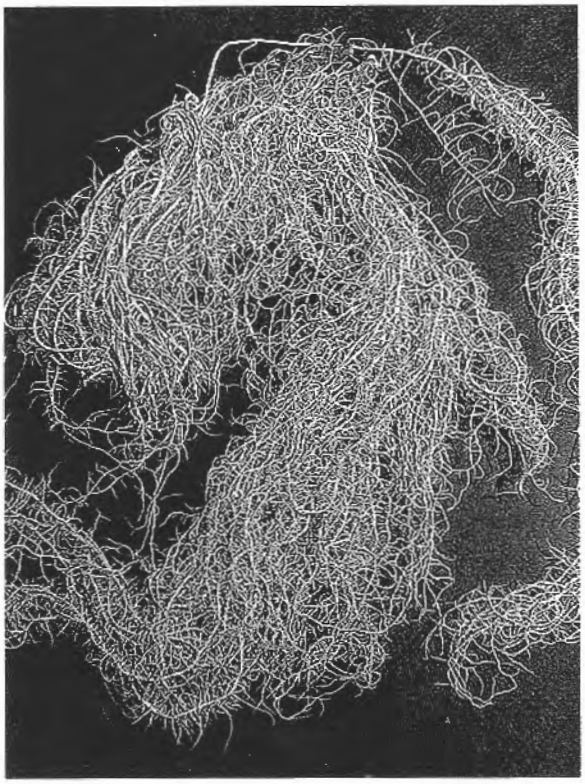

Fig. 39 *U. hesperina 5006*, habit. ~~~~~ = 1 cm.

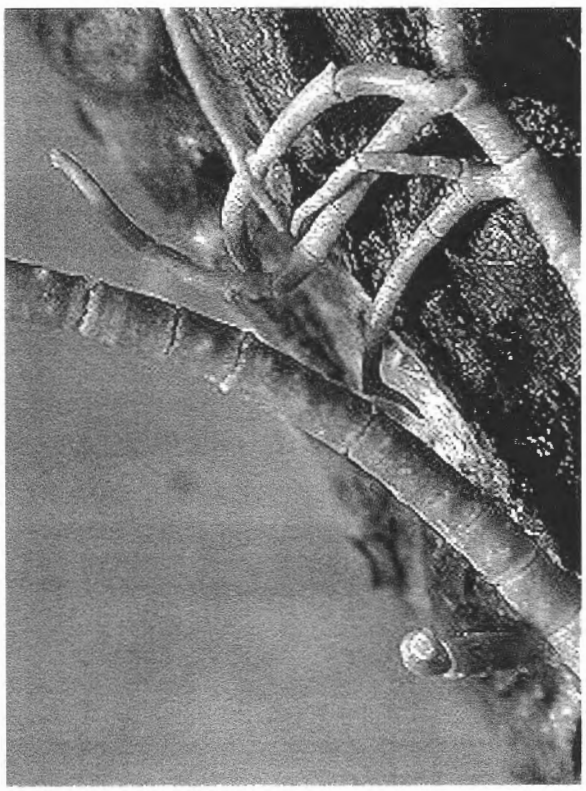

Fig. 40. *U. hesperina 5006*, abundant annular cracks. ——— ≈ 0.5 mm.

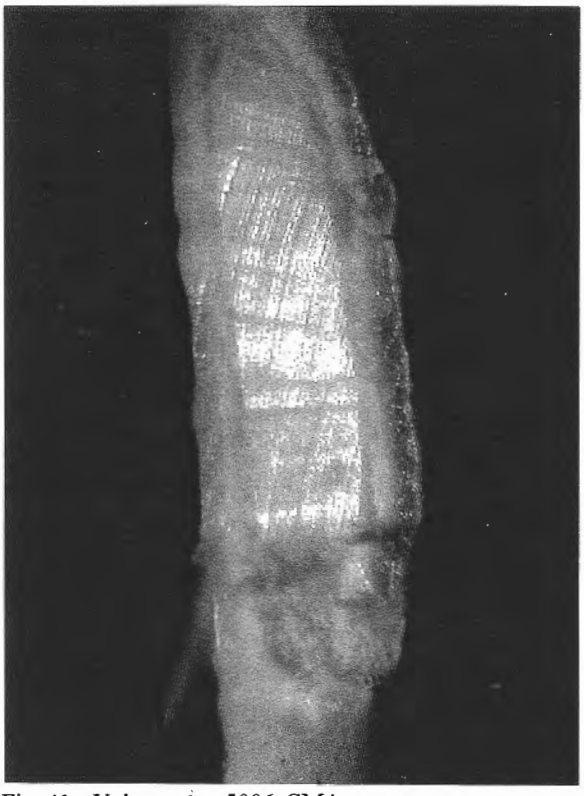

Fig. 41. *U. hesperina 5006*, CMA. ——— = 0.5 mm

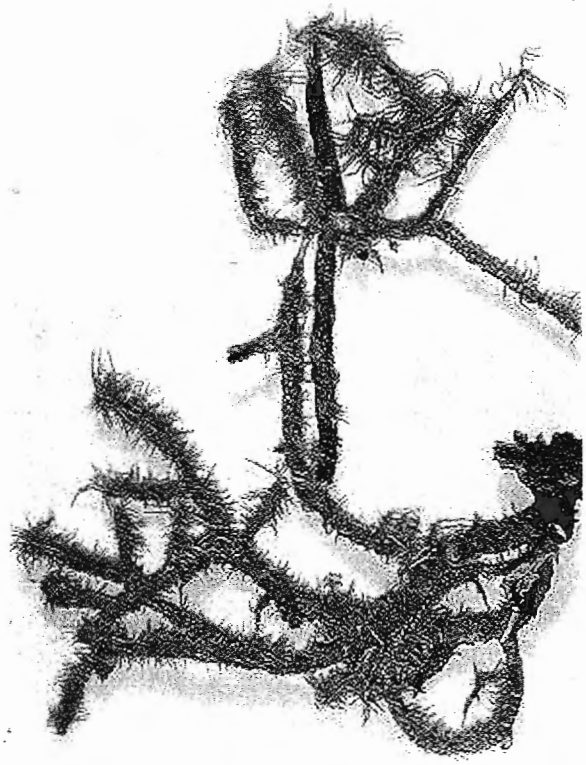

Fig. 42. *U. hirta Becking 99070014*, habit. ——— = 1 cm.

Fig. 43. *U. hirta Becking 99070014*, isidiose, fibrillose surface. ——— ≈ 0.5 mm.

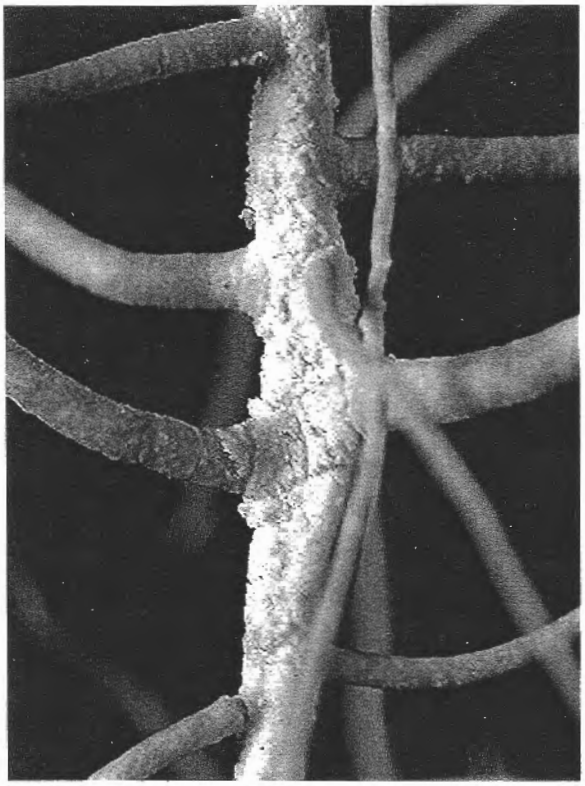

Fig. 44. *U. longissima 6952*, crumbling cortex. ~~~~~~~~~~ ≈ 0.5 mm.

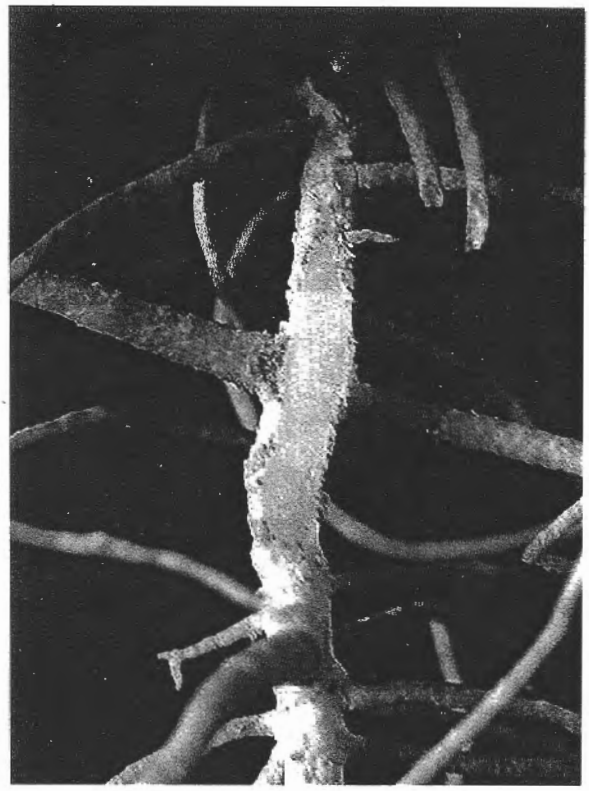

Fig. 45. *U. longissima 6952*, massive axis, poorly differentiated medulla. ~~~~~~~~~~ ≈ 1 mm.

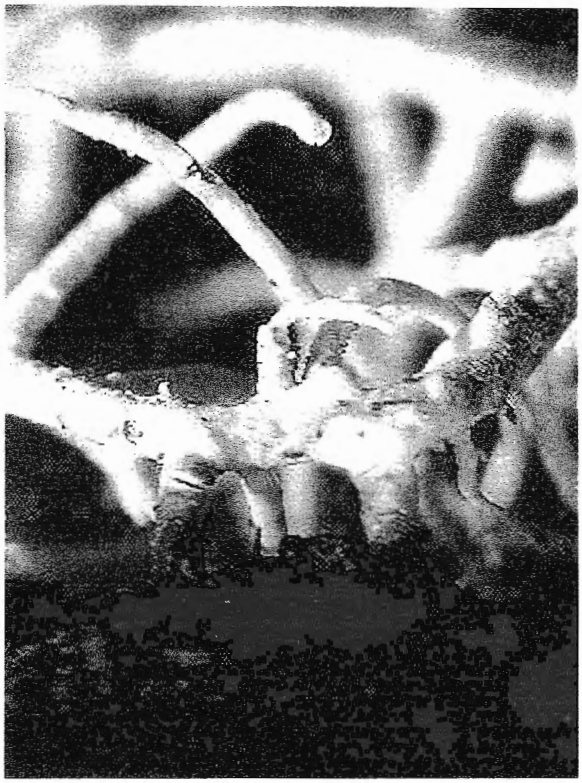

Fig. 46. *U. longissima 6952*, 2 secondary holdfasts. ~~~~~~~~~~ = 1 cm.

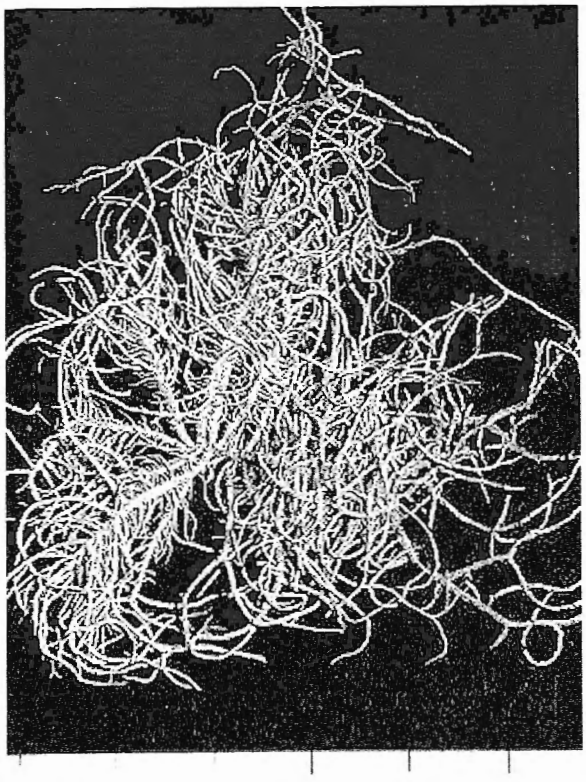

Fig. 47. *U. mutabilis 5714*, habit. Scale division = 1 cm.

Fig. 48. *U. mutabilis 5714*, surface.
~~~~~~~~~~ ≈ 1 mm.

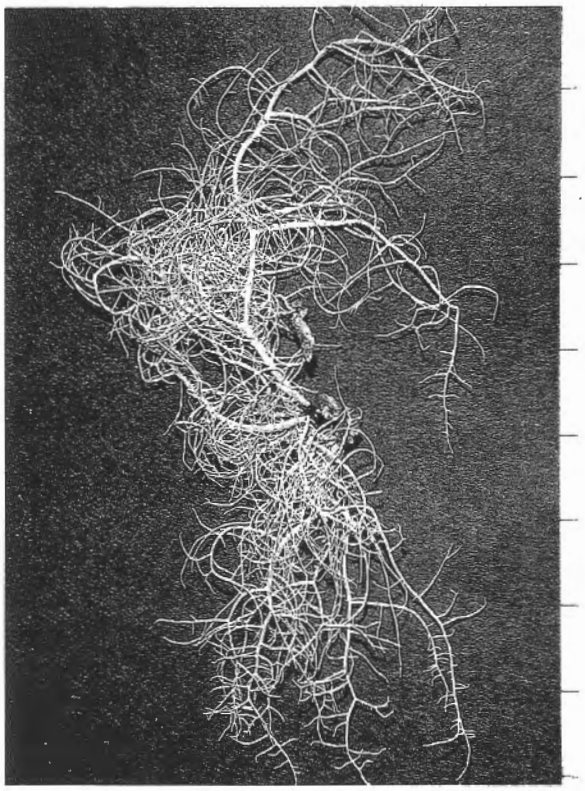

Fig. 49. *U. pacificana 6955*, habit. Scale divisions = 1 cm.

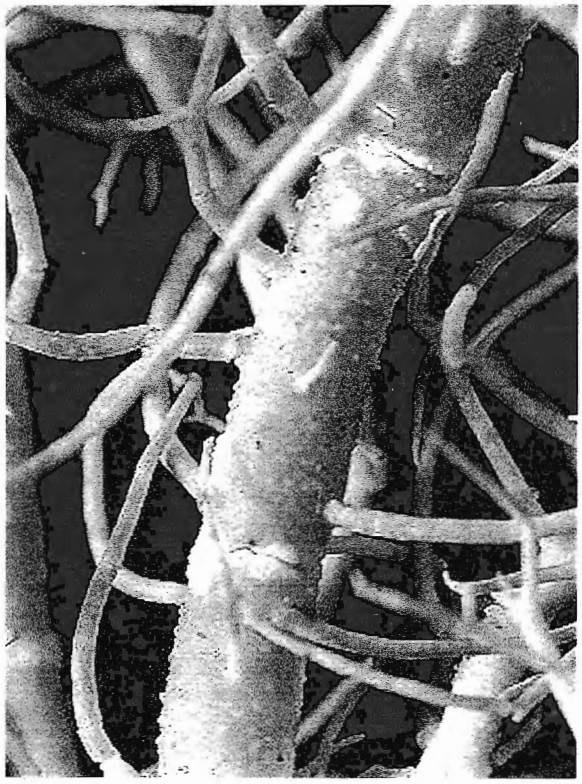

Fig. 50. *U. pacificana 6955*, fibrillose surface.
~~~~~~~~~~ = 0.5 mm.

Fig. 51. *U. pacificana 6955*, CMA.
~~~~~~~~~~ ≈ 0.5 mm.
~~~~~~~~~~

Fig. 52. *U. rubicunda 5407*, CMA, papillae (stictic acid chemotype). ~~~~~~~~~~ = 0.5 mm.

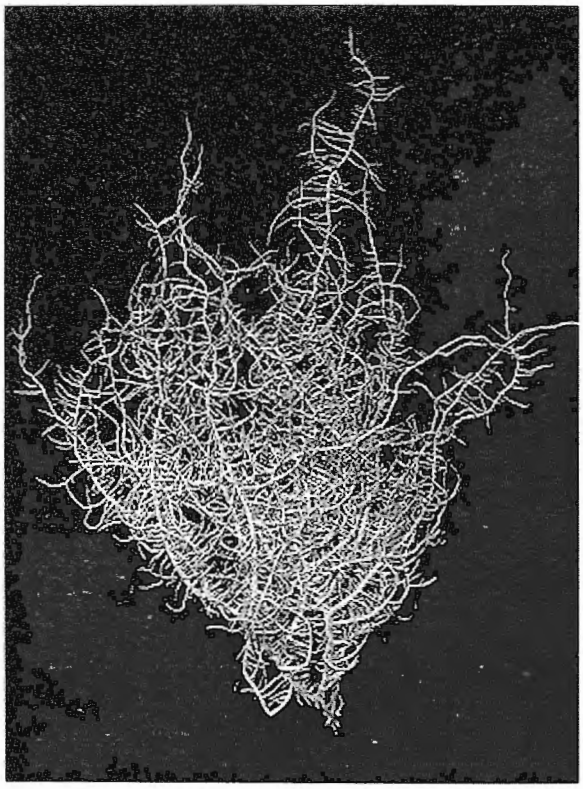

Fig. 53. *U. rubicunda 5393*, habit (salazinic acid chemotype). ~~~~~~~~~~ = 1 cm.

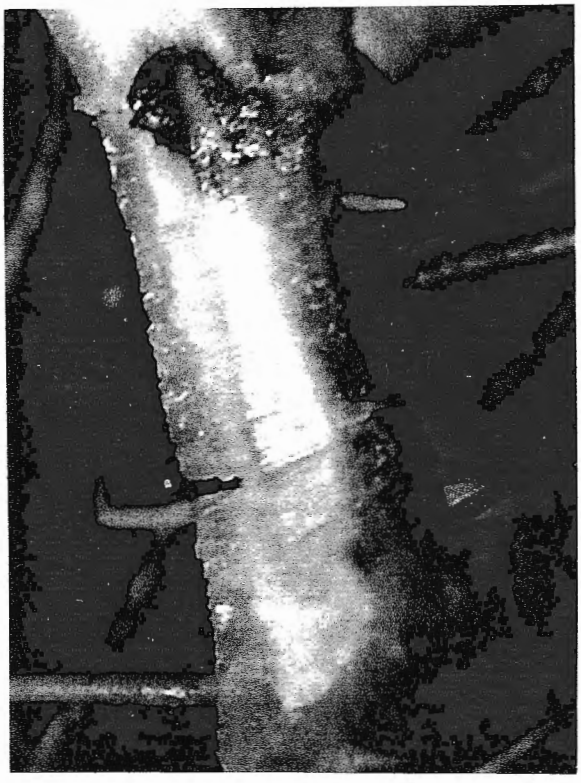

Fig. 54. *U. rubicunda 5393*, CMA (salazinic acid chemotype). ~~~~~~~~~~ = 0.5 mm.

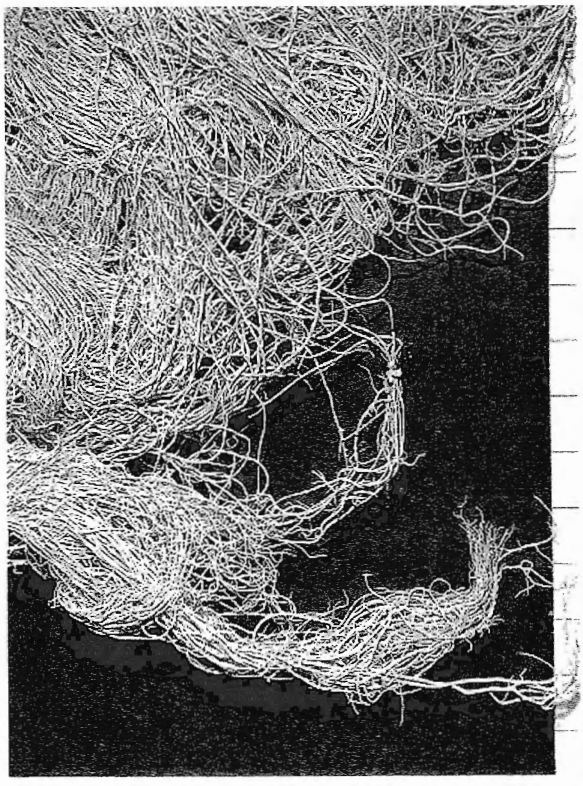

Fig. 55. *U. scabrata s.l. 6567*, habit. Scale divisions = 1 cm.

Fig. 56. *U. scabrata 6567*, shallow, flat bottomed pits in cortex. ~~~~~~~~~~ ≈ 0.5 mm.

Fig. 57. *U. cf. sphacelata R. Ross s.n., 1-19-2001*, habit. ~~~~~~~~~~ = 1 mm.

Fig. 58. *U. cf. sphacelata R. Ross s.n., 1-19-2001*, blackening of branches, soralia. ~~~~~~~~~~ = 1 mm.

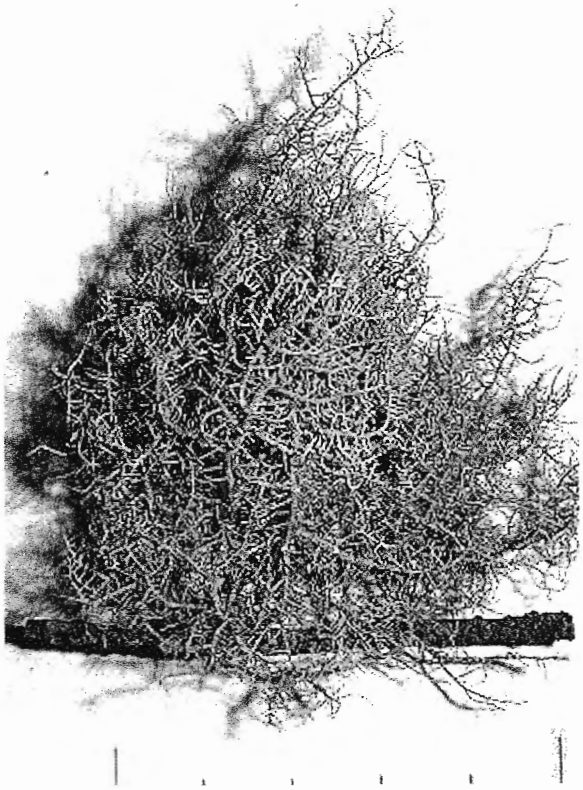

Fig. 59 *U. wirthii 6498*, habit. Scale divisions = 1 cm.

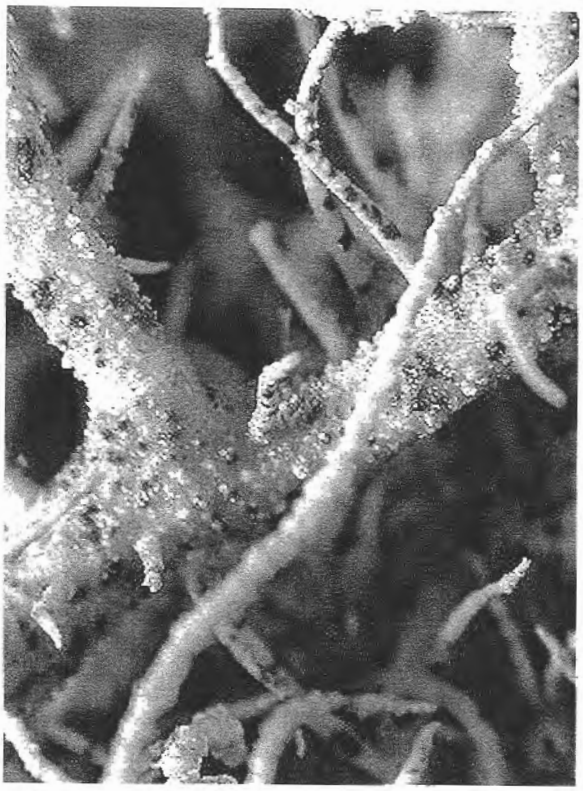

Fig. 60. *U. wirthii 6498*, surface with spots.
~~~~~ ≈ 1 mm.

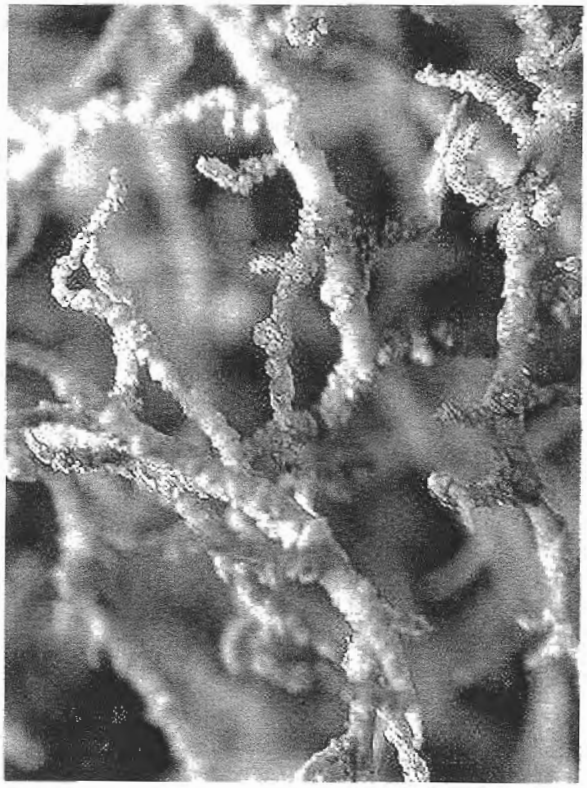

Fig. 61. *U. wirthii 6498*, soralia.
~~~~~~~~~~~~~~~~~~ ≈ 1 mm.

The following thin-layer chromatography was carried out in 3 standard solvent systems at the CALS/Northwest Lichen Guild Conference at Humboldt State University, March, 2001, according to the method of Culberson (Journal of Chromatography 72: 113-125, 1972) with methyl-tertiary butyl ether substituted for ethyl ether in solvent B (Journal of Chromatography 238: 483-487, 1982). Chromatograms were run on Merck silica gel plates with reagent grade solvents and after development were sprayed with 10% H_2SO_4 and heated for 5 minutes at 110° C. A number of taxa not discussed here appear in the chromatograms.

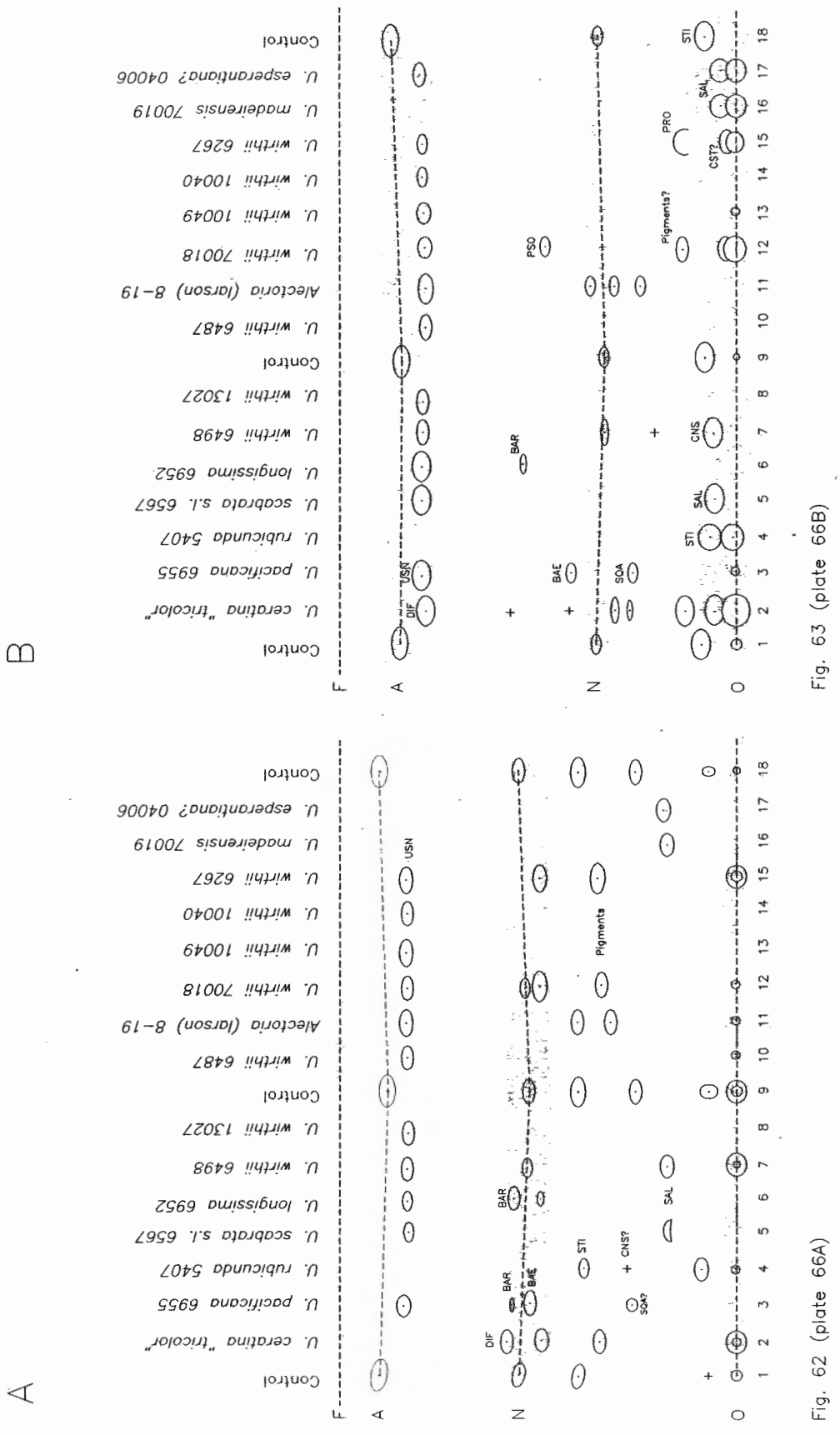

Fig. 62 (plate 66A)

Fig. 63 (plate 66B)

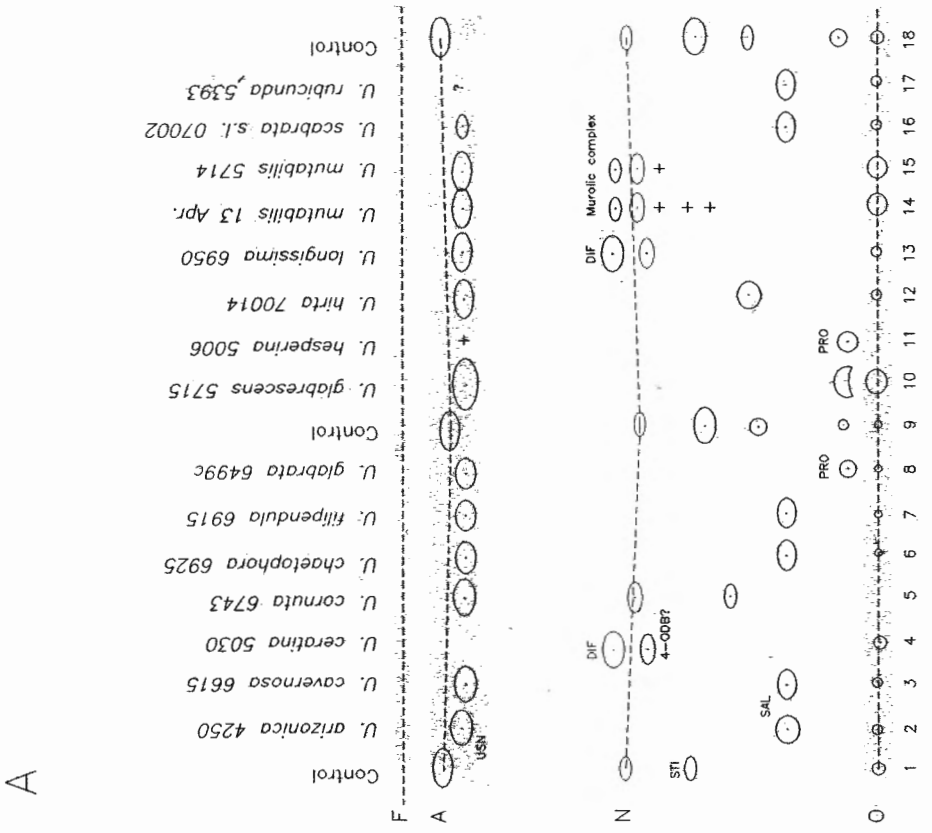

Fig. 65 (plate 67A)

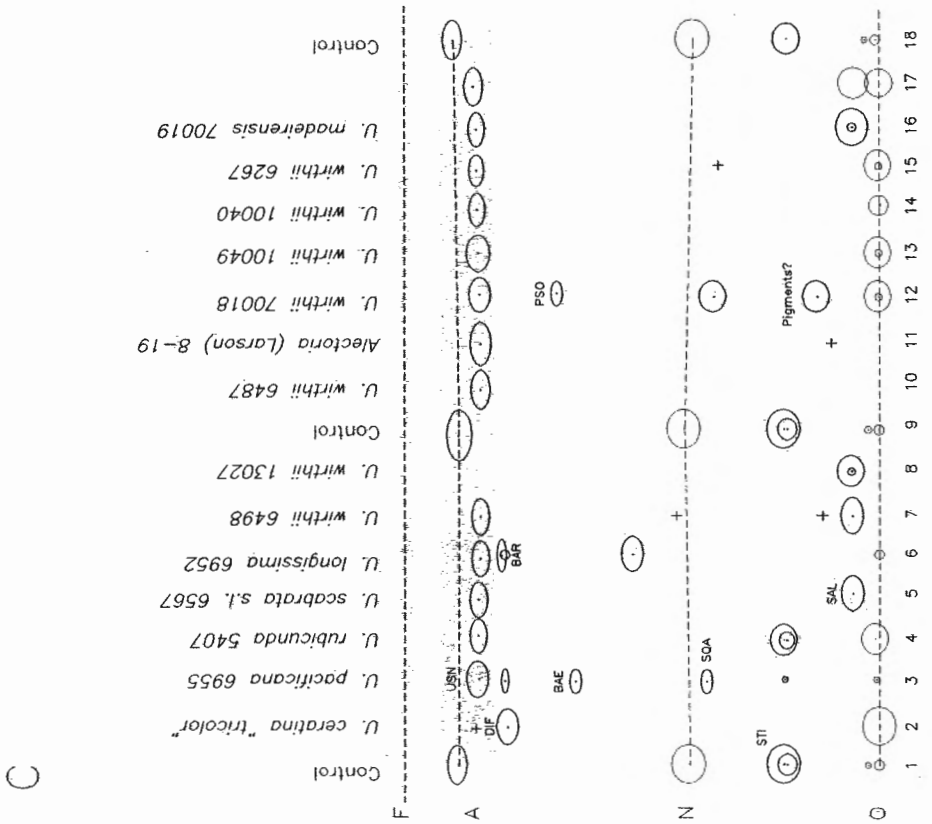

Fig. 64 (plate 66C)

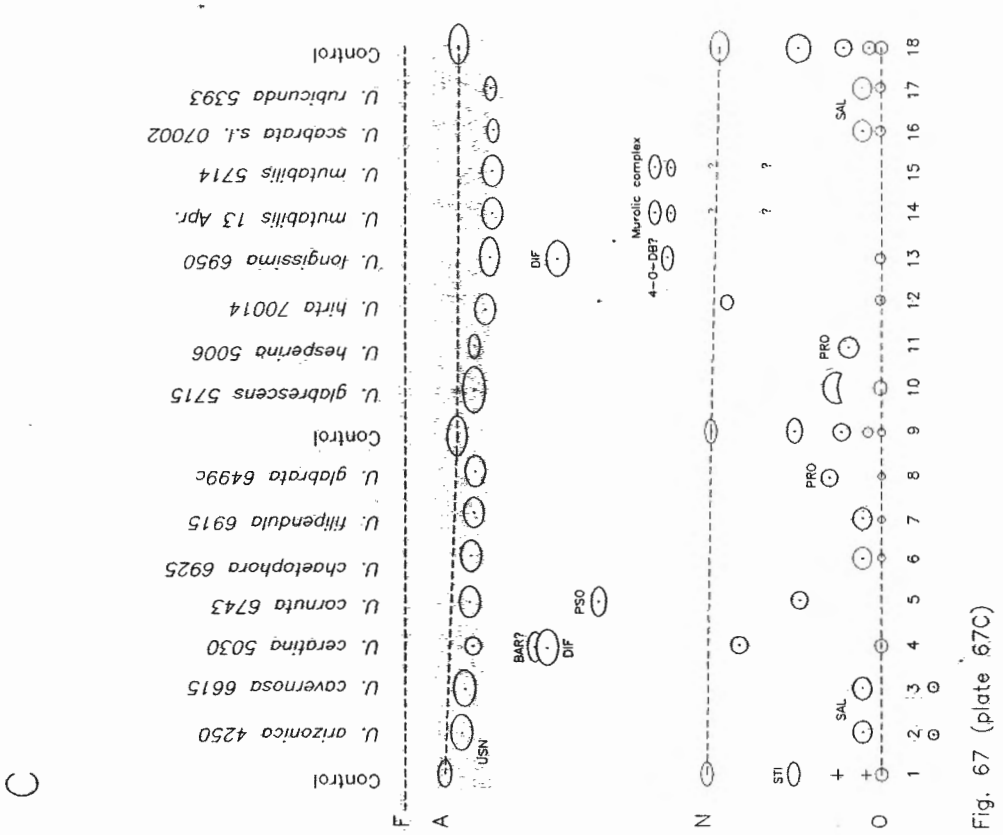

Fig. 67 (plate 67C)

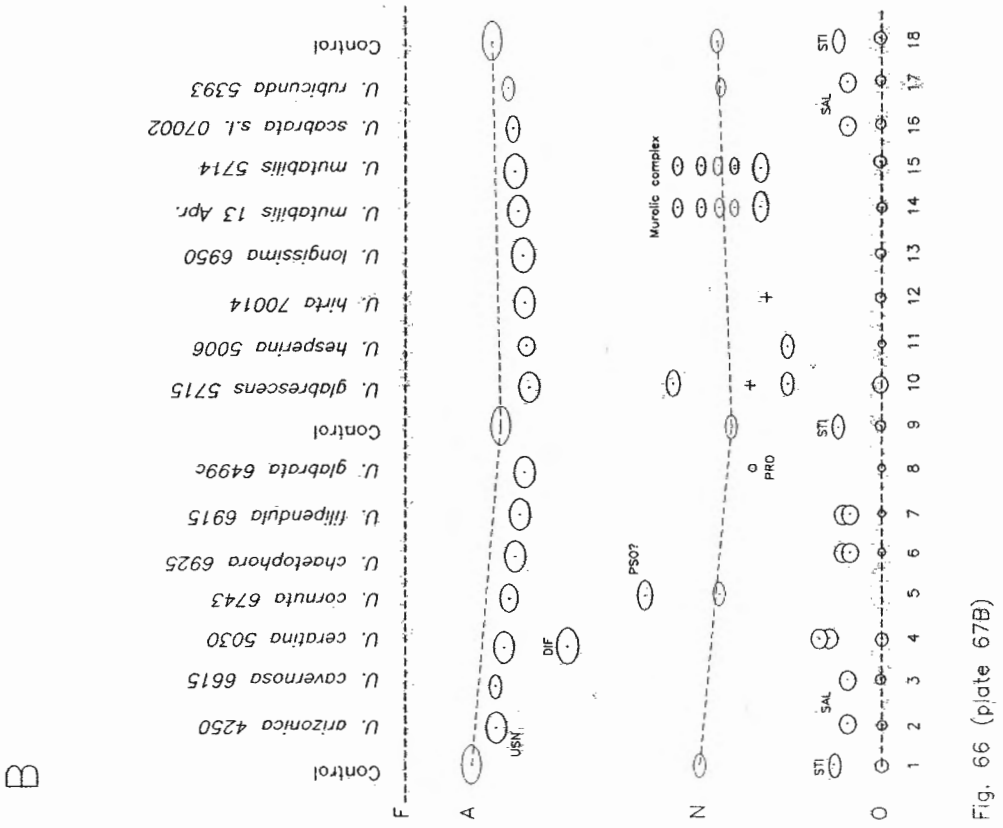

Fig. 66 (plate 67B)

Bulletin of the California Lichen Society 8(1), 2001

Unusual Collections of Macrolichens on Eucalypts

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3 Inyo St., #3
Brisbane, CA 94005.

Eucalyptus globulus Labillardière, the Tasmanian Blue Gum, has a reputation in California as a poor lichen substrate. A number of reasons have been offered, including the deciduous nature of the bark and the contained essential oils. This is a report on a the finding of a rich lichen flora in a grove of *E. globulus* at 335 m elevation on the east slope of Sweeney Ridge, west of San Andreas Lake, in San Bruno, San Mateo Co., CA, with the Pacific Ocean just 9 km west of this seaward ridge. The lichen flora is contained within that of the surrounding coastal scrub and watercourse trees and shrubs.

The area is the northeastern exposure of a coastal bluff. It is significantly more moist than the usual situation in California for a eucalypt grove. The moisture appears to be due to evening, morning, and sometimes daytime fogs, swirling around the ridge from the Pacific Ocean, occurring nearly the year-round. In California, this species of eucalypt has been planted as a windbreak, an ornamental, for essential oil production, and possibly for its ability to dry up low lying marshes that breed insects. (Penfold & Willis 1961; McClatchie 1902). The trees have persistent bark on the lower trunk, and annually shed the bark on the upper trunk and limbs, usually in autumn. Other trees of the same species have only deciduous bark, shed annually (Penfold & Willis, 1961). Some of the same genera and species of lichens are recorded from Tasmanian rain forests, although they are not reported definitely from eucalypts; similar lichens are reported from them, however (e.g.; Kantvilas and Jarman, 1999).

Table 1 shows that a number of macrolichen species with cyanophytes as photobionts are well represented, both on the surrounding shrubs and trees and on the eucalypts. Dryer coastal scrub areas show fewer cyanolichens. This compares well with notes of lichens on eucalypt buttresses in Tasmanian rainforest (Kantvilas and Jarman, 1999). A similar concentration of cyanolichens occurs on *Baccharis* and *Ceanothus* on the "wet side" of San Bruno Mountain, 16 km north (personal observation), which also has localized fog-wet coastal scrub habitat

(McClintock et al, 1990, pp. 8 and 13). The condition of these cyanolichens seems good, and several thalli of *Collema furfuraceum* collected on deciduous bark in May, 2000, proved to be fertile.

In early fall, just before the bark shreds detach, the bark of trees in this grove shows some blackening when compared to bark from nearby, dryer groves. More fungal hyphae were seen in sections of the pendent darkened deciduous bark shreds from these moist Sweeney Ridge eucalypts. This is in agreement with greater "weathering" through bacterial and fungal action in moist conditions.

Many thalli of *Heterodermia leucomelos* and *Usnea wirthii* found on pendent (deciduous) bark were small, and showed more blackening of basal parts than expected. *H. leucomelos* thalli on the mosses on lower trunks were better developed than those on deciduous bark and lacked blackened bases. Basal blackening was also noted in the one small thallus of *Teloschistes flavicans* found, also on pendent deciduous bark. Other lichen thalli on pendent bark also were small. Annual shedding of bark can be considered to limit the size of thalli by limiting the time available for growth. The blackening may be due to an intolerance for the essential oils of the *Eucalyptus*, which have known toxic and antibacterial properties (Thomas 1981; Grieve 1931; Fuller & McClintock 1986). The combination of short duration of the substrate and the toxic nature of the oils may also account for the paucity of crustose thalli on these eucalypts.

I suggest that there is indeed an effect of annual shedding of the bark in reducing the lichen population, which in this grove is overcome by higher moisture levels and adequate indirect sunlight. There is also evidence here of chemical intolerance in the blackening of basal parts of some lichen species, but not of other lichen species. Basal blackening has been seen in these lichens on other trees with well-noted characteristic tannins or aromatic chemical properties, for example, *Quercus agrifolia* and *Umbellularia californica*. The occurrence of this many macrolichens on eucalypts in this location only, of the California eucalypts so far examined by me, is attributed to the very moist, fog laden air and adequate light from the eastern exposure.

Grateful acknowledgement is given to Bill Hill for pointing out this unusual occurrence of lichens on *Eucalyptus* bark;

Table 1. Lichens found on *Eucalyptus globulus* Labillardière, and similar substrates on Sweeney Ridge, San Mateo Co., California, compared with Tasmania.

Lichen Species found on *Eucalyptus globulus*	Cyano-lichen	Deciduous Bark	Persistent Bark	Other	*Baccharis*	*Salix*	Tasmanian Rain For.
Cladonia sp.				Euc.lignin		(n.s.)	gen.
Collema furfuraceum (Arnold) DuRietz	x	x	x		x	x	sp.
Heterodermia leucomelos (L.) Poelt		x	x		x	x	
Hypogymnia sp.				Euc.lignin			
Nephroma laevigatum Ach.	x	x	x		x	x	gen.
Normandina pulchella (Borrer) Nyl.		x	x		x	x	
Pannaria rubiginosa (Ach.) Bory	x	x			(n.s.)	(n.s.)	
Parmotrema chinense (Osbeck) Hale & Ahti		x	x		x	x	sp.
Peltigera collina (Ach.) Schrader	x	x	x		x	x	
Physcia adscendens (Fr.) H. Olivier		x	x	Euc.lignin	x	x	
Pseudocyphellaria crocata (L.) Vainio			x		x	x	sp.
Sticta fuliginosa (Hoffm.) Ach.	x	x	x		x	x	y
S. limbata (Sm.) Ach.	x	x	x		x	x	y
Teloschistes flavicans (Sw.) Norm.		[1]			x	x	
Usnea rubicunda Stirton				Euc.lignin	x	x	
U. wirthii Clerc		x	x		x	x	
Crustose thalli		[1]	[1]		x	x	several sp. on eucalypts

Data on Tasmanian rain forest is limited to one source only, for comparison only, extracted from Kantvilas and Jarmin (1999).
Legend: x=present, ns =not seen but expected, sp.=species present, gen.= genus present, [x] limited numbers, y=similar species found.

to Darrell Wright for confirming the identification of some of these lichens, to Doris Baltzo for identifications of the *Usnea* species, and to her, Bill Hill, Isabelle Tavares, and Shirley Tucker for suggestions that improved this article considerably.

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Errata

In the last issue of the Bulletin (BCALS 7[2], 2000) the following corrections need to be made:

1. In the article by Othmar Breuss and Charis Bratt (Catapyrenioid lichens in California) the caption for figure 1 on p. 43 should read "Upper cortices of a. *Catapyrenium* and b. *Placidium...*".

2. In the article by Darrell Wright (Guide to the macrolichens of California: Part 2) the labeling of the drawings in figure 1 on p. 54 should read "a.) *P. stuppeum*" and "b. *P. chinense*" and the caption should read "Sorediate lobe tips of a.) *Parmotrema stuppeum* and b.) *P. chinense...*".

Lichens by William Purvis

If you are looking for an introductory lichen text written by an internationally known lichenologist, and with illustrations suitable for a coffee table book, you will have found it in William Purvis' book ***Lichens***. A concise description of what lichens are is followed by sections on growth, reproduction, and dispersal methods. Illustrations have been chosen from all over the world, a fair number of them by CALS members Sylvia and Stephen Sharnoff.

Classification in lichens is described clearly but briefly, their ecological role in more detail and with striking images. Next come chapters on lichens in various environments, including extreme ones and how lichens adjust to them. There follow sections on the use of lichens in biomonitoring, prospecting, dating and in commercial enterprises old and new. The final section describes "Practical Projects" and tells the reader how to collect lichens, how to use them for assessing the impact of air pollution, and how to design projects for answering relatively simple questions such as "How fast do lichens grow?" or "What happens when two lichens meet?" Lichens ends with a glossary, index, list of selected references, and useful web links for those wishing more information.

This remarkable book is available from Smithsonian Institute Press, 470 L'Enfant Plaza, Washington, D.C. 20560-0950. It is also available from Borders Books and Music. The price is only around $15.00.

If you ever want to explain to someone why you find lichens interesting (something we all face from time to time), this book will be a real help.

Reviewed by Janet Doell

QUESTIONS AND ANSWERS

Janet Doell
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When lecturing to the general public about lichens, I field certain questions which are of common interest to those attending. Three such questions are answered below. The column is meant to serve people who are new to lichens and do not have easy access to lichen literature.

1. **Question: Are lichens ecologically significant?**

Answer: Some interesting research into that subject has been reported by U. Kuhn et al. at the Max Planck Institute for Chemistry in Germany (see references below). In the early 1990's it was determined that there had to be an as yet unidentified terrestrial sink for carbonyl sulfide (COS) to account for the reduced level of COS concentrations in air masses which originated from boreal regions of central and northern Canada as well as a depletion of COS in air masses in the troposphere over northeastern Siberia. The search for a COS sink led to a detailed study of the exchange of COS between the atmosphere, the soil, and plants; and included two studies of such exchange between lichens and the atmosphere. Field studies were carried out at the Hastings Natural History Reservation in Monterey County where *Ramalina menziesii* grows abundantly and proved to be a suitable subject for this research. Laboratory work was mostly or entirely done in Germany. The results showed that lichens did indeed serve as a significant although not a major sink for COS, comparable to that of higher vegetation when measured on the basis of surface area.

This work adds one more item in our list of ways in which lichens are of ecological significance. Others include the fact that lichens, with cyanobacteria for a photobiont rather than an alga, can fix nitrogen; that is, they make atmospheric nitrogen available to other organisms when the lichen dies and decomposes or is eaten. Lichens help in the weathering of rocks by their acids etching away at the surface, and by the rhizines in foliose species and the fungal threads in the crustose species loosening the rock surface by shrinking and swelling as they are alternately dry and wet. In the desert, soil lichens help hold the sand grains together long enough to enable vascular plants to get established.

Thus the answer to the question is a resounding yes!

2. **Question: What is the quality of life for the alga within the lichen thallus?**

Answer: That is an interesting way of putting it. It is true that the fungus actually parasitizes the alga, but not to the point of killing it. However, the fungus does provide the alga with some protection from UV radiation, the elements, and abrasion. Also, the fungus holds moisture and provides the alga with the moist environment it needs for photosynthesis. The algae found in lichens are rarely found free in nature, so the captured algae are presumably not dreaming of a life of freedom. The alga produces more carbohydrates when part of the lichen symbiosis, than when separate, which could mean that it is more productive because it is happier. But actually the greater production is stimulated by an enzyme secreted by the fungus. Personally, I think that any arrangement which has led to the existence of lichens in all parts of the globe and to their long lives indicates that the "quality of life" for the alga is very good indeed.

3. Question: What lichens are endemic to California?

Answer: Today we have one more lichen species to add to our list of lichens endemic to California: *Aspicilia californica* , thanks to Roger Rosentreter. Our list now stands at:

Aspicilia californica Rosentreter
Bryoria spiralifera Brodo & D. Hawksw.
Edrudia constipans (Nyl.) W.P.Jordan
Lecanora mellea W.A.Weber
Niebla dactilyfera Spjut
N. ramossissima Spjut from the Channel Islands only
Pertusaria lecanina Tuck.
Ramalina puberulenta Riefner & Bowler
Rhizoplaca marginalis (Hasse) W.A.Weber
R.glaucophana (Nyl. Ex Hasse) W.A.Weber
Sulcaria isidiifera Brodo
Vermilacinia tuberculata (Riefner, Bowler, Marsh, T.Nash) Spjut (syn: *Niebla tuberculata* Riefner, Bowler, Marsh, T.Nash)
Verrucaria tavaresiae R.Moe

Anyone else? Please send additions, corrections, comments, to me at doell4@home.com. (Please note change of e-mail address.)

References Cited:

Kuhn, U., A. Wolf, C. Gries, T. H. Nash III, J. Kesselmeier 2000. Field measurements on the exchange of carbonyl sulfide between lichens and the atmosphere. Atmospheric Environment 34 4867-4878.

Kuhn, U. and J. Kesselmeier 2000. Environmental variables controlling the uptake of carbonyl sulfide by lichens. Journal of Geophysical Research , Vol.105, No.D22, pp26,783-26,792.

News and Notes

MINI GUIDE First Year Report:

As we write this note, it is just over one year since receiving copies from the first printing of ***A CALS Mini-Guide to Some Common California Lichens***. Since that time CALS has distributed over 500 copies.

Also it must be roughly two years ago that Greg Jirak first suggested the project (preparing a simple elementary field guide) as a component of CALS' "outreach" program. The basic idea was that although there were various literary sources for the more serious and professional persons interested in California lichens, there was little or nothing for the average hiker and outdoors person who might wish to have an elementary knowledge of California lichens. Further that through such a publication, a few of these persons might become interested enough in lichens to the extent of joining CALS and learning more.

The format of ninety pages, just under three by four inches in size, with alternating color images and black and white text was mostly dictated by the desire to use photos for lichen recognition and to keep production costs as low as possible. Although several images were taken specifically for this project, most were reproduced from our stock files. A prototype version was produced and distributed to several CALS members for review, resulting in many suggestions, corrections, etc., most of which were gratefully incorporated into the final production version.

Currently CALS pays $650 per 100 copies to produce the Mini Guide and sells each for $8.00 (plus postage) to resale outlets, $10.00 (including sales tax) to individuals when purchased directly from CALS members, and $12.00 (including sales tax, shipping and handling) when ordered from us and shipped to individuals. To date, the Mini Guide has been selling itself, mostly at meetings, seminars, field trips, fairs, etc., and with little or no marketing. As regards resale activities, we now have eight outlets, mostly in the San Francisco Bay Area. These outlets have accounted for the distribution of some 160 of the 500 Guides so far, and their share of the sales is currently increasing relatively rapidly.

The Mini Guide is not a huge moneymaker for CALS, but it more than "pays its way" and may, some of us like to think, have been a factor in CALS recently increasing membership.

Richard and Janet Doell

Distributing Mini Guides

Any CALS member sponsoring or taking part in field trips, lectures, or other activities involving lichens, and who would also like to assist in marketing the Mini Guide, may contact Janet Doell at (510) 236-0489 or doell4@home.com for a consignment of copies and directions for reporting sales.

Donors, Sponsors, Benefactors, and Life Memberships

We would like to recognize the following members of CALS who subscribed in 2001 at the Donor, Sponsor, Benefactor or Life Membership level. As an expression of our appreciation, these members will receive a free copy of the CALS Lichen Poster. In addition to a Poster, the CALS Lichen Mini-Guide will be sent to Benefactors and Life Members.

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Lichens of North America by Irwin M. Brodo, Sylvia Duran Sharnoff, and Stephen Sharnoff

The long-awaited book, **Lichens of North America**, will be published this fall (2001) by Yale University Press. It will feature 805 lichen species from the United States and Canada described and illustrated in color, with approximately 500 additional species discussed. It will include 927 color photographs, 821 black and white illustrations and newly compiled range maps for most of the species described. There will be keys, illustrated introductory chapters discussing lichen components and the lichen association; growth forms and special features of lichens; reproduction, physiology, and growth; lichen substrates; lichen chemistry; lichens and ecosystems; biogeography; lichens and people; naming and classifying lichens; collecting and studying lichens; references and further reading.

CALS is pleased to sponsor an 'Afternoon with Stephen Sharnoff', Sunday, November 18 from 2pm to 4pm in the Goethe Room at the California Academy of Sciences, Golden Gate Park, San Francisco. Steve will show slides of his adventures, with his late wife Sylvia, in making the book as well as some of the photos that were left out. The slide presentation will be followed by a book signing by Steve. Bring your book (available at the local bookseller) and join us to celebrate the arrival of ***Lichens of North America***. Refreshments will be served. For more information, photos and links visit Steve's lichen web site at http://www.lichen.com

New *Usnea longissima* site reported

A previously unrecorded site for *Usnea longissima* Ach. has been discovered by CALS members Jerry Cook and Don Brittingham. The location is on the Maillard Redwoods Reserve in Mendocino County. The Pacific Lumber Company of Scotia, California, claims its employees have found many *Usnea longissima* populations on their lands in Humboldt Co. but has thus far failed to provide documentation of them to the California Natural Diversity Database. CALS continues to monitor the

locations of this sensitive lichen species. If you find a new *Usnea longissima* site, please send a small piece as a voucher specimen with the date, geographic location, substrate species, surrounding vegetation and altitude, if available, to Janet Doell or Darrell Wright. See CALS Bulletin Vol. 5 No. 1, p.20.

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Fairs, Meetings, and Fieldtrips

S.F. Mycological Society Mushroom Fair, December 2-3, 2000

Rare and Endangered Lichens was the theme of the display made by Janet and Richard Doell. The Preliminary List of Rare & Endangered Lichens featured in CALS Bulletin Vol. 6 Part 2 was displayed with some of the lichens on the list including *Usnea longissima* Ach. and *Hydrothyria venosa* J.L. Russell. Lichens of various plant communities were also displayed. Bill Hill and Mikki McGee had microscopes set up where participants could see spores, cross sections of lichen thalli, cephalodia and other lichen features Janet and Richard Doell gave their program of lichen slides in the auditorium on Saturday.

Judy Robertson

Sonoma County Mycological Association (SOMA) Mushroom Fair, January 17, 2001

Held in Coddingtown Center, Santa Rosa, where, amidst the many tables of local mushrooms, Judy Robertson placed her display highlighting the many uses of lichens. From food to medicine, decoration to dyes, poisons to perfume, and pollution monitoring to other uses such as bedding and beer making, lichens were displayed in a wheel configuration around the central theme of "The Many Uses of Lichens". CALS has had a display at the SOMA Fair for the last 3 years. We encourage everyone to plan to visit Santa Rosa on the third Sunday of January to see this beautiful display of the local fungi, take advantage of the book, poster and t-shirt sales, and enjoy the CALS lichen exhibit.

Judy Robertson

Sweeney Ridge Field Trip, General Meeting, Pot Luck and Slide Presentation, January 27,2001

This was a beautiful day. Rain had cleared all the smog and dust from the air and the sun was bright. Twelve participants joined Janet Doell for a slow 'lichen-paced' hike on the Sweeney Ridge Trail in Golden Gate National Seashore Park in San Mateo County.

Our first stop was an area of Bishop pine. We found branches covered with *Ramalina farinacea*, *Usnea*, *Parmotrema chinense*, *Punctelia subrudecta*, and *Flavoparmelia caperata*. *Cladonia* species grew on the trunk, with a few *Hypogymnia* thalli. From then on the trail was predominately lined with *Baccharis* shrubs. We began to see *Heterdermia leucomelos*, then an area where *Pannaria* sp. predominated and reaching to the top of the ridge, *Lobaria scrobiculata*, *Pseudocyphellaria crocata*, *Teloschistes flavicans*, *Sticta limbata*. On rocks along the top of the ridge were typical coastal lichens, *Buellia halonia*, *Lecanora pinguis*, *Buellia stellulata*, *Thelomma mammosum*, *Punctelia stictica*, *Parmelia saxatilis*, and *Lecanora rupicola*. A few *Niebla* thalli were even thriving. The highlight of the day was the area around some old battery buildings where *Pseudocyphellaria crocata* made a fine display with *Lobaria scrobiculata*.

Participating were Janet Doell, Judy and Ron Robertson, Lori Hubbart, and Greg Jirak, Bill Ferguson, Debbie Weiss, and David Rusk from the S. F. Mycological Society, Bill Hill, Wendy Dreskin from CNPS, Brian Ali, John Federchek from CNPS and Daniel Jacobs.

At 4 pm we met at SFSU Hensill Hall to prepare for the CALS Annual Meeting and Pot Luck Celebration. Our Annual Meeting covered a variety of topics. The success of the Mini guide was praised. A new ***Guide to the Lichens on California Oaks*** was in the planning. A delicious dinner was enjoyed by all. Then we were treated to a slide presentation by Ron Robertson of the lichens occurring on rocks at Mt. Tamalpais State Park. Ron took us from coast to peak, first showing exactly where he photographed the lichens and then showing us interesting and new finds. This was a great day to officially start the CALS 2001 year.

Judy Robertson

CALS members at the Annual General Meeting. (Judy took the picture.)

Spring Lecture "The Secret Lives of Mushrooms" by Mike Boom, February 21, 2001

What an interesting evening this was! Mike's slides were beautiful! Mike Boom, a past president of the Mycological Society of San Francisco, delighted us with his presentation on mushrooms. His enthusiasm for his subject was evident as he took us through the life cycle of mushrooms, roles of mushrooms in the environment, the anatomy of a mushroom, and finally a tour of California mushrooms.

Mike explained that mushrooms are the fruiting body of a mycelium which is usually hidden underground. The purpose of a mushroom is to drop spores. In the environment mushrooms are saprophytic (decomposers), mycorrhizal (mutually symbiotic with plants), and parasitic. They bind litter, consolidate soil and are food for invertebrates and vertebrates. He explained the types of mushrooms we see:

Gilled mushrooms which are the typical mushrooms with gills which supports the basidium which contains spores

Pored mushrooms like the Boletes

Toothed mushrooms and mushrooms with a variety of shapes from coral mushrooms, stink horns, puff balls to bird's nest fungi.

On his tour of California mushrooms he explained four types: edible, poisonous, hallucinogenic, and other. Mushrooms are used for food, medicine, dyeing, making paper, photography and study.

After the presentation, refreshments were served in the herbarium entry way. Among the participants were CALS members Ron and Judy Robertson, Janet and Richard Doell, Brian Ali, Mikki McGee, and Bill Hill.

Judy Robertson

Stebbins Cold Canyon Reserve Fieldtrip, February 24, 2001

Despite the rain, eleven hardy individuals participated in the Mosses and Lichens Hike at Stebbins Cold Canyon Reserve in Solano County. (The CALS lichen hike at Stebbins scheduled on the same weekend in 2000, was cancelled and rescheduled because of rain.) CALS member and US Forest Service Botanist Cheryl Beyer focused on the identification of the mosses on the Reserve. She had prepared a key to some of the mosses we would see on the trail. As we slowly walked along the creek, Cheryl encouraged us to use the key to identify each moss. She explained the morphology that differentiated genera and species and helped us through each step.

This method of leading a hike helped greatly to familiarize the participants with the morphological characters differentiating genera and species. Even if we did not remember many names we came back with some tools to use to identify mosses in the future. Judy Robertson focused on the lichens present which were wet and harder to identify. The many *Physconia*, *Phaeophyscia* and *Physcia* species appeared green in color. Even the brown *Melanelia* species were green. The crusts were swollen and succulent on the rocks.

We continued on the creek trail until after 1 pm. We ended the hike for lunch at which time the rain stopped. Some of those participating were Ellen Dean, Curator of the UC Davis Herbarium, Glen Hulstein, Bill Hill, Boyd Poulsen, Phil Ward, Cheryl Beyer, Judy and Ron Robertson, and Rob Weiss.

Judy Robertson

California Academy of Sciences Herbarium Tour, March 1, 2001

Mona Bourell, Senior Curatorial Assistant at the California Academy of Sciences, led CALS members on a tour of the herbarium on this rainy March afternoon. The opportunity to observe lichens while standing upright in a climate controlled, poison oak free environment was especially appreciated on this day.

The herbarium is located in the Academy's botany department on the third floor of the Wattis Hall of Human Cultures. Mona began by giving us an overview of the herbarium's history

Inspecting bryophytes at Stebbins Reserve

and its present organization. The original collection, which was the largest and most important in Western North America, was almost destroyed by the 1906 earthquake. The present herbarium dates from 1915, and contains 1.6 million plant specimens. In 1976 the Dudley Herbarium of Stanford University was placed on long-term loan to the Academy, and doubled the size of the collection. Some of these specimens from the Dudley date to 1758. The present collection is a resource of international significance and ranks sixth in size in the United States.

Curators working at the Academy and their areas of interest are: Dr. Frank Almida, who studies the systematics of Melastomataceae primarily in the new world tropics; he is also is working on the revision of ***Marin Flora***; Dr. Tom Daniel, who studies the systematics of Acanthaceae primarily in the new world tropics; he is working on a revision of a flora of San Francisco; Dr. Peter Fritsch studies the systematics of Styracaceae, including temperate and tropical species; Dr. Kim Steiner whose interest is in the

systematics of Scrophulariaceae, focusing on Southern Africa. The Collections Manager is Dr. Bruce Bartholomew, who works with the systematics of Theaceae (Asian) and the flora of China.

The lichen collection contains some 10,000 specimens, many of which were collected by early lichenologist A.W.C.T. Herre. CALS member Mikki McGee is working with Mona to organize the Academy and Dudley lichen collections according to "A Sixth Checklist of the Lichen Forming Fungi of the Continental United States and Canada" by Theodore L. Esslinger and Robert S. Egan (***The Bryologist*** Vol. 98(4): 467-54, 1995. The '7th' checklist has additions and changes to the '6th' and is listed on the web, but is not officially published yet, so the '6th' was used as the reference. Mikki will soon begin to review the identification of the lichens.

Mikki expanded on the contents of the lichen collection after the meeting. "This collection was the Stanford Herbarium collection, and the material there was primarily collected by the faculty and staff, before the herbarium was disbanded. Herre was the principal collector. Although his personal collection was sent to the Field Museum in Chicago, much duplicate material of his own collecting, eschanges, etc. ended up in the herbarium. There is much material from his European and other travels here.

"There is an exchange program going on, but there are no great bulk contributions. It is not 'heavy' with anyone except Herre's secondary collection. Yet it has a number of interesting pockets of collections from Africa, South America (somewhat stronger in the Chilean islands), etc.

"At the present time, Jim Shevock is working on the mosses of the National Parks in the Sierra Nevada, and he has a good eye. He collects much lichen material that is not common, and it is welcome. His material is determined by Bruce Ryan at Arizona State University / Sonoran Desert Project . My "guesstimate" of this contribution is about 2 1/2 to 3 museum boxes, or about 500 - 900 packets. That is what I am guessing, as I have put away about two (lightly packed) boxes since starting, and there were others already there."

CALS members had the opportunity to examine the specimens in the lichen boxes as they wished. Most of the lichen specimens are stored loose (unglued) in standard acid free paper packets. One specimen pulled at random from the shelf was collected by botanist Edward Lee Greene, who worked at the Academy in the early 1880s.
Mona opened several long shelves of color coded files of vascular plants (colors indicate the geographical area where the specimen was collected) and selected several sheets for our inspection. She then took us to the laboratory where dried plant specimens were being mounted and labeled. Mona commented that the Academy herbarium uses Elmer's Glue to fix the dried plants to the paper and has done so for many years. Other herbaria use various other glues. She noted that the type specimens (the specimens on which the original descriptions and names of the plants have been based) are housed in a steel-lined, fire-proof room to protect them from earthquake damage.

Mona recounted the dramatic story of Alice Eastwood's rescue of the type specimens after the 1906 earthquake. Eastwood made her way to the Academy only to find that the marble staircase to the second floor collection was unusable. She climbed to the second floor by holding onto the iron railing and putting her feet between the rungs. Providentially, she had stored the type collections in one place, so that she was able find them quickly, tie them with rope, and lower them to the street below. She managed to get them safely away from the advancing fire.

Mona then took the group to the visitor's room, which contains a microscope and work space. Serious students are welcome to use the herbarium by appointment.

The group gathered in the conference room for refreshments, reminiscences, and discussion. Barbara Lachelt passed around a photograph of a moss which was identified as a *Grimmia* species. Mikki brought in several envelopes of lichens from the collection which were passed around for close observation and comment. We then adjourned into a gray and drizzly dusk.

Those in attendance were Janet Doell, Judy Robertson, Barbara Lachelt, Bill Hill, Mikki McGee, Debbie Gillespie, Leonard Rush, and Elizabeth Rush.

Elizabeth Rush

Spring Lecture "Different Oaks Like Different Folks: A Comparison of Lichens on Deciduous and Non-deciduous Oaks" by Cherie Bratt, March 21,2001

CALS Founding member Cherie Bratt gave this enjoyable presentation about the high school science project of Daniel Lahr. Daniel had approached Cherie with his need for a topic for the science fair. Cherie steered his research to lichens with very interesting results. Daniel's project was to compare the lichen growth on deciduous *Quercus lobata* to that on non-deciduous *Q. agrifolia*.

Daniel selected 6 different sites in the county where a *Q. lobata* and a *Q. agrifolia* of approximately the same size, stood side by side. He collected all of the lichens within reach for a total of 325 specimens. He also took a bark sample at the same location on all 12 trees. Daniel and Cherie worked together on the lichen identification, Daniel concentrating on the foliose and fruticose species while Cherie identified the crustose lichens present. 63 species were identified.

The results showed that the lichens on the deciduous oaks did not closely match those growing on the non-deciduous oaks. Also, the number of lichen species on the *Q. lobata* trees was usually greater than the number on the *Q. agrifolia* trees. Daniel also measured the pH of the bark for both species of oaks. The *Q. agrifolia* pH averaged 6.11 to 5.98 compared to *Q. lobata* which was 7.45-7.58.

Daniel's very professional presentation of his project was awarded First Place in the County Science Fair. In the California State fair his presentation placed second in the plant biology division. He was awarded $500 in prizes and awards. Daniel is now expanding this research for the next Science Fair. He is studying new pairs of trees in new areas and including other oak species in his research.

Cherie encouraged all members of CALS to help in school and science projects such as Daniel's. She stressed that the goal is to learn and do and find a result, even though that result may not be expected. Amateur lichenologists are also encouraged to research the causes of what we see in the field. As we increase information about lichens around us, we are better able to appreciate and preserve them. Watch for an article about this project in ***Evansia***.

Judy Robertson

Northwest Scientific Association Annual Meeting, March 21-24, 2001

This year's meeting was held at Humboldt State University, and featured presentations on forest ecology, botany, wildlife biology and lichenology. It was hard to choose between so many concurrent sessions, and many participants ended up running back and forth between lecture halls, or asking their friends to take notes for them. In addition to an entire morning session on lichenology, some of the forestry presentations also involved lichens.

Lichenology session topics were: habitat modeling for *Lobaria oregana*; estimating epiphytic macrolichen biomass; rare lichens of black cottonwood in Idaho, *Dendriscocaulon intricatulum*, an enigmatic lichen; the genus *Ramalina* in the Kuril Islands; impact of a lichenicolous fungus on the growth of *Lobaria pulmonaria*; using lichens to measure air pollution near archeological resources; artificial hydration of *Lobaria oregana* thalli to measure photochemical efficiency and predict vertical distribution; possible parasitic behavior in *Evernia prunastri*; effects of tree encroachment on terrestrial and saxicolous lichens and bryophytes in native grassland; and taxonomy of *Bryoria spiralifera* and *B. pseudocapillaris*.

These presentations sparked much lively discussion during the sessions and after. Given the combined presence of seasoned lichen expertise, and razor-sharp student minds, the

ideas just flew. How wonderful it was to meet so many young people engrossed in the study of lichens.

The Northwest Lichenologists (NWL) have a tradition of going out to dinner together. Just imagine the exhilarating camaraderie of 37 or so lichen people in one room! With so many kindred spirits, and so much to discuss, it sounded like a veritable rookery.

One highlight of the conference was Darrell Wright's *Usnea* workshop. Darrell had us on the edge of our chairs (or countertops, where many were seated) with his slide show of taxonomic features. At last, *Usnea,* unmasked! We then went into the lab to try keying *Usnea* specimens using Darrell's methods. With his information fresh in our minds, we racked up some successes. Then, again, such close observation only deepened the mystery surrounding some specimens.

Another highlight was the presentation of NWL's Goward Prize for the best student or amateur paper presented at the meeting. This year's award went to none other than CALS member, Doug Glavich, for his research on the genus *Bryoria* at the Lanphere Dunes.

The scheduled field trips to the Lanphere Dunes and Redwood National and State Parks were excellent. We also had an informal field trip to an oak woodland, where we found our quarry – the enigmatic *Dendriscocaulon*! (For further discussion of this conundrum, see ***The Bryologist***, Vol. 104, No. 1, Spring 2001.)

Special mention must be made of the excellent poster session, though few of them featured research on lichens. Most wonderfully, several of the posters showcased research done by high school students, who were on hand to explain and discuss their work.

Steve Sillett of Humboldt State University deserves high praise for hosting the meeting, and coordinating the lichen component. Participants found a wealth of information, in a mileu charged with an exuberant spirit of inquiry. What more could you ask?

Lori Hubbart

Some of the lichenologists gathered at Humboldt State for the NWL Annual Meeting

Daley Ranch Field Trip, April 28-29, 2001

The California Lichen Society had the opportunity to conduct a Baseline Lichen Survey of Daley Ranch. The Ranch is a 3,058 acre conservation area in San Diego County acquired and managed by the City of Escondido. It serves to preserve this biologically unique and diverse habitat of regional importance, and to provide a variety of recreational and educational opportunities for the enjoyment of the community.

Many plant communities make up the preserve, including Englemann and Coast Live Oak woodlands, Diegan Coastal Sage Scrub, Southern Mixed Chaparral, non-native grasslands and riparian areas. Elevations range from 720 to 2,135 feet (220 to 650 m).

At 8 am Saturday morning, 17 people met at the Lake Dixon picnic grounds. After introductions and instructions and the donning of brightly colored 'research vests', we divided into 2 groups to cover as many areas and habitats of the ranch as possible.

Group 1 was headed by long-time CALS member Cherie Bratt, and Group 2 was led by Judy Robertson with James Dillon, a docent of the ranch. The weather was cooperative with a light cover of fog for the morning collecting. At 11:30 we returned to the picnic grounds for a Barbeque lunch hosted by the Friends of Daley Ranch. After lunch we went into the field to collect in different areas. We returned to the picnic grounds at 5pm, then drove to San Marcos State University where Dr. Richard Bray opened his classroom for lichen identification. Cherie brought her microscope and monitor system so we could all see some of the apothecial sections being prepared. Excellent microscopes were available for all participants. The Friends hosted the group to a dinner of pizza and sodas.

On Sunday, we met for a Friends-sponsored breakfast at the Lake Dixon picnic grounds. We formed one group and started at the soil-lichen rich area of Boulder Loop. We followed the east side of the trail, moving down to the Ranch House by early afternoon. From there we took the shuttle bus back to the campground.

The Daley Ranch area can be described as xeric in habitat and the lichen flora reflects this. Although *Cladonia scabriuscula* and *Cladonia chlorophaea* were common covering the soil on banks and under the chaparral shrubs, very few other fruticose species were present. A small number of *Evernia prunastri*, *Usnea*, and *Ramalina farinacea* thalli were identified. The small, orange, fruticose lichen *Teloschistes chrysopthalmus* was found on a few oak twigs.

Foliose species were more abundant and were found on the trunks and branches of the chaparral shrubs, oaks, and on rock outcrops. The yellow *Candelaria concolor* was very common. *Flavoparmelia caperata* and *Flavopunctelia flaventior* were plentiful. More unusual was identification of *Flavopunctelia soredica*, a less common species in our state. Three *Physconia* species: *P. isidiigera*, *P. enteroxantha*, and *P. perisidiosa*, and two *Phaeophyscia* species: *P. cernohorskyi* and *P. hirtella* were common on the oak trunks. *Hyperphyscia adglutinata* cov-

Typical xeric Southern California habitat of Daley Ranch.

vered a large *Quercus agrifolia* trunk at the Ranch house site but was not found elsewhere on the Ranch. *Xanthoria fallax* covered much of an old oak in one area but was seen only rarely throughout the rest of the preserve. *Physcia tribacia* was quite common on the rocks and tree trunks with *Physcia adscendens* much less common. Both isidiate *Xanthoparmelia mexicana* and apotheciate *X. cumberlandia* were common on the rocks. Only one specimen of *X. mougeotii* was identified. The umbilicate lichen *Umbilicaria phaea* was common on the sunny granite outcrops. Conspicuously missing were any *Dermatocarpon* species

Very few gelatinous lichens were present at Daley Ranch. A few thalli of *Collema nigrescens* were found on oak trunks and in one area *Lichenella stipatula* occurred on a sloping rock slab. No *Leptogium* species were seen in the two day foray.

Crustose lichens were outstanding on the rocks. Three species of *Dimelaena* were identified. *D. oreina* was found at only two locations, while the more common *D. radiata* and *D. thysanota* were found in many of the collecting sites. Species of *Acarospora*, *Aspicilia*, *Lecanora* and *Lecidea* covered the granite surfaces. *Acarospora glaucocarpa*, which was not listed by Hasse in his "Lichen Flora of Southern California" and not commonly collected, was found at one site on the Ranch. *Thelomma mammosum* occurred sporadically on the granite outcrops. *Diploschistes scruposus* was common on many of the rocks. *D. muscorum* was found on mosses and *Cladonia* thalli, *D. gypsaceus* on soil and *D. actinostomus* was identified at one site. The chartreuse *Chrysothrix candelaris* was common on chaparral shrubs. An investigation of roadside pebbles revealed *Polysporina simplex*. *Caloplaca chrysophthalma* was identified on a few oak trunks at the Ranch house site . In the lab session, *Phaeographis erumpens* collected on a *Baccharis* twig was identified by CALS member, Les Braun.

Soil lichens were abundant at the Daley Ranch site. They are very important in consolidating the soil surface and preventing erosion. Soil lichens are more susceptible to destruction than any of the other lichens present. Research has shown that simple walking, biking, or horse back riding can easily destroy this fragile crust. Lichens suffer much more damage when the moisture content is low which is the common condition at Daley Ranch (Liddle 1997).

The colorful *Acarospora schleicheri* (yellow thallus with brown apothecia) was common in the soil areas surrounding the flat granite slabs. *Trapeliopsis wallrothii*, *Placidium lacinulatum*, and *Placidium squamulosum* were present with the *Acarospora* squamules. Occasionally encountered were *Endocarpon pusillum*, *Endocarpon subnitescens*, *Psora decipiens* and *Psora pacifica*. Interestingly, some soil lichens occurred in isolated areas of the ranch but within those areas were quite common. One of these was *Peltula patellata* found at only one location investigated but occurring over a large area at that site. A highlight on the Ranch was *Peltula zahlbruckneri* covering large areas on a few of the sloping granite slabs. With the large number of *P. zahlbruckneri* specimens were a few *P. euploca* thalli.

The staff at the Ranch is very diligent in working to keep all users of the area limited to the established paths. In view of the lichen flora this is strongly recommended. Traffic on lichens, especially bicycle tires, can be destructive. The drainage patterns would be altered by haphazard paths dissecting macro and more micro habitats. Lichens represent decades of growth and can be easily destroyed in a much shorter time. The area of Escondido is fortunate to have a reserve to save the natural habitat in this varied and interesting area of San Diego county. Limiting use to established paths will serve the purpose of enjoyment of the area by the public while at the same time preserving it. CALS is fortunate to be a part of this evaluation process. Our inventory is by no means complete. More of the lichens already collected wait to be identified and other species still wait to be collected.

Members of CALS, Docents and Friends of Daley Ranch, Officials and Rangers of the City of Escondido took part in this productive and enjoyable weekend. CALS would like to thank all who planned and participated for their hospitality in welcoming, guiding and hosting our group.

Judy Robertson

Reference Cited
Liddle, M. 1997. Recreation Ecology. Chapman and Hall, London.

Spring Lecture "Lichen Photography" by Richard Doell, May 23, 2001

Richard Doell spoke to members of CALS about special techniques for photographing lichens. Richard is CALS photographer and is responsible for the CALS Mini Lichen Guide.. While the subject is necessarily technical, the lecture, illustrated by his fine prints, was interesting and informative.

As lichens are so small and detailed subjects, rather specialized close up techniques are called for. The more automatic features of the modern camera as often hinder as help the lichen photographer. This work calls for careful and thoughtful readjustment of the camera with special regard to :

aperture for light levels, especially matching the brilliances and darknesses of the subject, and to control depth of field and focus.

shutter speed for light levels and, control of movement.

suitable films for fineness of grain, adequate speed, etc.

reciprocity for allowing the adjustment of one control to compensate for the readjustment of another.

Special attention was given to demonstrating how the photographer needs to overcome the assumptions of the camera manufacturers, in order to get the pictures wanted. CALS is very grateful to Richard Doell for his fine photography, his work with the society, and now for sharing his secrets with us.

Mikki McGee

Editor's note: This lecture was postponed to May because of a schedule conflict on the original April 25 scheduled date – Stephen Sharnoff gave a slide presentation on his lichen photography at the UC Botanical Garden for the California Native Plant Society at that time.

Calaveras Big Trees Park Fieldtrip, June 22 – 24, 2001

CALS members went on a very satisfying fieldtrip to Calaveras Big Trees Park in the Sierra Nevada foothills near Arnold, CA. Hosted by park employees Patty Raggio and (also CALS member) Boyd Poulsen, we staged our excursions from the park's Oak Grove campground. Attending were Ron and Judy Robertson, Rob Weiss, Bill Hill, and Barbara Lachelt.

On Saturday evening, June 23, we had a great picnic dinner at the Jack Knight Memorial Lodge, after which we were duly entertained with a lichen version mock show of "match game" and a program about bears by naturalist Joe VonHerman, followed by a session of identifying many of the specimens found that day in the south part of the park not accessible to the general public.

Then on Sunday Ron, Judy, Rob, and Bill scrambled for hours up the rocks and boulders in granitic outcrops (barely out of the parking lot!) by the Lava Loop Trail - being treated with many new finds - and in the afternoon were awed by the giant sequoias and more lichens at the South Grove. Probably the highlight of the entire trip was observing *Hydrotheria venosa* J. L. Russell, looking like clumps of black gelatinous lettuce waving gently in the currents, locally abundant in small streams safe from upstream pollution and trampling fishermen.

We added a few new species to the original survey done by John Pinelli and William Paul Jordan, and more recently by Boyd and Patty, and are furnishing the park with a more comprehensive collection of voucher specimens.

Bill Hill

Upcoming Events

CALS Fall Workshop Series

September 22, 2001– 'Hands On' Lichen Basics

CALS Founding member, Barbara Lachelt will present this Saturday workshop, 'Hands-On' Lichen Basics. Barbara has developed a 'teaching set' of lichens which she uses to illustrate lichen morphology. We will spend the morning inspecting these samples to become more familiar with the unique morphology of lichens. In the afternoon we will use keys to identify unknown specimens. Help to identify your own lichen specimens will be available by CALS mentors during this time.

The workshop will be held in Duncan Hall at San Jose State University from 10am to 4pm. Duncan Hall is located on San Salvador Street at South 5th Street. It is easily reached by taking the 7th street freeway exit from Hwy 280. Find the campus map on the San Jose State Website:

http://www.sjsu.edu/campusmap/map.html

Bring a lunch. Coffee, tea, and snacks will be available.

Contact Judy Robertson at JKSRR@aol.com or 707-584-8099 for questions.

October 20, 2001 – Introduction to Lichens

Janet Doell, co-author of ***The CALS Mini-Guide to Common California Lichens***, CALS founding member and first President will guide us through an "Introduction to Lichens". Come to learn lichen groups, common lichen genera, and basic morphological features. We will also talk about lichen collecting techniques, preservation, and preparation of herbarium quality specimens.

This workshop will be held in the Conference room at the University Herbarium, 1001 Valley Life Sciences Bldg., UC Berkeley, from 10am to 4 pm. Bring a lunch. Coffee, tea and snacks will be available. Contact Janet at doell4@home.com or 510-236-0489 if you have questions.

SSU Lichen Identification Sessions

Enthusiastic lichenologists have been participating in the twice monthly, evening workshop at Sonoma State University in Cotati. We start at 5 pm. and end at 8:30 pm. We have been bringing our own lichen specimens, using a variety of keys and working with each other to identify our specimens. Snacks are provided and we enjoy conversation about interesting lichen collecting spots, recent finds and future plans.

Jerry Cox and Don Brittingham have been working on lichens they have collected in Mendocino County. Jerry teaches in Ukiah and is compiling a teaching set of lichens for his students. Boyd Poulsen has been identifying lichens of Calaveras State Park. Bill Hill brings his computer expertise with his lichen specimens. Deb Gillespie is learning lichens of Sonoma County. Graduate student Chad Frick is curating his own collection as well as those of the SSU Lichen Herbarium. Dr. Chris Kjeldsen has occasionally joined us.

This is a great opportunity to meet with other lichenologists and enjoy an evening together. We are not always able to identify every specimen, but we leave knowing much more about it than when we came.

Please join us the 2nd and 4th Thursday evenings of every month from 5-8:30pm., Room 201, Darwin Hall, SSU Campus, Cotati. Be prepared to pay $2.50 for parking in the lots. Free parking is available on the street in front of the University, but it is a longer walk to get to Darwin Hall than from the lots. The sessions are not limited to CALS members, so bring any interested persons. If you have questions contact Judy at 707-584-8099 or JKSRR@aol.com.

Upcoming Field Trips

October 5-7, 2001 – James San Jacinto Mountain Reserve, Riverside County

James San Jacinto Mountains Reserve is part of the University of California Reserve System. Located in Riverside County, the Reserve is on an alluvial bench at the lower end of Hall Canyon, a steep, western flank of Black Mountain. In this remote wilderness setting, we will explore habitats of mixed conifer and hardwood forest, montane chaparral, and montane riparian forest for lichens. Collecting will be permitted as we will provide the Reserve with a lichen inventory as well as voucher specimens. There will be dormitory style accommodations, kitchen facilities, showers, and a lab-museum room. The cost will be very reasonable; each overnight stay will be approximately $10 plus meals. If you would like to attend, please contact Judy at JKSRR@aol.com or 707-584-8099. Visit:
http:www.jamesreserve.edu/factoids.html

Look for these field trips in 2002

Pygmy Forest, Mendocino County
Channel Islands, Santa Barbara County
Santa Margarita Ecological Reserve, Riverside County

Other Upcoming Events

August 12-16, 2001 – Botanical Society of America Annual Meeting

The Botanical Society of America (BSA) will hold its annual meeting in Albuquerque, New Mexico. The theme for 2001 is "Plants and People". Besides the BSA, other societies will be participating in Botany 2001 including: the American Bryological and Lichenological Society (ABLS), American Fern Society (AFS), American Society of Plant Taxonomists (ASPT), and the International Organization of Plant Biosystematists (IOPB).

A meeting circular with detailed information about registration, housing, social events, field trips, workshops, tours, and all costs will be available online at the Botany 2001 Website
http://www.botany2001.org

November 18, 2001 – "An Afternoon with Stephen Sharnoff". Slides and book signing to celebrate the publication of *Lichens of North America* by Irwin Brodo, Sylvia Duran Sharnoff, and Stephen Sharnoff

Join us in the Goethe Room of the California Academy of Sciences, Golden Gate Park, San Francisco, from 2 pm to 4 pm. for "An Afternoon with Steve Sharnoff", co-author of ***Lichens of North America***. Steve will show us a slides of his adventures with his late wife, Sylvia, in their making of this long-awaited book. The slide presentation will start at 2 pm, followed by a signing session. Refreshments will be served. Refer to the note earlier in this Bulletin for more information about the book.

December 8-9, 2001 – San Francisco Mycological Society Fungus Fair

The annual SFMS Fungus fair will be held this year at the Oakland Museum (rather than the Hall of Flowers in San Francisco). This two day event features mushroom displays, talks and slide presentations of mushroom forays and sales of books, t-shirts and mushroom "farms". A café of mushroom delights fills the area with delicious smells. CALS will have a lichen display and microscope preparations, always popular with children and adults. A highlight will be a lichen slide presentation by Janet and Richard Doell. We need a CALS member to organize this year's display. Please contact Judy if you are interested in this rewarding job.

February 2002

Look for the Jepson Herbarium Upcoming Workshop: Mosses and Lichens of Southern California led by Dan Norris and Charis Bratt.

For more information call (510) 643-7008 or visit the Jepson Website at:
http://ucjeps.berkeley.edu/jepwkshp.html

President's Message

Lichens, People, and Places

What a rewarding year 2001 has been so far. I am pleased that CALS can offer such a variety of opportunities for members. The Spring Speaker Series was very successful. Mike Boom's enthusiasm in his' Secret Lives of Mushroom' presentation was very evident and his mushroom photos were beautiful.

Cherie Bratt's talk 'Different Oaks Like Different Folks' emphasized that CALS members can be instrumental in encouraging and aiding student projects focusing on lichens. Education of all age groups is so important to bring more public awareness to lichens. I am not a photographer, but Richard Doell's presentation 'How-To's and Whys of Lichen Photography' gave me helpful guidelines to use to take good lichen 'pics'.

CALS has sponsored excellent field trips this year. I especially liked Cheryl Beyer's technique of using a key in the field to identify the mosses at Stebbins Cold Canyon Reserve in Solano Co. It was a pleasure to meet the lichen enthusiasts at Daley Ranch in San Diego County. The Friends of Daley Ranch are very committed to keeping this interesting and diverse area both accessible to the public, yet protected from overuse or misuse. Their helpfulness was very evident as we made our baseline survey of the area. I also enjoyed meeting some of our CALS members from Southern California. The field trip to Calaveras State Park in June was especially enjoyable. I was encouraged that *Hydrothyria venosa* J. L. Russell was growing well in the mountain streams. Also, I was again reminded to expect surprises when exploring for lichens. We covered many areas of the Park, yet found some lichens occurring at only one place. I will always remember to look for something new at each site, a different lichen, a different growth preference, a different substrate. Also important, was the fact that CALS member John Pinelli had completed research on the lichens of Calaveras in the 70's and here we were, 25 years later, able to evaluate the positive and/or negative changes in the area with our survey.

Our March meetings in Arcata with the NWLichenologists at the Northwest Scientific Association Annual meeting was very memorable. To sit in a lecture hall filled with lichenologists was in itself an extraordinary event for me. Meeting others from northern California and the Pacific Northwest, listening to interesting talks by students, amateurs and professionals, working together identifying lichens in the field and in the *Usnea* workshop, sharing meals together – these will always be fond memories.

I also have especially enjoyed the Sonoma State University Lichen ID sessions. What a great time we have had working with one another, solving those hard parts in the keys, and learning and sharing together.

I am proud that our Bulletin is known worldwide, pleased to see the sales of the CALS Miniguide to Common California Lichens keep going up, thankful that so many members have taken Life Memberships in CALS. CALS has so much to offer to each member. I encourage you to join us in our workshops, field trips, and talks. We welcome you to participate by bringing lichens into the classroom, introducing your other membership groups to a 'lichen corner', writing an article for our bulletin, sending interesting lichen finds to our Bulletin editor, helping at the SFMS Fungus Fair this December.

In January 2002 we will be electing new CALS officers for the next two year term. Please consider volunteering. Contact me or any of the officers with your questions. Your involvement is primary in keeping our organization alive, interesting, relevant, and able to meet the needs of future. I hope to hear from you soon.

Judy Robertson

Our Officers and What They Do

Over the years the various functions performed by California Lichen Society officers have evolved. As we will be voting someone into these positions, it is good to know just what we are asking of them! Here is a summary from our perspective to give you an idea of the mechanics of running our Society. Remember however, that our Society itself is a 'work in progress'. That is what is so exciting about being a part of it!

Judy Robertson and Bill Hill

The CALS **Board of Directors** consists of President, Vice President, Secretary, Treasurer and Member-at-large. All members of the Board attend quarterly Board meetings and the annual Membership meetings of the Society. The term of office is 2 years, beginning on January 29 of the election year.

The responsibilities of **President**

1. Oversee the planning, organization and direction of the California Lichen Society.
2. Call and preside at the quarterly Board Meetings and Annual General Meeting.

The responsibilities of **Vice President**

1. Organize the Annual General meeting to be held in January.
2. File the appropriate forms with the Secretary of State and Registry of Charitable Trusts. (January of each year). These forms are filed annually to indicate any change in the Board of Directors for the Society.

The responsibilities of **Secretary**

1. Regarding the membership:
   a. Prepare and send (included in the Winter Bulletin mailing) the yearly membership renewal envelopes.
   b. Keep a current list of the membership of the Society.
   c. Prepare and send letters to delinquent membership (usually in May).
   d. Send to new members a letter of welcome with a copy of the current Bulletin.
   e. Send to the Publications chairperson the list of names of members to receive posters and/or mini guides (Donors and Sponsors).
2. Prepare the minutes of the quarterly Board meetings and annual general membership meetings.
3. Assist in any other mailings as directed by the President.

The responsibilites of **Treasurer**

1. Receive, record and deposit funds for dues sent by members.
2. Receive, record and deposit other funds as received by the Society (books, posters, donations, etc.).
3. Send to the Secretary at intervals the list of the members in good standing.
4. Keep the Society financial accounts (presently in Quicken) up to date.
5. Write checks as needed to pay the expenses and other financial obligations of the Society.
6. File the appropriate forms with the IRS, Franchise Tax Board (CA) and Board of Equalization (Sellers Permit), done annually.
7. Prepare quarterly financial statements for the Board of Directors.

Member at Large

The position will be filled by the CALS Bulletin Editor.

Additional Positions

Events Coordinator

Plan and prepare Society workshops, field trips, and special events.

Publications Chairperson

1. Be in charge of the distribution and sale of our publications such as posters and miniguides.
2. Send to indicated members such publications as instructed by the Secretary or President.

The Bulletin of the California Lichen Society

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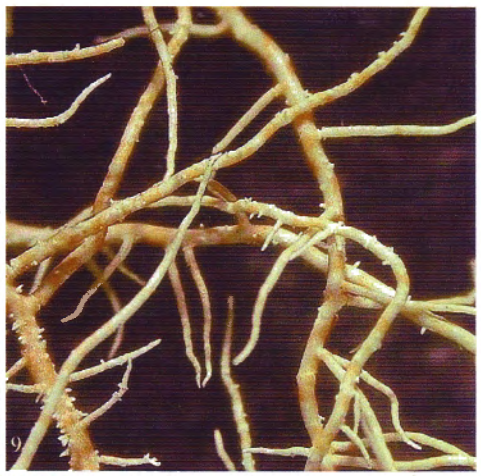
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