

International Lichenological Newsletter

Vol. 2 No. 1

July 1968

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Editor's Note—

Before the next issue of the Newsletter, a review will be made of our mailing list. The review will serve two purposes. First, we will update our address list in anticipation of issuing a revised listing of lichenologists. Second, we will remove from the mailing list names of those individuals who have neither contributed to nor acknowledged the Newsletter, the assumption being that such individuals are either now inactive in lichenological research and/or disinterested in the Newsletter.

Editorial

Biochemical Systematics in Lichens: Another Viewpoint

The last issue of the *Newsletter* contained a discussion of certain aspects of lichen chemical taxonomy by I. M. Lamb, based largely on his work in *Stereocaulon*. No taxonomic criterion has aroused more controversy, but I do not intend to argue here against Dr. Lamb's thesis. Rather, I would like to explore other perspectives of this subject.

The historical development of chemistry in lichen taxonomy is relatively straightforward. Nylander first discovered color tests and described "chemical species" in 1867, but Zopf should probably be credited with the first modern treatment in 1903, using identifiable lichen substances rather than color tests. Because of the magnitude

of his contribution, Y. Asahina must be called the real "father" of biochemical systematics in lichens and for 30 years has followed a reasonably consistent philosophy of recognizing chemical differences as species criteria. *Cladonia* specialists, especially Asahina and Evans, have relied so heavily on chemistry that the taxonomy of the genus is no longer comprehensible without chemical tests.

At present there is a remarkable resurgence of interest in the chemistry of lichen substances, discovery of new compounds, reaffirmation of molecular structures, and biogenetic origins. Although data on biogenesis are still too fragmentary to be of service to taxonomists, nothing discovered so far nullifies or significantly detracts from the taxonomic applications of lichen chemicals.

What contribution has chemistry made to lichen systematics? The most useful aspect is that embodied in the thalline color tests. We have at hand an excellent objective method of identifying specimens. We don't have to measure cell widths or rely on subjective estimates. The simple application of KOH, for example, will separate scraps of *Parmelia caperata* from *P. conspersa*. Is there a lichenologist who would not want to use calcium hypochlorite to separate *Parmelia cetrarioides* and *P. olivetorum*? Or distinguish *Cladonia bacillaris* from *C. macilenta* with a KOH test?

Leaving aside still the problem of "chemical species," one cannot deny that recognition of chemical differences in presumed morphologically identical populations has opened up exciting new areas of lichen study. I presented the first mass sample data on correlations between geography and chemical variation (Hale, 1952), a line of research that has been profitably followed by Culberson (1967) and Runemark (1956) and others. That such populations follow well-defined phytogeographic patterns is extremely interesting in itself. After one works out a pattern from mass samples, as in the *Parmelia plittii* complex (Hale, 1964), one finds it hard to believe that it is really only the chemicals which vary and that the morphological entity is unchanged. The thallus behaves as a passive vehicle for a character that is a highly correlated reflection of geographical variation in lichens. Furthermore, I found in a brief study (Hale, 1966), as had Dahl (1952) earlier in *Cladonia*, that many morphological characters, in particular branching of rhizines, presence of cilia, etc., are strongly correlated with patterns of chemical variation within

groups of species and between genera. A forthcoming index of lichen substances by Chicita Culberson, where data for all genera are summarized, will show this phenomenon even more dramatically.

How should the taxonomic applications of lichen chemistry be evaluated? Separating scraps of closely related but morphologically distinguishable lichens or discovering correlations between morphology and geography is one thing; outright description of new species on the basis of chemistry alone is another. Lamb in 1951 propounded "Chemical strains" as an alternative to the creation of chemical species, a convenient solution but one that does not really get to the heart of the problem. Actually, if one considers the ease with which new chemical species could be described, the record so far is one of responsible restraint. Most described in the last 15 years have been subjected to careful analyses in conjunction with detailed field and herbarium studies. Yet many lichenologists have over-reacted in petty scuffles on whether lichenologist "X" has mutilated the traditional taxonomy of genus "Y" by using chemical characters. I am not going to argue further the propriety of chemical species other than to say that even if they should someday prove to be best considered as synonyms, then we will have paid a small price to gain so much new knowledge on biochemical variation in a plant group.

What is the future of biochemical systematics in lichens? The answer probably lies in TLC (thin-layer chromatography), a new technique that is rapidly supplanting the quaint but archaic crystal tests. Coupled with studies by chemists, the body of information on lichen chemistry is growing faster every year and if present trends continue, routine identification of many lichen species will call for various diagnostic microchemical tests, whether one wants to make them or not. Regardless of problems of nomenclatorial rank, we must continue to analyse the distribution of chemical populations and study correlations of chemistry with morphology and environment. A criterion as exquisite as chemistry simply cannot be ignored. Change is inevitable and eventually the concepts of lichen systematics will come abreast of the facts of lichen chemistry. When that day arrives, perhaps lichenology can claim its rightful place as a prime contributor to the broad field of biochemical systematics.

References

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News

- Ahmadjian, V.** (U.S.A.)—Effective September 1, 1968, will join the University of Massachusetts as Professor of Botany. New address: Department of Botany, University of Massachusetts, Amherst, Mass. 01003. To attend the Second SCAR Symposium on Antarctic Biology at Cambridge, England, July 28-August 6, 1968, and speak on adaptation in terrestrial polar organisms.
- Bailey, R. H.** (England)—Lichen flora of Herefordshire, England; Ecology of *Lepraria incana*; Dispersal of lichen propagules. Preliminary results have indicated that lichen ascospores might be discharged more abundantly at low temperatures. Facilities here do not permit further investigation of this and a small research study might be rewarding. Request any specimens of *Peltigera* or related genera, named or not. Would especially like pairs of similar isidiate/non-isidiate species from localities topographically close to one another.
- Baltzo, D.** (U.S.A.)—Currently working on identification and complete descriptions of the foliose and fruticose lichens of Mt. Diablo, Contra Costa County, California (M.A. thesis). An enumeration

of crustose lichens also will be included. To date, 81 species (31 genera) have been identified. **William Jordan**, another graduate student at San Francisco State College, is working on the bark lichens of the San Francisco Watershed Area, San Mateo County. Another student is interested in marine lichens, in low to high tide areas. Would appreciate any information on Mt. Diablo lichens which has not been published or is not readily available at libraries or in collections. Request reprints on lichenological subjects. Is there a collection of *Pseudocyphellaria anomala* to be seen and is it a valid species?

- Bird, C. D.** (Canada)—Promoted to Associate Professor in July 1967. Co-author of chapters on "The Aspen Parkland" and "The Cypress Hills" in "Alberta--A Natural History," September, 1967. M.Sc. thesis by **R. M. Kalgutkar**, Univ. of Calgary, fall of 1967, "Phytogeography and ecology of the lichens found on *Pinus albicaulis* and *Larix lyallii* in southwestern Alberta." Wish to institute exchanges, especially of western North American material, to add to our herbarium of about 6000 lichen specimens.
- Brightman, F. H.** (England)—Main interest is ecology of lichens. Conducted a course on lichens for adults at Kindropan Field Centre, Blairgowrie, Perthshire, Scotland. Will be running a similar course at Kindropan from August 28-September 4, 1968.
- Clauzade, G.** (France)—Professeur de Lycee agrege de Sciences naturelles detache au Centre National de la Recherche Scientifique (Biologie vegetale). Decouverte de nombreuses especes inconnues dans le Sud de la France, certains nouvelles pour la Science. La flore, notamment la flore lichenique, de la region etudiee etant tres riche, de nombreuses excursions interessantes peuvent y etre faites; et j'ai eu, a plusieurs reprises, l'occasion d'effectuer de telles excursions en compagnie de lichenologues francais et etrangers.
- Follmann, G.** and **Huneck, S.** (Germany)—Phytochemistry and chemotaxonomy of the Ramalinaceae.
- Fox, C.** (U.S.A.)—Awarded a Canadian National Research Council Postdoctoral Fellowship to study at Atlantic Regional Laboratories, Halifax, Nova Scotia, with **W. S. G. Maass**.
- Hale, M. E.** (U.S.A.)—To spend the coming summer at the University of Michigan Biological Station as Investigator in lichens. Plan a brief trip to Israel in September.

- Hawksworth, D. L.** (England)—The lichen floras of Derbyshire, Leicestershire and Shetland, U.K. Taxonomy of *Alectoria*-chemistry of type specimens. Request cultures of mycobionts from *Alectoria* species, duplicates of *Alectoria* specimens for chemical study.
- Johnson, G. T.** (U.S.A.)—On sabbatical leave spring semester of 1968. This time spent visiting various European herbaria, especially those in Geneva, Switzerland.
- Kristinsson, H.** (Iceland)—Presently working on the lichen flora of Iceland at Duke University, U.S.A.
- Lambinon, J.** (Belgium)—Taxonomie et floristique des lichens d'Europe moyenne et meridionale. Etude ecologique et phytocénologique communautes licheniques et bryophytiques. Discussion taxonomique des resultats des investigations chimiques en collaboration avec **J. Ramaut**. Travaux en cours ou projetes: Flore des macrolichens de Belgique et des regions voisines. Etude chorologique et ecologique. Etude de la variabilite en Europe de *Peltigera canina* s.l. Chimiotaxonomie des *Usnea* europeens avec J. Ramaut. Excursion en Tchécoslovaquie en compagnie des lichenologues **A. Vezda, I. Pisut** et **G. Clauzade**, 1966. Exploration lichenologique de l'ouest de la Corse, 1967.
- Lawrence, D. E.** (U.S.A.)—The role of lichens in plant succession and in the accumulation of nitrogen in developing ecosystems. Sabbatical leave 1968-69 to South America, India, Japan, perhaps to New Zealand and Australia. Author of "Plants and Man," a cultural course in botany. Would like to know the detailed geographical distribution (world) of *Cora pavonia*. Has anyone organized this information? Is there anything on the distribution of other Basidiolichens?
- Letrouit, M. A.** (France)—Developpement des apothecies, notamment des elements steriles. Etude en cours: *Parmelia conspersa*. **R. Lallemand** (etudiant): Developpement des ascocarpes du *Peltigera rufescens* (termine) et du *Nephromium resupinatum* (en cours).
- McCullough, H. A.** (U.S.A.)—Working on a lichen flora of Alabama with emphasis on foliose and fruticose forms. Collections are being made and checklists published by physiographic regions. In print thus far are lists for the Piedmont and Valley and Ridge Provinces. Collections are currently being made from the Cumberland Plateau and Highland Rim Regions. Upon the publication of these

- regional studies a more detailed analysis for the entire state will be prepared. Records of Alabama collections will be appreciated.
- Manning, S. A.** (England)—Just published in the Transactions of the Suffolk Naturalists' Society a list of records of Suffolk *Cladonia* which adds a number of species to the county flora. This summer will collect and study *Cladonia* and *Parmelia* in my native county of Norfolk and the county of Suffolk where I work as a teacher of Mathematics, Chemistry and Biology. I will work on the basis of the 100 kilometre squares of the National Grid, feeling that it would be too ambitious at present to work according to the smaller 10 kilometre squares. I would be delighted to loan material from my large personal herbarium to serious workers anywhere if they would send me details of their interests and requirements. Would enjoy visits from lichenologists visiting Britain if they would give plenty of notice (we are 25 miles from Cambridge and about 60 miles from London; a daily coach from London stops at our house).
- Sheard, J.** (England)—Completing a year at the National Museum of Canada working on a revision of the American species of *Rinodina*. I have accepted a position at the University of Saskatchewan in Saskatoon.
- Tucker, S.** (U.S.A.)—From a letter to E. Brodo—"Fink took his private collection with him when he left Minnesota (it is now at the Univ. of Michigan, I believe, with substantial numbers of Fink specimens also at Miami Univ., Oxford, Ohio). But he also left a sizeable lichen collection at Minnesota, apparently the material on which his "Lichens of Minnesota" (Contr. U.S. Nat. Herb. 14, 1910) was based. Most of Fink's packets I noticed were from 1900 and 1901: he had begun collecting in Minn. in 1896, as a student. Fink apparently organized the collection, as the genus folders appear to be labelled in his hand. They remain under the generic names of the day: *Zeora*, *Heterothecium*, *Acolium*, *Biatora*, *Bilimbia*, *Endocarpiscum*, etc. Although Fink's specimens from Minnesota form the majority of the collections of the University lichen herbarium, one also finds numerous European specimens, especially those of Arnold, Stein, and Hepp. Among the exsiccati sets I noticed are those of Cummings, Merrill, Calkins, and Hasse-Plitt. Some of the earlier collectors represented include Brandegee in

Colorado; Foster in Oregon and Washington; Hasse and Herre in California; Langlois in Louisiana; Delamare in St. Pierre & Miquelon, Waghorne in Newfoundland; Cooper in Alaska and Isle Royale. Among the current collectors were John Thomson, Lloyd Spetzman and Eyerdam in Alaska. T. Ahti has annotated some of the brown *Parmeliae* and some *Cladoniae*. But the collection apparently has received little attention from monographers; the specimens retain the names in use around 1900. The specimens are in excellent shape and have received good care, however.

I hope this information will be useful and stimulate greater utilization of the Univ. Minn. lichen herbarium.

Ramaut, J. L. (Belgium)—Techniques d'étude chromatographique (surtout sur couches minces) des substances lichéniques. Discussion taxonomique des résultats des investigations chimiques (en coll. avec J. Lambinon). Mise au point de techniques de séparation de diverses substances. Recoltes en Norvege, 1967.

Rao, D. N. (India)—Growth manifestations of epiphytic lichens in relation to aging of trees and bark characteristics: current project.

Schatz, A. (U.S.A.)—Visits to Europe and Latin America. Received honorary degrees from the University of Espirito Santo in Victoria, Brazil, the Autonomous University of Santo Domingo in the Dominican Republic, and the University of Chile.

Seaward, M. R. (England)—At present co-ordinating an ambitious mapping program for the British Lichen Society and would like to develop international connections so that I may appreciate more fully wider distributional patterns.

Setzer, R. (U.S.A.)—Suggestion concerning the possibility of compiling an overall bibliography of the lichen literature. Being done by Culberson for recent literature; if everyone would send in citations of the literature in their subject area, and keep it current, it would save countless hours of research and provide a much larger picture of the field.

Vezda, A. (Czechoslovakia)—Worldwide monograph of the family Gyalectaceae (incl. *Coenogonium*); monograph study of the genera *Belonia*, *Gongylia*, and *Thelopsis*. Request specimens of Gyalectaceae and the genera just mentioned. I would like to exchange specimens with other lichenologists. Offer: specimens from Czechoslovakia, Yugoslavia, and Bulgaria.

Weber, W. A. (U.S.A.)—Author of "Rocky Mountain Flora" published by the University of Colorado Press in June 1967. Provides keys for the identification of over 1,500 kinds of ferns, conifers, and flowering plants of the southern Rocky Mountains from Pikes Peak to Rocky Mountain National Park and from the plains to the Continental Divide. Supplementing the keys as aids to identification are 346 original drawings.

Wetmore, C. (U.S.A.)—Expanding studies of Heppiaceae into Central and South America. Long-range plans are for a world monograph. Request: Several type specimens are missing from the herbaria where they should be located. I would appreciate information on the location of any authentic material or any specimens in herbaria identified as follows: *Heppia alumnensis* Herre (Type "Alum Rock Park near San Jose, California," collector unknown, perhaps Herre prior to 1913); *H. deserticola* Zahlbr. ("On basaltic boulders," near Tucson, Arizona, collector Blumer, prior to 1909); *H. deserticola* var. *minor* Zahlbr. ("Basalt boulders," Tucson, Arizona, collector Blumer, prior to 1910); *H. planescens* Nyl. ("in Texas supra terram," ex Tuckerman, prior to 1886).

Views

Bailey, R. H. (England)—I feel that the *Newsletter* has a very real place in the present lichenological situation and I look forward, therefore, to receiving future issues. However, I would like to take up one point in your introduction to Vol. 1, No. 1. I do feel that it is desirable that it does not, yet at least, develop into a journal, far less an "information exchange group" type of newsletter. Nonetheless as a newsletter to keep research workers in touch with the activities *but not the results* of other workers, I feel that it could have great value in this time of very rapidly expanding interest and activity in lichenology.

Follmann, G. and **Huneck, S.** (Germany)—*Chiodecton sanguineum* (Swans.) Vain., a widespread tropical corticolous lichen of uncertain position (Ahmadjian, V., Int. Lich. Newslett. 1, no. 3:10. 1967), contains among other specific substances confluentinic acid (Culberson, C. F., Bryol. 69: 312. 1966). The same substance could be

determined now in *Enterographa crassa* (DC.) Fee and its f. *geographica* (Erichs.) Almb., both true *Chiodectonaceae*. Moreover, the thallus structure is largely identical with that of *Chiodecton dilatatum* (Nyl.) Vain., *C. nigrocinctum* Mont., and *C. pterophorum* (Nyl.) Vain., all forming true *chiodectonacean* fruiting bodies. On the other hand, we could not find real clamp connections in any of the four species. In view of this we believe it actually more reasonable to use the older name *Chiodecton sanguineum* (Swans.) Vain. instead of *Herpothallon sanguineum* (Swans.) Tobler.

Huneck, S. and Follmann, G. (Germany)—*Sagenidium molle* Stirt., an extremely skiophytic endemic of the New Zealand and Tasmanian floral regions, has been considered for a long time a form of uncertain systematic position with relationships to the *Roccellaceae*. As the only specific lichen substance we were able to isolate now fuciformic acid from it, a new lichen substance of unknown structure, formerly found only in a chemovariety of *Roccella fuciformis* (L.) DC. (Huneck, S., Mathey, A. and Trotet, G., *Naturforsch.* 22b:1367. 1967). This is a further confirmation that the monotypic genus *Sagenidium* actually belongs to the *Roccellaceae*. But in view of the completely distinct byssinic thallus structure it should not be united with the genus *Roccella* itself as proposed by Zahlbruckner (*Naturl. Pflanz.-fam.* 8: 127. 1926).