

Vol. 2 No. 2

November 1968

# international lichenological newsletter

---

Editor: Vernon Ahmadjian  
University of Massachusetts  
Amherst, Mass. 01003, U.S.A.

Assoc. Editor: Irwin M. Brodo  
National Museum of Canada  
Ottawa 4, Ontario, Canada

---

## Editorial

### *A Physiological Viewpoint*

Until recently, many botanists regarded lichenology as a curious oddity, a subject which was an end in itself, with little relevance or importance to other plants.

Such a view is no longer tenable. In some respects, the study of lichens now occupies a central position in the discussion of certain biological problems. Outstanding among these, of course, is the physiology of symbiosis. At the moment, we know more about the carbohydrate physiology of the lichen symbiosis than of any other symbiotic association between an autotroph and a heterotroph. Further, the behaviour of the mycobionts and phycobionts of lichens is often like that of the algal and fungal components of other symbiotic associations. For example, there are some quite remarkable similarities in the way in which the phycobionts of lichens and the zoochlorellae and zooxanthellae of animals excrete carbohydrates to their heterotrophic partners; in all cases so far investigated (27 species of lichens and 13 species of animals) the carbohydrate excreted in abundance by the alga in symbiosis is absent or nearly absent in cultured or related free-

living algae. As regards the mycobionts, it is now known that the fungi of lichens metabolise the carbohydrates received from the algae in a similar manner to the fungal symbionts of higher plants. Lichens are also important in the study of symbiosis because they are the best material to use for many problems. For example, it is easier to isolate and grow the lichen phycobionts in culture than the majority of algal symbionts of animals. Although lichens may look as if they are difficult experimental material, it is easier to carry out physiological experiments with them than with many other symbiotic associations such as coral reefs or mycorrhizal roots of trees.

An area which will be of great importance in future investigations of lichen physiology will be studies of the effects of repeated wetting and drying. This is for several reasons. Firstly, it will be of great interest to learn what are the characteristics of lichens that enable them to withstand repeated cycles of wetting and drying whereas the majority of other plants cannot (although nearly all of them go through a 'dry' stage such as a seed or a spore). Secondly, it is implicit in the classic studies of Ried (1960) that because a lichen undergoes physiological stress when it soaks up again after being dried out, the frequency of cycles of wetting and drying may be a much more important factor determining lichen distribution than either length of drought or mean rainfall (and if only ecologists could devise some method of measuring this parameter, they might gain a much greater understanding of lichen distribution in the field). Thirdly, some of Ahmadjian's work on the synthesis of lichens suggests that wetting and drying may be an important factor predisposing the symbionts to synthesise.

Ahmadjian's work has also shown that symbionts will only begin to synthesise a lichen in culture under conditions of very low nutrients. In the rich culture media normally used to grow the symbionts, they show no tendency to synthesise—yet nearly all of the studies of the physiology of the isolated symbionts have been carried out under these conditions. Might

it not be much more meaningful to study the physiology of the symbionts in those conditions under which they *will* begin to form a lichen—such as very low nutrients, together with periods of dryness?

There are many problems in the field studies of lichens that cannot be satisfactorily solved until techniques are perfected for the transplantation of thalli from one habitat to another. Brodo (1961) made a breakthrough with corticolous lichens, and now Richardson (1967) has described the controlled transplantation of a saxicolous lichen using resin glue. At last it may become possible to solve some of the thornier and more controversial problems in lichen taxonomy—especially some of those concerning the validity of chemical species. Certainly, what is needed is not just more observations, but more experiments—both on the pathways of synthesis of lichen substances in the thallus, and how these pathways do or do not vary with changes in macro- and micro-habitat.

David C. Smith

### References

- Brodo, I. M. 1961. Transplant experiments with corticolous lichens using a new technique. *Ecology* 42: 838-841.
- Richardson, D. H. S. 1967. The transplantation of the lichen thallus to solve some taxonomic problems in *Xanthoria parietina* (L.) Th. Fr. *Lichenologist* 3: 386-391.
- Ried, A. 1960. Stoffwechsel und Verbreitungsgrenzen von Flechten. II. Wasser- und Assimilationshaushalt, Entquellungs- und Submersionsresistenz von Krustenflechten benachbarter Standorte. *Flora* 149: 345-385.
- Ried, A. 1960. Nachwirkungen der Entquellung auf den Gaswechsel von Krustenflechten. *Biol. Zbl.* 79: 657-678.

## News

**Ahmadjian, V.** (U.S.A.)—Honored at the annual dinner of the Botanical Society of America, held during the American Institute of Biological Sciences meetings at Ohio State University, by being presented the New York Botanical Garden Award for 1968. The award was in the form of a cheque for \$250 and was in recognition of his studies on the lichen symbiosis.

**Becker, B.** (U.S.A.)—Studying experimental associations between an alga and an actinomycete.

**Beschel, R. E.** (Canada)—From April-August, 1968, made the following visits and excursions: Visited herbaria in Helsinki and Turku; excursions with H. Trass and J. Martin in Estonia and with U. Mamatklov in Tadzhikistan; geobotanical field work with V. N. Andreev on the Tscherskii Range, eastern Yakvtia; geobotanical and lichenometrical studies with V. Turmanian on Elbrus glaciers, Caucasus. I found there a growth rate of *Rhizocarpon geographicum* of 33 mm/century on dacite, andesite and granite and discovered, with the dated moraines of 1850 as a base, another glacial advance from the middle of the 18th century.

**Blum, O. B.** (U.S.S.R.)—Studying the relationship of lichens to conditions of aridity and extreme temperatures and importance of these factors for the geographical distribution of lichens. Investigations of the lichen flora of the Extreme Orient, especially the Kuriles (together with A. N. Oxner) are in progress. Studying the family Gyalectaceae of the U.S.S.R. Excursions to Kuriles Islands (Shikotan, Kunashir, Iturup) in 1965 and to Turkmen S.S.R. (SW part of Kopet-Dagh) in 1966.

**Brodo, I. M.** (Canada)—Working on a revision of the North American species of the *Lecanora subfusca* group. I would be glad to examine problem specimens from N.A. north of Mexico.

**Corbett, R. E.** (New Zealand)—Working on the chemical extractives from *Sticta*. Have published three papers on those

from *S. billardierii* and have a fourth in press (Lichens and Fungi, Parts II, III, IV, *J. Chem. Soc.*, 1966 (C) 1566 and 1564; 1967 (C) 1622). Chemical studies in progress on seven other species.

**Fabiszewski, J.** (Poland)—Awarded a Canadian Nat. Research Council Postdoctoral Fellowship for research at the National Museums of Canada (Nat. Sci.) in Ottawa.

**Filosa, R.** (Australia)—Paper in press on the Australian species of *Teloschistes* and *Xanthoria*. Presently working on the lichen flora of the Bass Strait Islands. Interested in the Australian representatives of *Cladia*.

**Follmann, G.** (Germany)—Received a grant from the German Marloth Foundation for lichenological studies, chiefly chemotaxonomic and geobotanical, in the Mediterranean zone—planned for autumn 1968. To visit various herbaria in the U.S.A. to conduct investigations of Antarctic lichens in 1969.

**Gannutz, T. P.** (U.S.A.)—Scientific leader at Palmer Station, Antarctica. He reports that his metabolic studies on lichens are progressing very well due to exceptionally good weather and cooperative electronic equipment. On 16 July 1968 he had successfully completed 170 days of uninterrupted microclimatic, meteorological, and metabolic data collecting. As a result of his investigations, he feels that short-term field and laboratory studies of lichen metabolism have given rise to a number of misconceptions regarding lichen activity. He will return to the U.S. in January 1969, after 12 continuous months at Palmer Station.

**Hale, M. E.** (U.S.A.)—Beginning a revision of Thelotrema-ceae in Southeast Asia.

**Heikkila, H.** (Finland)—Investigating subarctic basidiolichens. Awarded an Institute of International Education grant for one year of study, 1968-69, with V. Ahmadjian at the Univ. of Mass.

**Henssen, A.** (Germany)—Herr Martin Jahns promovierte im Januar dieses Jahres an der Marburger Universität. Das Thema seiner Dissertation lautet: Untersuchungen zur Entwicklungs-

geschichte der Cladoniaceen unter besonderer Berücksichtigung des Podetien-Problems. Seit Februar ist Herr Jahns Assistent bei Professor van den Hoek am pflanzen-systematischen Institut der Universität Groningen, Nederlands.

**Hertel, H.** (Germany)—Working on alpine, saxicolous species of *Lecidea* Ach. em. Th. Fr. in the holarctic, mainly from the Alps. A revision of that part of the genus is a long-range plan.

**Huneck, S. and Follmann, G.** (Germany)—From *Dactylina endochrysea* Lynge, a terricolous endemic Usneaceae from China, we isolated, apart from usnic acid, two new specific lichen substances, dufourein and endochrysin. We request even small quantities of this fruticose lichen, which is generally poorly represented in the lichen herbaria, for an elucidation of its chemical structure.

**Hutchinson, W. A.** (U.S.A.)—Currently working on the ecology and interaction of isolated components of *Stereocaulon*.

**Janex, M. C.** (France)—Développement de périthèces. Étude en cours: plusieurs espèces du *Arthopyrenia*.

**Krog, H.** (Norway)—We have developed a field check sheet for Norwegian macrolichens based on data compiled by Mr. Leif Ryvarden and myself for a checklist of Norwegian lichens. Eilif Dahl and I used the check sheet this summer in the field in northern Norway and it worked excellently. It seems to be the only sensible way of collecting information on the composition of the lichen flora of an area, since one just does not go about collecting all the common species. It also calls attention to the species which unexpectedly are rare or absent in certain areas. When similar check sheets are available from other countries, it would be a good idea if it was announced in the *Newsletter* so visitors to the area might take advantage of it.

**Mattick, F.** (Germany)—Fortsetzung der Sammlung von Material für "Geschichte und Literatur der Lichenologie 1870-1970." Kann ungefähr bis 1973 abgeschlossen werden.

**Nash, T. and Buchauer, M.** (U.S.A.)—Graduate students working under Dr. M. Buell at Rutgers University. Planning research on the effects of air pollution on lichens in eastern Pennsylvania. Nash is concerned mainly with hydrogen fluoride and Mrs. Buchauer with sulfur dioxide, zinc oxide, lead, and cadmium pollution.

**Osorio, H. S.** (Uruguay)—A preliminary checklist of the lichens recorded from Uruguay will be published this year in *Comunicaciones Bot. del Museo de Hist. Nat. de Montevideo*. Recent collections from the region of Nueva Palmira (Dept. of Colonia) in the SW part of Uruguay are under study. Results will be published at the end of the year. Plan field trips to the northern region of the Dept. of Rocha and the central region of Colonia. Will continue to map elements of the tropical flora in southern Uruguay.

**Otto, G. F.** (Canada)—The lichen herbarium of the Univ. of British Columbia includes 5000 specimens, emphasizing collections made in this province. The preliminary checklist of lichens of B.C., issued May 1967, has been widely distributed and is now out of print. I would like to extend established lichen exchange, offering material from B.C.

**Pike, L. H.** (U.S.A.)—Interested in lichen ecology. Currently investigating the role of lichen epiphytes in the cycling of energy and nutrients in forest ecosystems.

**Pyatt, F. B.** (Wales)—For the past two years I have held a Nuffield Research Fellowship to work in association with the Dept. of Social and Occupational Medicine (Welsh Nat. School of Medicine) on part of their major investigation into atmospheric pollution in the steel producing town of Port Talbot (South Wales). Based at the Botany Dept., Cardiff, I am working on the ecology and physiology of lichens in relation to atmospheric pollution. Previous lines of investigation include electron microscopy (in press), dispersal of lichen propagules (in press), and inhibitory phenomena in lichens (in press). My main interests now lie in aspects of

ascospore biology, whole thallus physiology, mineral requirements and elemental accumulation, and lichen pathogens.

**Rondon, Y.** (France)—Étude de la flore et de la végétation lichéniques de la Région méditerranéenne. Recherches sur l'action des extraits de Lichens sur la germination des spermatophytes. Après avoir étudié la flore et la végétation lichéniques de la région méditerranéenne française, j'ai entrepris celle des parties les plus méridionales de la Grèce. Les extraits aqueux des thalles de nombreux Lichens ont une action nettement inhibitrice sur la germination de grains de Blé, à forte concentration, et, une action légèrement stimulante à très faible concentration. En outre, ces extraits provoquent des effets très particuliers au cours de la mitose.

**Seaward, M. R. D.** (England)—The lichen floras of Lincolnshire and the West Riding of Yorkshire, U.K. Urban ecology of saxicolous lichens in the Leeds-Bradford conurbation. Duplicates of *Cetraria* and *Cornicularia* material requested. Accommodation, library, and laboratory facilities available for lichenologists visiting Leeds.

**Shibata, S.** (Japan)—Visiting Professor at the Univ. of British Columbia, Dept. of Chemistry, from April-July, 1968.

**Skye, E.** (Sweden)—Working with Dr. LeBlanc (Ottawa) this summer on the influence of air pollution on nonvascular plants.

**Syers, J. K.** (U.S.A.)—Intending to resume research on the significance of chelation in rock weathering and soil genesis using spectrophotometric, fluorometric, and chromatographic techniques. Would welcome small quantities of pure lichen compounds for studies of their rate and extent of interaction with minerals. Have a limited number of reprints available on the calcium oxalate contents of lichens.

**Takala, K.** (Finland)—Floristic studies and collecting of lichens of Finland. Studying species of lichen symbionts and parasites.

**Topham, P.** (Scotland)—Collecting in N. Jameson Land, Green-

land, Aug. 1967. As an amateur, I mainly collect, identify, and list field material and am always glad when I can pass something on.

**Trass, H.** (Estonian S.S.R.)—The following lichenologists are working at the Dept. of Plant Taxonomy and Ecology of the Tartu State University. We are interested in receiving the next issue of your very valuable *ILN*. I am doing monographical research on the Cladoniaceae and Physciaceae for the manual of the U.S.S.R. lichen flora in 7 volumes (Cladoniaceae-V, 1972, Physciaceae-VI, 1974). Lichen geography, coenology and ecology (geographic elements of the lichen flora of Estonia, classification of lichen-synusia; "city effect"). Lichen flora and synusia of Estonia, Kamczatka and Taimyr peninsulas. Theoretical aspects of lichen systematics. Editor and contributor to "Lichen Flora of Estonia." The following individuals are also contributors: **Piin, T.** Monograph of the Lecideaceae for the U.S.S.R. flora (VII, 1975). Arctic Pertusariaceae and *Ochrolechia*. Request specimens of these taxa. Lichen flora of the Taimyr peninsula. Systematics and identification of sterile crustose lichens. **Sömermaa (Symermaa), A.-L.** Lichen coenology and ecology (epiphytic lichen synusia of the main forest types of Estonia). Statistical methods and application of computer techniques in the study of synusia. Specializes in Caliciaceae. **Nilson, E.** Photochemistry and chemotaxonomy of some genera of the U.S.S.R. lichen flora (*Cetraria*, *Parmelia*, *Pertusaria*, *Ochrolechia*, *Lecidea*). **Martin, J.** Identification of the age of high mountain (Polar-Ural) moraines by lichenometric methods. Lichen coenology (epilithic synusia), and statistical methods. Monographic study of *Rhizocarpon* in the U.S.S.R.

**Vänskä, H.** (Finland)—Ecological studies of saxicolous lichens of northern Karelia.

**Vitikainen, O.** (Finland)—Studies on epiphytic lichen vegetation in Finland: taxonomy of epiphytic *Caloplaca* and *Lecanora subfusca* group.

**Yoshimura, I.** (Japan)—Continuing monograph of *Lobaria*. Request specimens from any area but especially eastern Asia and Siberia. Geographical relationships of *Cladonia* floras in Japan and North America (*J. Hattori Bot. Lab.* 31, in press).

## Notes

### International Botanical Congress

There will be a lichen collecting excursion prior to the meetings in Seattle and we hope for a good turnout. It will be held on the Olympic Peninsula of Washington and include alpine, rain forest, and coastal localities. The trip is being organized and led by J. W. Thomson (Univ. of Wisconsin) aided by I. M. Brodo (Nat. Mus. of Canada). Further details can be found in the Second Circular of the Int. Bot. Congress, which was mailed out in September.

**Non-North American Participants:** Some extremely beautiful lichen-rich country lies just north of the U.S. border in British Columbia. When having passports prepared you should provide for visits to Canada and multiple-entry into the U.S.

## Views

It is clear from the editorials on lichen chemotaxonomy by Lamb and Hale that the *ILN* is indeed an excellent forum for free exchange of views on a number of interesting aspects, and the most exciting of these is lichen chemistry. Biochemical systematics has a definite place in any biological inquiry. At present, it may appear that this field of activity has not made decisive contributions, but the newer trends are encouraging. Recently, a symposium on "Newer Trends in Taxonomy" was held in New Delhi under the auspices of the Nat. Inst. of Sci. of India and the 41 papers presented (Bull. No. 34, 1967-N.I.S. of India, New Delhi), two of them relating to lichens and 13 contributed by scientists abroad, covered a wide range of systematics and illustrated the great variety of scientific

disciplines being employed to study taxonomic relationships of plants and animals. The place of chemistry in lichen taxonomy is complex, but with modern analytical techniques such as TLC and gas chromatography and micromethods of identification of metabolic products, lichenologists should be encouraged. If only classical taxonomists and chemists come together to make new approaches to the problem with mutual understanding, something valuable would be achieved. Chemistry is certainly an exquisite criterion for lichen taxonomy and a change is inevitable.—S. Sankara Subramanian

Having left lichenology in favor of mycology, I will not likely contribute news items to the *Newsletter*, but it is my considered view that (1) the *ILN* should be made available to any institution requesting it, even if it has no lichenologist on its staff at this time; (2) this obtains even more when the institution has one or more important lichenological collections; (3) institutions should expect to pay a certain amount.—R. A. Maas Geesteranus

### Editor's Note:

It is conceivable that increased requests from non-lichenologists for the *Newsletter* will require us to expand our present limited distribution. As for finances, costs of printing supplies and mailing are covered by the National Science Foundation and the Univ. of Massachusetts. Printing is done free of charge. Again, circumstances may change this situation and necessitate our charging a small fee for the *Newsletter*. However, for the present, the policies regarding distribution and financing remain unchanged.

Cover: *Cladonia perforata* Evans drawn by N. Halliday





*Dr. Yasuhiko Asahina, Professor Emeritus of the University of Tokyo, celebrated his 88th birthday on 16 April 1968. He is well known for his significant contributions to lichen taxonomy and chemistry. Currently, he is working on the taxonomy and chemistry of Usnea in southeast Asia and the Pacific region. A jubilee issue of the Journal of Japanese Botany, commemorating his 88th birthday, will be issued this year. (Photograph by S. Kurokawa at a birthday party.)*