Auxin in Mosses:
effects and occurrence*
by Martin Bopp

Since the early nineteen
 fifities it has been well known
that auxin has several effects
on moss development. These in-
clude growth inhibition, inhibi-
tion of bud development, elon-
gation of the young stem and re-
duction of leaf, size and num-
ber (Bopp 1953, Kofler 1959). At
that time it was far from
clear, whether such effects
could be regarded as hormone-
specific or a general regulation or
were merely the manufacture of
a general inhibition of grow-
throughout auxin by high
concentration of auxin used in
the experiments. However, the
subsequent studies by Johri and
co-workers have established be-
ond reasonable doubt that aux-
in is involved in a highly cha-
acteristic manner in the de-
velopment of the protonema
of mosses.

Protonemata of Funaria hy-
grometrica cultivated in Erlen-
meyer flasks in a suspension of
Knop solution without shaking,
remained in the chloronema stage.
With the addition of low con-
centrations of IAA, the protone-
ema differentiate into caulonema
(Johri and Desai 1973). The
strength of this effect depends
on the cell density in the in-
oculum. The lower the original
cell density, the lower the aux-
in concentration necessary. At
cell densities below 0.1 mg pro-
tonema/ml of solution, caulone-
emata appear spontaneously. These
density effects stem from the
release of IAA oxidases from
the protonema which degrades the
IAA in the Knop solution. The
oxidases have the highest activ-
ity in the medium when the cell
density is highest (Sharma et
al. 1979). Thus for caulonemal

BRYOLOGY IN THE DEMOCRATIC PEOPLES REPUBLIC
OF KOREA

By
Siegfried Hunec, Ho Dzon Hoang
and Jong Ho Kim

According to an agreement be-
tween the Academies of the
German Democratic Republic and
the Democratic People's Republic
of Korea (DPRK) one of us (SH)
had the opportunity of spending
one month (September-October
1986) in North Korea in the
"country of the morning calm".
The purpose of the visit was
to give some lectures on phyto-
chemistry at the Institute of
Botany of the Academy of Sci-
ences of the DPRK in Pyongyang
and to meet the bryologists of
this institute, Dr. Hoang and
Dr. Kim. Because so little is
known about bryology in Korea
outside of the country, we de-
cided to write a short article
on this subject for the Bryolo-
logical Times.

The book "Taxonomic list
of plants from Korea. Vol. I."
(Printing House of Sciences and
Encyclopedia, Pyongyang 1983)
lists 187 species of liverworts,
3 species of Anthocerotae and
159 species of mosses. Since
then numerous further species
have been found and now about
220 liverworts and 583 mosses
are known for the territory of
Korea, rather high numbers for
such a small country.

The reason for these high
numbers is that (a) the Korean
peninsula did not suffer from
an ice age like Central Europe,
and (b) the country is up to
90% mountainous. Because of
its position between 34° and
43° North latitude, the climate
is temperate with an average
temperature of 8-12° C and an
average precipitation of 1,120
mm. The Korean flora also has
elements from north-east China,
far-east Siberia and the nor-
thern part of Japan; a small re-
region in the south-eastern part is
subtropical.

Bryotaxonomy in the DPRK
is only done by Dr. Hoang, who
is especially interested in
mosses and Dr. Kim, who works
with liverworts. The herbarium

Footnote: * A contribution to the
Research and Development
column edited by R. Muns and
J.G. Duckett. For addresses,
see Bryol. Times, 31:3.

Figure 1. The summit of Rjongaksan.
of the Institute of Botany of the Academy of Sciences in P’yongyang contains about 10,000 specimens of bryophytes and is very interesting in its exchange of samples. The Korean scientists would also be very grateful to colleagues in other countries for providing them with a dictionary or other modern literature on bryophytes.

A monograph about the bryophyta, including the bryophytes, is in press and a volume containing the capital. From Closing as part of the "Flora Corinnae." Furthermore, lists of bryophytes of special localities (Mt. Paekdusan, Mt. Kumgangsan, Chilbong and Chilbosan) have been published in the journals "Saegukphyta" (Biology) and "Manikagwon Tongbo" (Bulletin of the Academy of Sciences of the DPRK) during the last few years. These journals are issued by the Science and Encyclopaedia Publishing House in P’yongyang and are written in English summaries and English lists of contents, respectively.

It was a great pleasure for one of us (SH) to take part in the excursions in the countryside, with Dr. Hoang and the Head of the Department of Natural Products of the Botanical Institute, Dr. Puk-O. The first excursion took us to Mt. Rjongak, about 15 km north of the capital. From the summit of this mountain (Fig. 1), we had an excellent view of the golden-yellow ripe rice fields below and P’yongyang in the distance.

Another excursion took us to Kaesong, 200 km south of P’yongyang, the former capital of the "Koryo Kingdom". Kaesong is well known for the cultivation of ginseng (Panax quinquefolia) the roots of which yield a famous "tonic." Near Bakjon, about 20 km northeast of Kaesong, we collected Jamesonitria autumnalis, Naevicaria ulophylla, Lophocolea minor, Porella vernicosata, P. grandiloba, P. duncana, P. tanacisci, and P. tetradenisia. A further highlight was the visit to Mt. Myohyang, about 200 km north of P’yongyang, where we stayed for 3 days. The Myohyangsan (san=mountain) is of granite and in the very steep and narrow valleys small rivers run down over numerous beautiful waterfalls. The slopes of the mountains are covered by species-rich mixed forests and especially the moist, north-exposed sides of the valleys are very rich in bryophytes. On soil below the paths grew Marchantia polymorpha, Pellia endiviaefolia, P. neesiana, the pale green Eriocaulon japonicum and C. conicum, the latter differing distinctly in its smell from European plants. The granite boulders were covered with Jungermannia subulata, Porella setigera, Lejeunea japonica, and on the bark of deciduous trees grew Frullania mesotaenia. The sunny rocks were covered with Grimmia speciosa and Hedwigia ciliata. On soil and rotten trunks we found Dichocarpum japonicum, Attichium undulatum, and Fagonia inflata, while on coniferous trees above 1,000 m Leucolepadium pendulum and Neckera penzata were frequent.

On the way to the highest mountain of Myohyangsan, Mt. Bobjingham (1,350 m a.s.l.) we arrived after 4 strenuous hours at the small Buddhist temple Nunjinam (1,000 m a.s.l.) from where we had a marvellous view down to the forests which were in full autumn colour; especially Acer pseudo-siegoldianum was shining a deep red colour. Immediately above us was the summit of Mt. Bobjingham with nearly vertical slopes. Unfortunately we could not climb to the summit because we had lost too much time collecting plants. After a nice picnic at this memorable place we went downwards, which proved to be as difficult as the way up.

One of us (SH) thanks the Academies of Sciences of the FDR and the DPRK for funding the journey to Korea and for organizing the excursions. He is especially grateful to Drs. D. and Hoang for their guidance and continuous help. Last but not least we thank Dr. R. Grosle, Dr. S. Hattori and Dr. M. Mizutani for identifying the collected liverworts.

S. Huneck, Institute of Plant Biochemistry of the Academy of Sciences of the GDR, Halle/Saale, Weinberg, 4050, DDR.
H. D. Hoang and J. J. Kim, Institute of Botany of the Academy of Sciences and the DPRK, P’yongyang, DPRK.

THE FOLLOWING LIST for the period 16th February 1987 - 30th May 1987, updates those already published. The last list appeared in BRYOL TIMES, 426:

**New Members**

- Bates, J. W. Imperial College at Silwood Park, Ascot, Berkshire, SL5 7PY, England, U.K.
- Becker, Hans. Fachrichtung 15.1 Universität des Saarlandes, 66 Saarbrücken, Germany B.R.D.
- Bisang, Irene. Systematisch-Geobotanisches Institut der Universität und Botanischer Garten, Altenberg 21, CH-5031 Bern, Switzerland.
- Kack, Cynthia. Botany Department, University of Iowa, Iowa City, IA 52242 U.S.A.
- Lisgrone, Roberto. Technische Hochschule, Institut f. Botanik, FB Biologie, 10 Schmittsstrasse, D-6100 Darmstadt, Germany, B.R.D.

**Change of Address**

- Hatta, Satish C. Department of Botany, University of Delhi, Delhi 110 007, India.
- Hattaway, Robert A. Northeastern Illinois University, 55-200 N. St. Louis Avenue, Chicago, Illinois 60625-4699 U.S.A.
- Schäffer-Verwimp, Alfons. Rue Frederico Guarino, 520, 05-713 São Paulo, Brazil.
- Timme, Steve L. Department of Biology, F.O. Box 5284, University of North Alabama, Florence, AL 35632-0001, U.S.A.

**BRIOLOGICAL BOOK OF RECORDS**

More on Mosses and Stamps

by S. W. Greene

Unfortunately due to the amount of photo reduction the identify of the moss on the stamps illustrated in Bryol. Times, 426 was hardly legible. They were Sphagnum palustre (left-hand stamp) and Amblystegium serpens (right-hand stamp).
COURSES AT HELSINKI

GRADUATE AND UNDERGRADUATE students in botany in more than 80 colleges and universities in 27 states of the U.S.A. have an unusual opportunity for a study year abroad. The University of Helsinki is affiliated with the ISEP exchange program under which one student may study in a foreign university at fees similar to those he or she would pay in his or her home institution. The Botany Department of Helsinki offers a variety of courses in bryophytes: Sphagnum (Dr. P. Hynynen) and liverworts (Dr. S. Pilipko). This program is supported by one of the finest herbaria in the world, and there is a large and active cadre of graduate and undergraduate students in that specialty (see Bryol. Times 43: 1-4. Similarly the lichenology program includes a course taught by Prof. T. Ahti; there is available one of the premier lichen herbaria and a large and active group of students. Research in both these subjects is encouraged, with ample space and equipment provided.

As an American who has spent over two years in the bryophyte herbarium at Helsinki, I can testify that these programs are among the best that I have seen. English is adequate as a language for nearly all communication, and the courses are so laboratory-oriented that an English speaking person can prosper. I strongly recommend that students, interested in bryophytes and lichens, consider studying in Helsinki under the International Student Exchange Program, 1242 35th St. N.W., Washington, D.C. 20057. - Daniel H. Norris, Botanical Museum, University of Helsinki, Unioninkatu 44, SF-00170 Helsinki 17, Finland.

ADDRESS
LISTS AVAILABLE
IN ADDITION TO THE SOFTWARE-SERVICE (Bryol. Times, 42:5-6), the address files of bryologists and bryological herbaria of the world, compiled by D. H. Vitt for the "Compendium of Bryology" (1985), and offered on disks for Apple II, is now available also for IBM and compatibles WordStar or (formatted) ASCII-file. In the case of ASCII-files please write to D. H. Vitt. In any case the print commands for boldface and underlined should be omitted or retained. Free disks can be obtained from J-P. Främ, Universität Duisburg, Fachbereich 6, Botanik, Postfach 101629, 4100 Duisburg, Federal Republic of Germany.

INTERNATIONAL SYMPOSIUM OF BRYOPHYTE ECOLOGY
EDINBURGH, JULY 1988

The British Bryological Society and the British Ecological Society are jointly organizing an International Symposium on Bryophyte Ecology to be held at the University of Edinburgh from 19 - 21 July 1988. It will be followed by a field meeting at Beatty, Invernesshire, from 23 - 30 July, organized by Mr. David Long. The symposium will consist of four sessions of invited papers relevant to currently active areas of research plus poster sessions and sessions of contributed papers. The invited speakers and their topics are listed below.

Session 1. Bryophyte production and decomposition
Tundra ecosystems. S. Russell
Temperate ecosystems. D. H. Vitt (Edmonton, Alberta)
Tropical ecosystems. J.-P. Främ (Duisburg)
Physiological basis of bryophyte production. M.C.F. Proctor (Exeter)

Session 2. Interaction between bryophytes and other organisms
Bryophytes and nutrient cycling. D. H. Brown (Bristol) and J. W. Bates (London)
Bryophyte interactions with other plants. H. J. Duing and B. van Tooren (Utrecht)
Entomophily in the Sphaecnaceae. A. Koponen (Helsinki)
Bryophyte herbivory. A. J. Davidson (Reading)

Session 3. Population biology
Reproductive strategies in mosses. R. E. Longton (Reading)
Genetics and structure of hepatic species. M. E. Newton (Manchester)
Bryophytes and ecological niche theory. N. G. Slack (Troy, New York)
Bryophytes and plant strategy theory. J. P. Grime (Sheffield)

Session 4. Bryophytes in man-modified ecosystems
Bryophytes and heavy metal accumulation. G. Tyler (Lund)
Responses of bryophytes to mineral deposition. J. A. Lee (Manchester)
Influence of man on the European bryoflora and vegetation. J. H. Dickson (Glasgow)
Effects of forest disturbance on tropical bryophytes. D. H. Norris (Arcata, California)

Offers of posters and contributed papers should be sent as soon as possible, and not later than 31 March 1988, to the Programme Secretary, Dr. R. E. Longton, Department of Botany, The University, Reading RG6 2AS, UK. Details of accommodation and related matters are available from the Local Secretary, Dr. P. J. Lightowlers, I.T.E., Penicuik, Midlothian EH26 0Q8, Scotland.

AETFAT CONGRESS
Hamburg, West Germany.
4 - 10 Sept. 1988

AETFAT (Association for the Taxonomic Study of the Flora of Tropical Africa) Congress, Symposium V, will be on African Lichenology and Bryology. Convenor: D. Wessels. Members who wish to contribute to Symposium V are requested to contact Dr. Robert E. Magill, Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166, for papers or posters dealing with lichenology and Bryology and Dr. D. Wessels, University of the North, X1106, Sovenga, 0727, South Africa, for papers or posters dealing with lichenology.

Those interested in membership or Congress information should write to the Secretariat, Institut für Algemaine Botanik, Ohnhorstr. 18, D-2000 Hamburg 52, West Germany - Allemagne Federale.
production more external auxin molecules per cell are necessary. Non auxins (2,4-D, NAA), cytokinins or gibberellins do not increase caulonemal differentiation (Johri 1978).

The results of the suspension culture studies were confirmed by Lehner and Bopp (1983) and extended to experiments on a solid agar substrate at low irradiance (ca. 10 m 2/s LLI). Here protomena grow only as caullions, once treated with IAA, the formation of oblique cell walls characteristic of caullions is immediately induced. Optimal effects occur at 10 to 100 nol IAA/1 (Lehner and Bopp 1983). Caulonema are the exclusive site for bud induction by cytokinins in Parnar is hynngrometrics and LLI protomena can react to cytokinin only when pretreated with auxin (Lehner and Bopp 1983). Therefore in LLI the number of buds induced by kinetin can be used to quantify the auxin effect. The subsequent effects of the two hormones was called a "sequential interaction" by Bopp (1979).

The effects of IAA have been reproduced with 2,4-D, NAA and precursors of IAA found in higher plants. The main biosynthetic pathway of IAA in higher plants is tryptophan, indole-3-pyruvic acid, indole-3-acetamide and IAA (Fig. 1). Intermediates of 3 other pathways are indole-3-acetone, tryptamine and indole-3-acetamide. The latter is an intermediate of the auxin formation in crown gall tumors, where the genes for this pathway have been identified (Schröder et al. 1985). In mosses, tryptamine and indole-3-acetone do not induce caulonema. This suggests that the pathways via tryptamine and indole-3-acetone do not seem to exist in bryophytes. If the two other pathways are working the enzymes necessary for the transformation of the precursors must be present. In a cell-free system prepared from Parnar is hynngrometrics protomena, [H]tryptophane is metabolized into IAA via the indole-pyruvate pathway (Jayasingal and Johri 1985).

Further evidence for the involvement of internal auxins in mosses derives from experiments with auxin antagonists. Caulonema reverses to chloronema when treated with parachlorophenoxo-isobutyric acid (PCIB), an antagonist to auxin in mosses (Sood and Hackenberg 1979, Bopp 1980). In the presence of PCIB cell diameters become smaller and all further cross walls are transverse. The number of chloroplasts increases and elongation is retarded. These experiments show that endogenous auxin must be present and active.

The pathways of auxin synthesis are illustrated with interrupted lines (after Lehner and Bopp 1983).

In contrast, experiments with "auxin-resistant" mutants of Parnar is hynngrometrics (NAR) indicate a different cause. Five mutants were selected on a substrate with a high concentration of NAA (5-50/μL). Most clearly defined mutant, NAR 2, behaves as a type 4 mutant of P. patens. Normal development can be restored by a supplement of about 1/μL IAA, NAA or 2,4-D. The precursors indicated in Fig. 1 induce the formation of caulonema. Only tryptamine has no significant effect similar to that observed in the wild type (Bhata and Bopp 1985). There fore, a block in the biosynthetic pathway between tryptophan and IAA cannot be the reason for auxin deficiency. Furthermore the same experiments exclude the possibility of reduced sensitivity.

A comparison of the activity of auxin oxidases in the soluble and particular protein fraction of the wild type and the NAR 2 (calculated per q fresh weight) gives significantly (up to 20 times) higher values in the mutant than in the wild type. The differences in mean quantities of the oxidases which change during growth are smaller than those in activity but the mutant always contains (continued on page 5.)
higher IAA oxidase activity. In contrast to auxin oxidizes per- oxidase activity in the mutant is always much lower than in the wild type (Bhatia and Bopp 1985).

Thus, in NAR 2 and probably in the other deficient mu- tants also) auxin degradation seems to be specifically stimu- lated by oxidase. This might be expected from the selection of the mutants using high auxin in treatment: only those with an efficient degradation sys- tem can tolerate high auxin concentrations in the medium.

For a considerable period nothing was known about interior auxins in mosses (Cove and Ashton 1984). However, in the last few years, three reports have demonstrated unequivocally that IAA is a natural constituent of the moss protonema. Ashollow et al. (1985) found 2.1 ng/g dry weight (dw) IAA in F. patens using gas-chromatog- raphy and ion monitory mass spec- trometry. Jayaswal and Johri (1985) found between 1.9 and 5.0 ng/g protonema cells (fw) with an indole-pyrene fluoro- metric assay.

Both results show that IAA is present in concentrations sufficient to induce the transition from chloronema to caul- onema. In cultures of F. hyg- ronemetics E. Weller (Osnavrück, personal communication) has an- alyzed IAA content with an enzyme immunoassay (Bopp and Bhatia 1985). The concentrations for the wild type grown in HLI conditions was about 0.4 n mol g⁻¹ fw (or 70 ng g⁻¹ fw), which may be about 10 times higher as in the two proceeding papers; in LLI about 0.15 n mol g⁻¹ fw was found (depending on the age of the protonema) and the mutant NAR 2 contained 0.12 n mol g⁻¹ fw (in HLI). These figures should be viewed with caution since amounts of auxin can vary according to the method of ex- traction and the sensitivity of the test. For example Markmann-Mullisch (1985) found between 1.1 and 18.5 ng g⁻¹ dw of IAA in protonema of Polytrichum formosum depending on the extrac- tion method. More significant than absolute amounts are values for protonema in different conditions of in the mut- ants. At LLI the IAA content of the wild type is about one third of that at HLII. At HLII the mutant contains the same amount as the LLI wild type. This result is in agreement with the values expected from the auxin treatments.

It thus seems clear that endogenous auxin (in the range of (10⁻⁶ mol/g fresh weight is responsible for the transi- tion from chloronema to caul- onema. Any situation which lowers the endogenous auxin content e.g. PCH treatment, low light intensities, culture in a suspension and mutants with blocked biosynthetic path- ways or with high rates of de- gradation (only the latter has been demonstrated to date) must result in the suppression of caulonema formation.

A further important aspect to our understanding of the end-ogenous regulation of differ- entiation by auxin comes from the following observation. When the apical cell of a caulonema is killed, all cells lose their caulonema character (Knoop 19-76, 1984). This indicates that a signal from the apical cell maintains the caulonema status in all cells of the filament. This signal is almost certainly auxin. In fact auxin is trans- ported from the tip to the base of a rhizoid or caulonema fil- inent in a strong polar manner (Larouch-Gouraud 1974; Bopp and Knoop 1974; Rose and Bopp 1983). The transport mechanism includes a pH dependent passive auxin influx (Rose et al. 1983 a, b). Details of this mechan- ism seem to be different from those described in higher pl- ants, but far more experimental data are needed.

Regarding the mechanism of auxin action the first step ap- pears to be the binding of the hormone to a membrane-bound re- ceptor (Venis 1983). The nature of an auxin receptor in mosses is completely unknown. In the only investigation to date max-Reichert et al. (1982) found that auxin binding was barely detectable in total membrane preparations of auxin-resistant and wild type Physcomitrella patens.

[continued on page 6.]

Figure 2. 9 categories of auxin/kytokinin sensitive mutants of Physcomitrella patens (modified from Cove and Ashton 1984)
Auxins in Mosses (continued from page 5.)

References


Personalia

DR. GUY R. BRASSARD has accepted a position as Executive Director of the Association of Canadian Universities for Northern Studies for two years. He will be on leave from Memorial University of Newfoundland, St. John's, and based in Ottawa, Ontario. He will continue his research on bryophytes of northern and eastern Canada. Dr. Brassard's new address is: c/o A.C.U.N.S., 130 Albert St., Suite 300, Ottawa, Ontario, Canada K1P 5D4. Material destined for the Bryophyte Herbarium at Memorial University (NFU) should continue to be sent to St. John's.

DR. D. Y. JOSHI, Department of Botany, Abasaheb Garware College (Research) Centre, Pune 411 004, India, has had his research project on the bryophyte flora of the tropical rain forests of the Andaman and Nicobar Islands approved by the Department of Science and Technology, Government of India. The main objective of the project is to explore bryophytes on various islands of the Andaman and Nicobar Group.

DR. MING-JOU LAI, P.O. Box 19 - 004, Taipai, Taiwan 24199, ROC or P.O. Box 834, Tunghal University, Taichung, Taiwan, 40704, ROC, spent two months (June 14 to August 15) at the Botanical Museum, University of Helsinki, Finland, on a scholarship from the Academy of Finland.

DR. JETTE LEWINSKY, Botanical Museum, University of Copenhagen, will be working as a visiting research fellow in the Department of Botany, University of Melbourne, Parkville, Victoria 3052, Australia, for one year from mid-November 1987. Her work will be concentrated on a taxonomic revision of the genus Bryophyton for Australasia.
The Bryological Times

INDEX MUSCORUM. 1963-1973

by

M. R. Crosby and R. E. Magill

The nomenclatural information for the “missing years” of the Index muscorum, 1963 through 1973 inclusive, is being compiled and edited at the Missouri Botanical Garden. Publication is planned for 1989. Like the two-year supplements that have been appearing regularly in Taxon and other journals, the information in the eleven-year supplement will be purely nomenclatural, in line with the principle that the index be a useful nomenclatural tool for the horticultor and taxonomist. The Index muscorum, as with the two-year supplements, is an attempt to verify each record for a moss or liverwort species, including all cross-reference basionyms and other needed citations. Unlike the Index muscorum, we are attempting to catalog names at all ranks for mosses, including formae and fuscoiderentes, and those above genera.

The most important portion of the TROPICOS botanical database system is being used for this work. The basic information is nearly all in most, and citations as being verified. We would greatly appreciate readers of the Bryological Times sending us reprints or reprints of publications containing nomenclatural information published anytime between 1 January 1963 and the present. As a guide to what we have in the database, the entries are based, for the most part, on the titles that appeared in the recent literature on mosses series in The Bryologist for the years 1973 to the present. Thus, any references containing nomenclatural information not in those lists would be welcomed.

In order to make the supplement to the Index muscorum more easily managed, we now plan to merge all of the two-year supplements into the eleven-year supplement to produce a twenty-five-year supplement covering the years 1963 through 1987. Since the information is all computerized and in a data base format, titles of publications and names of authors are being coded, resulting in uniformly spelled or abbreviated entries, unlike the Index muscorum.

The number of entries to appear in the twenty-five-year supplement is about 6,500 and this should grow to approximately 7,000 when all needed cross referenced names have been coded for inclusion. Since virtually all of the citations for the twenty-five-year supplement will have been verified against their original place of publication, the quality of the data will be very high, representing over eight percent of the entries in the index to moss names.

In addition to the index to plant names, MOST contains a great deal of distributional information about mosses and a bibliographic of some 3,800 literature citations for moss literature. Readers interested in knowing more about the system and about ways that they might make use of it are encouraged to write to the authors.

Missouri Botanical Garden, PO Box 299, St. Louis, Missouri 63166-0299, U.S.A.

Publication of Bryophyte/Lichen/Fungi/Algae Monographs in Flora Neotropica

THE ORGANIZATION FOR FLORA NEO TROPICA (OFN) aims to publish a complete Flora of Tropical America. Since 1967 over 45 volumes have appeared and many are in preparation. Monographs published thus far deal primarily with angiosperms, some with fungi. To facilitate the publication of treatments of small neotropical groups of non-vascular algae (bryophytes, lichens, fungi, algae) Flora Neotropica has begun issuing special volumes devoted to each of these groups. Each special volume will consist of at least 100 printed pages and contain one or several taxonomic treatments. Authors may purchase reprints of their articles and will receive a complimentary copy of the entire volume.

Publication of the special volumes will be co-ordinated by S. Rob Gradstein, (University of Utrecht, Deput Director of Cytogenes of the ONP, Institute of Systematic Botany, P.O. Box 85, 3508 AC Utrecht, The Netherlands, who will be pleased to supply further information on requests.

FRAMH, J.-P. & W. FREY 1987. Moonflora, 2nd revised edition, 529pp with 108 plates UBB 1520, Stuttgart (Ulmer). Price DM25.80 paperback; DM65 hardcover. Four years after publication, the first edition of this German bryophyte-flora was sold out. The second edition is more or less a reprint of the first. It includes some corrections, typographic changes and additions as well as species in the meantime reported new to Germany. These are treated in an appendix. The book was produced as part of a series of University textbooks to reduce the price for students and at c. $15 for 255 pages (paperback) is very cheap. However, for librarians or people who do not like a paperback that does not remain open on the desk, part of the new edition is available with hardcovers at more than double the price.

Recent Publications

[Bryonanima, Issue 8, 1987.]

For a strictly limited period of time, until 15 January 1988, the International Association for Plant Taxonomy is offering for sale full 5-vol. sets of Index muscorum at US$120 per set plus postage. The normal advertised price is US$435 per set, incl. postage.

Orders should be sent directly to IAPT, Institute of Systematic Botany, Heidelberglaan 2, 3584 CS Utrecht, The Netherlands.
SOCIETY NEWS

THE BRYOLOGICAL SOCIETY OF JAPAN (BSJ) elected new officers for Sept. 1987 - Aug. 1989 at the General Meeting in Yamagata, 22 August 1987. They are:

President .... H. Ando
(Ritsumeikan University of Music)
Secretary .... Z. Iwatsuki
(Hiroshima University)
Treasurer .... M. Higuchi
(Hiroshima University)
Auditor .... N. Kitagawa
(Nara University of Education)
Editor ....... H. Deguchi
(Kochi University)
Associate Editors ...
J. Hasegawa (Kyoto University)
T. Furuki (Hiroshima University)

The secretariat of BSJ was moved from the National Science Museum, Tokyo to Hiroshima University. All communications to BSJ from 1 September, 1987, onwards should be addressed to: Secretary, Bryological Society of Japan, Botanical Institute, Faculty of Science, Hiroshima University, Higashi-Senda-Machi, Hiroshima 730, Japan.

Hiroomori Deguchi, Department of Biology, Faculty of Science, Kochi University, Akebono-cho, Kochi-shi, Kochi 780, Japan.

EDITOR'S ADDRESS

The editor is pleased to announce that for the foreseeable future his address, for all professional correspondence, remains unaltered, viz: The University of Reading, Department of Botany, London Road, Reading, Berkshire, RG1 5AQ, U.K. (Telex 647813 BULLID).

DIARY

For explanation of acronyms, see Bryol. Times, 31:7-8, 1985.

1987

Nov. 8. VMGB. Field trip to Herseldt-Westervoer (Prov. of Antwerp). Meet at Herselt Church at 09.30 hours.


November. John Childe Memorial Foray to northern part of South Island, New Zealand. Further details from: Ms Gail Frarho, Cawthorn Institute, P.O. Box 175, Nelson, New Zealand.

1988

April 6-13. EBS. Spring Field Meeting, Cirencester. Local Sec.: Miss K.A. Hearn, The National Trust, Spitalgate Lane, Cirencester, Gloucestershire GL7 2DS, U.K.


July 24-30. BBS. Summer Field Meeting, Aigas Field Centre, Beauly, Invernesshire. Local Sec.: Dr. P.J. Lightowler. Participation at the BBS ecological symposium (see July 19-23) will be most welcome.

Aug. 5-7. BSJ 17th Annual Meeting, Sanda City, ca. 25km N of Kobe City, with paper-reading sessions and field study. Further information from Dr. N. Kitagawa, Biological Laboratory, Nara University of Education, Takakatake-cho, Nara 630, Japan.

Aug. 7-11. AIBS Annual Meeting in conjunction with ABMS meeting, University of California - Davis, U.S.A.

Aug. 7-12. NBS Annual Meeting and Excursions, Kitee, Pajarinhovu Travel Centre, Finland. Further details from Dr. Matti Hapasaari, Kuopio Museum of Natural History, Mykkyrinta 22, 70100 Kuopio, Finland.


Sept. 12. 6th CEBWG Meeting, Liblice (Village near Mělník) Czechoslovakia. For preliminary announcement of this 4-5 day meeting, see Bryol. Times, 40:10.

Sept. 17-18. BBS. A.G.M. and paper reading meeting, Liverpool. Local Sec.: Dr. J. Edmundson, County Museums Dept., William Brown St., Liverpool L3 9JU, U.K.

1989

Aug. 6-10. AIBS Annual Meeting in conjunction with ABMS Meeting, Univ. of Toronto, Canada.

1990


THE INTERNATIONAL ASSOCIATION OF BRYOLOGISTS publishes The Bryological Times every two months, the Bulletin of Bryology twice a year, and the Advances in Bryology irregularly. Material for the Bryological Times can be sent at any time, but submission dates for the Bulletin and the Advances should be discussed with the Editors, Dr. Diana G. Horton (University of Iowa) U.S.A. and Dr. Martin G. Miller (Albany) U.S.A. respectively. The Editors do not accept responsibility for the views of the authors.

For details regarding membership of the International Association of Bryologists (currently U.S. $10.00 p.a.), write to the Honorary Secretary, Dr. Dale H. Vitt, Department of Botany, University of Alberta, Edmonton, Alberta, T6G 2E9.

THE BRYOLOGICAL TIMES is published in Reading (U.K.) and distributed from Beijing (China), Eger (Hungary), Reading (U.K.), St. Louis (U.S.A.), Tokyo (Japan) and Utrecht (The Netherlands). All correspondence concerning mailing to: Rob Kuijt, Institute of Systematic Botany, Heidelbergstrasse 2, 3584 CS Utrecht, The Netherlands.

ITEMS FOR THE NEXT ISSUE to be with the Editor, Dr. S.W. Greene, Department of Botany, The University of Reading, London Road, Reading RG1 5AQ, Berkshire, England (Telex 847813 BULLID) by the 1st December, at the latest. Items for the regular columns should be sent direct to the column editors, whose names and addresses will be found in Bryol. Times, 31:9, 1985.

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