

# International Organization of Plant Biosystematists

Newsletter

No. 21

Edited by

K. M. Urbanska

D. J. Crawford

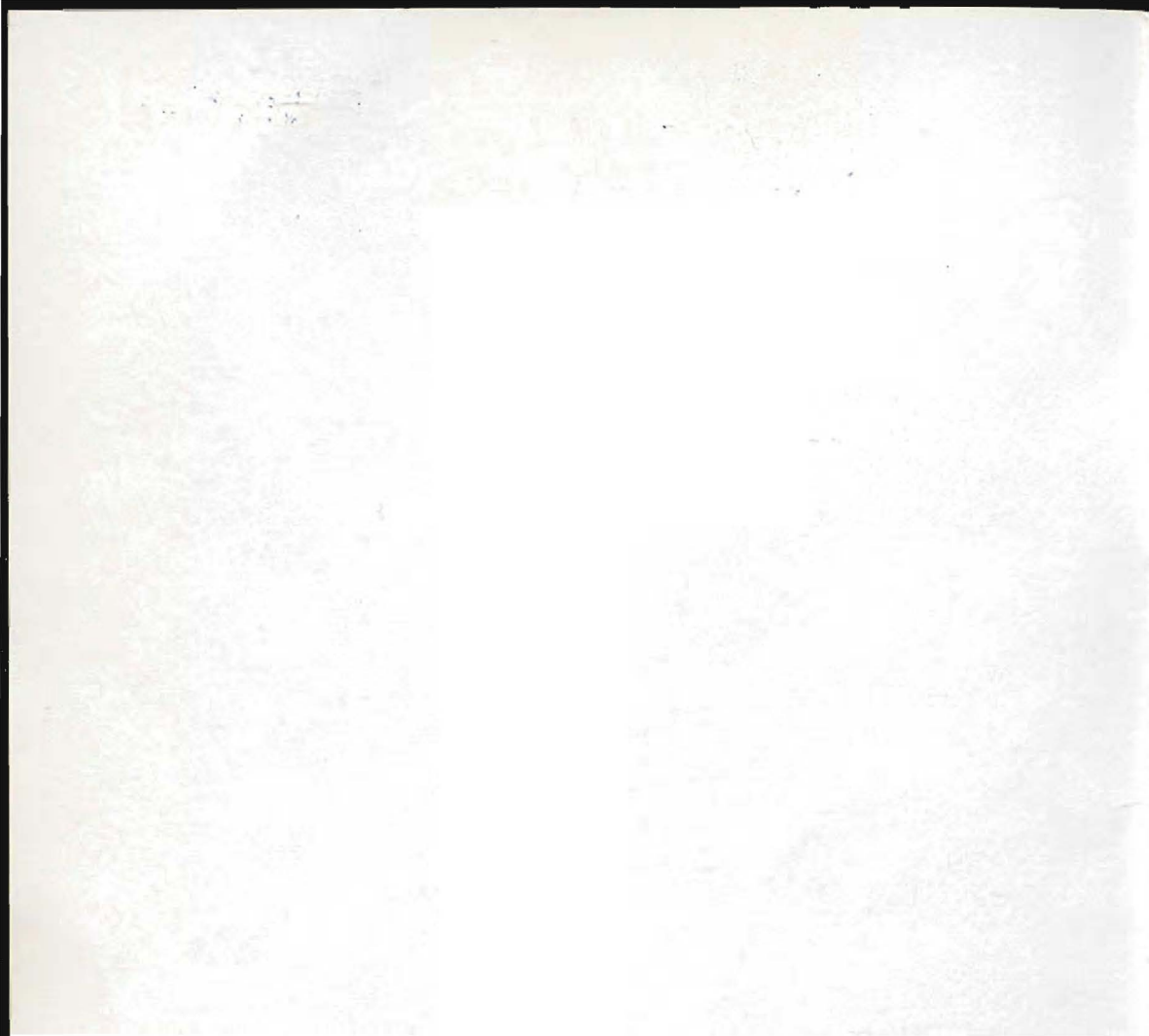
C. A. Stace



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The Department of Geobotany  
Swiss Federal Institute of Technology

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**International Organization of Plant Biosystematists**

P.1423

**Newsletter No. 21**

**Contents**

1. Editorial Comment	2
2. IOPB Chromosome Data	3
3. News from Molecular Biosystematists	4
4. Individual Research News	7
5. Flora Nordica Field Work in Lapland, July 1993	8
6. Profile of a Lab	9
7. IOPB Symposium 1995 - News from the Organizing Committee	14
8. About 1993 Symposium Book	15
9. Meetings, Past and Future	15
10. Notes from our Treasurer	17
11. Requests for Material and/or Information	19
12. Miscellaneous News and Notes	19

IOPB Executive and Council	21 - 22
Membership Application Form	
Research News Form	



## 1. Editorial Comment

Dear IOPB Members,

The time for the new issue of your Newsletter has come. The "menu" of the Newsletter is, as always, varied and hopefully will make a good reading. Thanks to all contributors for their interesting input. It is very good that the research news appear in this Newsletter both as contributions to a given column as well as individual reports. Your Editor will be TRULY grateful if you send reports, esp. longer ones, both as printout and a microdisc (see the note at the bottom of this page). We have no secretarial help anymore and I have to process myself the whole text. Thank you for responding to this appeal.

The "IOPB Chromosome Data" column (p. 3) is small this time; let's hope there will be more data in the next issue. You certainly have some chromosome counts to publish; send them to Clive Stace, don't keep them in your files.

The data for "Molecular News" (p. 4) begin to flow in. Please help Dan Crawford by sending your contributions, if only possible not at the last moment. PLEASE don't forget to send them on discs, the text processing from partly garbled faxes is particularly complicated for a humble plant biologist a.k.a. your Editor who does not carry out molecular studies!!!

On p. 8 you will find a note on a field work in Lapland where some IOPB Members (and non-members, too) involved in the Flora Nordica project pitched their tents for a while. This was a truly exciting experience. Dr. Sigmund Sivertsen, leader of our expedition, contributed this report. Thanks, Sigmund.

"Profile of a Lab" includes this time reports from three areas as far apart as France, Japan, and Czech Republic (pp. 9 - 13). Sincere thanks to the authors for their effort. It is good to see that our Council Members contributed again to this column.

Work on the 6th IOPB Symposium 1995 is going on, and the First Circular is now being prepared. The excerpts of this Circular contributed by our Vice-President can be found on p. 14. Thank you Bengt for this important information. Please note that IOPB Members of a good standing have considerable advantage as far as the Symposium fee is concerned. In this connection, a careful scrutiny of our Treasurer's notes (p. 17) would come useful... Should your payment of the current membership fee still be forgotten, please think about it NOW.

Our Past-President Shoichi Kawano just sent in a report on an interesting symposium held in Japan in late summer this year (p. 15). Thank you Shoichi, our Members undoubtedly appreciate a thorough information on the current progress in the field of plant biology.

Data for Newsletter No. 22 should arrive here before May 31, 1994.

All the best wishes for 1994  
The Editor

**NOTE:** Please write in capital letters or use typewriter while preparing your "Research News" sheet for the Newsletter. You don't want to have some words misspelled in print, do you?

It would be a great help if the contributions could be sent both on RPS Microdisc (MC2HD 3.5 inch hard disc) as well as a printout. Also, we are able to convert the contributions which we receive in an ASCII text file on 3.5 or 5.25 inch disc formatted for Macintosh or DOS.



## 2. IOPB Chromosome Data 6

edited by Clive A. Stace  
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Please send contributions to Professor Stace at the above address on RPS Microdisc with text in ASCII-file and a printed copy, using the exact layout of the present list and stating whether or not you are a Member of IOPB. Neither proofs nor reprints will be made available, but the editor will acknowledge receipt of contributions and raise queries with authors if necessary. Thank you.

\* \* \*

Reports by S. Y. KAMBLE, Department of Botany, University of Poona, Pune - 411 007, Maharashtra, India. All localities in Maharashtra, India. Vouchers are in BSI.

### ASPARAGACEAE

*Asparagus racemosus* Willd. n=10. Patur, Akola district. Kamble 152 656.

*Asparagus laevisissimus* Steud. n=10. Medshi, Akola district. Kamble 152 507.

*Asparagus gonoclados* Bak. n=10. Experimental Garden of Botanical Survey of India, Pune. Kamble 161 044.

*Asparagus adscendens* Roxb. n=10. Garden of Jawaharlal Nehru Ayurvedic Medicinal Plants Garden and Herbarium, Kothrud, Pune. Kamble 161 057.

### BIGNONIACEAE

*Crescentia cujete* L. n=12. Experimental Garden of Botanical Survey of India, Pune. Kamble 161 015.

### CACTACEAE

*Epiphyllum macropterum* Britton & Rose n=11. Experimental Garden of Botanical Survey of India, Pune. Kamble 161 021.

### CONVOLVULACEAE

*Ipomoea petaloidea* Choisy n=15. Morna, Akola district. Kamble 152 761.

### OROBANCHACEAE

*Aeginetia indica* L. n=15. Raipur and Tarobanda, Amravati district. Ansari 144 004.

### ZINGIBERACEAE

*Costus speciosus* Smith n=9. Tarobanda, Amravati district. Kamble 144 025.

\* \* \*

Reports by **S. I. WARWICK**, **L. D. BLACK**, and **J. K. ANDERSON**, Centre for Land and Biological Resources Research, Agriculture Canada, K.W. Neatby Bldg., C.E.F., Ottawa, Ont., Canada K1A 0C6. All material was grown from seed received from the crucifer germplasm collection of Dr. C. Gómez-Campo, Instituto Nacional de Investigaciones Agrarias, 28003-Madrid, Spain (GCC number). Vouchers, which are in DAO, are listed as a BCN number.

#### BRASSICACEAE

*Didesmus bipinnatus* (Desf.) DC. n=8. 2n=16. Algeria: between Biskra and Bou Saada (35°N 2°E) (GCC 240-1853-70; BCN 3620).

*Erucaria erucarioides* (Coss. & Durieu) C. Mueller 2n=16. Algeria: near Béchar (32°N 2°W), arid stony plains (GCC 287-1944-71; BCN 8067).

*Foleyola billotii* Maire n=16. Morocco: near Zagora (30°N 5°W), arid steppes (GCC 370-1481-68; BCN 3637).

*Moricandia foleyi* Batt. n=11. 2n=22. Morocco: S. of Merzuga (31°N 4°W), desert riverbeds (GCC 477-5549-80; BCN 8117).

*Schouwia purpurea* (Forssk.) Schweinf. n=18. Egypt: Wadi Kharit (24°N 33°E) (GCC 530-5780-81 under synonym *Schouwia thebaica* Webb; BCN 8087).

*Trachystoma labasii* Maire n=8. 2n=16. Morocco: near Beni Mellal (33°N 5°W) (GCC 591-3014-74; BCN 3208).

\* \* \*

### 3. News from Molecular Biosystematists 2

edited by Dan J. Crawford  
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The Ohio State University  
Columbus, Ohio 43210-1293, USA  
Fax 614-292-6345



Please send your contributions to Professor Crawford at the above address, if possible on RPS Microdisc with text in ASCII-file on 3.5" or 5.25" disc formatted for Macintosh, and stating whether or not you are IOPB Member. Thank you.

\* \* \*

DNA news from **Randall J. Bayer**, IOPB Council Member; Dept of Botany, Univ. of Alberta, Edmonton, Alberta T6G 2E9, Canada

My primary research interests concern systematic and evolutionary studies with *Antennaria* (Asteraceae), a genus of perennial herbs that occur throughout the Northern Hemisphere. My major project during the past year was the reconstruction of a molecular phylogeny



of *Antennaria*, using RFLPs in cpDNA . This study is now complete and in it I looked at the phylogeny of 29 sexual species of the genus. The molecular data provide strong evidence for the monophyly of major clades in the genus, but can not resolve much of the phylogenetic tree beyond the major clades. The chief difficulty in using cpDNA for phylogenetic studies in *Antennaria* has been that it is for the most part much too conservative when looking at phylogeny within the genus ; other workers within the family Asteraceae have had similar results.

The taxonomic position of *A. geyeri* based on RFLPs in cpDNA remains controversial as it appears to be indistinguishable from *Anaphalis margaritacea*. Also, *Anaphalis* appears to be the closest sister group to *Antennaria*. Basically, the molecular tree agrees with the one based on morphology quite well. However, some relationships stil remain open to verification because cpDNA did not provide us with enough phylogenetically meaningful characters to fully resolve the problem.

I believe that many of the uncertain relationships can be elucidated through the use of additional molecular systematic studies. The 18-26S nuclear ribosomal DNA gene family (nrDNA) has been used effectively at various levels of phylogenetic study from the family down to the species level. Most of the variation in nrDNA has been found to occur in the intergenic spacer region (IGS) and internal transcribed spacer region (ITS). My primary goal is to produce a phylogeny for all Antennarias (about 35 species) based on sequence divergence in ITS1 and ITS2. In order to meet these objectives I will be spending my sabbatical leave 1994 learning the sequencing techniques in the lab of Drs. Douglas and Pamela Soltis at Washington State University, Pullman. I have obtained DNA of all the sexual species of *Antennaria* that will be needed in this study, including the rare Norwegian endemic *A. nordhageniana* collected by Krystyna M. Urbanska on her recent field trip to the Lapland\*. Sequencing the ITS region of species of *Antennaria* will lead to the production of the first molecular phylogeny for the genus based on sequence data.

\* see the report on this field work on pp. 8-9.

\* \* \*

News of molecular-systematic activities from the labs of **Pamela and Douglas Soltis**, Dept of Botany, Washington State University, Pullman, WA 99164-4238 USA.

Several phylogenetic projects are under way involving comparative DNA sequencing of the chloroplast genes rbcl and matK, and also nuclear 18S and ITS. In collaboration with Peter Martin, David Morgan, Susan Swensen and Beth Mullin we are using rbcl sequence data to look at the phylogenetic relationships among those angiosperms which are capable of nitrogen fixation via root nodules. We are also collaborating with David Morgan and Peter Martin on phylogenetic analyses of Proteaceae and the relationship of these plants with other angiosperms. We have recently completed in-depth rbcl sequence analyses of Rosa-



ceae, Cornaceae *s. l.*, Apiales, Cyperaceae/Juncaceae, and Taxodiaceae/Cupressaceae, the latter in collaboration with Steve Brunsfield, Paul Gadek, Chris Quinn, and Tom Ranker.

We have also explored the utility of comparative matK sequencing for phylogenetic inference. This chloroplast gene proved to evolve at least three times faster than rbcL. The gene is easily amplified using PCR primers located in the conserved trnK regions that flank matK. Comparative matK sequencing in Saxifragaceae *s. s.* has resulted in phylogenetic trees comparable to those achieved for the same taxa via restriction site analysis of chloroplast DNA, with much more resolution than obtained in the study of rbcL sequencing. Sequencing of matK is now being used extensively in the study of Saxifragaceae *s. s.*, Apiales, Cornaceae, and Polemoniaceae.

We are sequencing 18S rDNA in collaboration with other investigators (Dan Nickrent and Sara Hoot) in hope of obtaining a broad sequence data base of complete 18S rDNA sequences for angiosperms. Ultimately, our goal is to compare 18S trees with phylogenetic trees obtained for angiosperms using rbcL sequences. ITS sequence data are being used to address phylogenetic relationships in *Lomatium* and in Saxifragaceae *s. s.* One of these studies involving the *Heuchera* group (Saxifragaceae) demonstrated significant discord between cpDNA and ITS phylogenetic trees for the same taxa. The discord is due, we feel, to hybridization and subsequent chloroplast capture.

We are also comparing phylogenetic pattern to phylogeography ("phylogeography" *sensu* Avise) in several studies involving taxa of the Pacific Northwest. In *Lomatium triternatum* for example, geographic patterns of genetic differentiation correlate well with the location of massive post-glacial floods in Washington. We are also using cpDNA restriction site variation and nuclear allozyme data to explore the extent of "isolation by distance" in *L. triternatum* and to estimate relative rates of nuclear (pollen) vs. cytoplasmic (seed) gene flow.

Our lab continues to pursue studies of polyploidy using *Tragopogon mirus* and *T. miscellus* as models. Currently underway is a comparative study of outcrossing rates in these two tetraploids and their diploid progenitors. We have also initiated a study to investigate the extent of multiple origins in these tetraploids using RAPD markers. Proposed are studies of polyploid formation and genome reorganization.

Students involved in these projects are Gregory Plunkett, Qiu-Yun Xiang, Leigh Johnson, Joanna Schultz, Linda Cook, Daren Strenge, Allen Campbell, and Christopher Looney. New students Bob Kuzoff and Mike Hardig have not yet selected their projects.

\* \* \*

#### 4. Individual Research News

**BROCHMANN** Christian, Division of Botany, Dept of Biology, University of Oslo, P.O.Box 1045. Blindern, Oslo, Norway:

Recent publications:

Brochmann C. and Elven R. 1993. Ecological and genetic consequences of polyploidy in arctic *Draba*(Brassicaceae)- *Evol. Trends in Plants* 6(1992): 111-124.

Brochman C., Stedje B. and Borgen L. 1993. Gene flow across ploidal levels in *Draba*(Brassicaceae). *Evolutionary Trends in Plants* 6(1992): 125-134.

Brochmann C. 1993. Clinal and parallel evolution in the vascular flora of the Cape Verde Islands, W. Africa. *Courier Forschungs-Institut Senckenberg* 159: 67-85.

Eight further papers published 1992-1993.

**DOWNIE** Stephen R., Dept of Plant Biology, University of Illinois, Urbana IL 61801 USA:

Recent publications:

Knox E. B., S. R. Downie, and J. D. Palmer 1993. Chloroplast genome rearrangements and the evolution of giant lobelias from herbaceous ancestors. *Mol. Biol. Evol.* 10, 414-430.

Downie S. R. and J. D. Palmer. A chloroplast DNA phylogeny of the Caryophyllales based on structural and inverted repeat restriction site variation. Submitted to *Systematic Botany*.

Current projects:

Molecular systematics of Umbelliferae, particularly subfam. Apioideae.

Chloroplast DNA restriction site analysis of Caryophyllaceae.

**ZHUGE** Ren, Southwest Forestry College P. O. Box 48, Kunming, Yunnan 650224, P.R. China:

Recent publications:

Zhuge R. 1993. Taxonomic notes on the genus *Grewia* L.(Tiliaceae) in Yunnan. *Bot. J. S. China* 11: 18-24.

Current projects: Origin, dispersal and evolution of *Tilia*, one branch subject of the National Major Project: Floristic Geography of the Seed Plants in China.

Projects completed: Compiling the Tiliaceae in the FLORA YUNNANICA, as well as the Cupressaceae, Tiliaceae, Combretaceae, and Lythraceae in the ICONOGRAPHIA ARBORUM YUNNANICORUM.

Project started: Compiling the Celastraceae in the FLORA YUNNANICA.

\* \* \*



## 5. Flora Nordica Field Work in Finmark, Norway, July 1993

by Sigmund Sivertsen, Dept of Botany a. Museum, University of Trondheim, N-7004 Trondheim, Norway

In July 1993 a group of plant biologists made a field trip to Finmark, the northernmost Norway, to collect some data relating to the Flora Nordica project. Participants were: Bengt E. Jonsell, Krystyna M. Urbanska, Liv Borgen, Haavard and Vegard Osthagen as well as the leader of the group Sigmund Sivertsen.

On July 8, Krystyna and Liv were picked up at the Tromsø airport by Sigmund. The same evening we joined other members of our group at Lakselv (Finmark province) after a beautiful long drive. By courtesy of the Defense Authority of Northern Norway we were granted helicopter transfer to the mountains, very efficiently undertaken by the 330 Squadron at Banak Air Force Station. The military unit is in charge of rescue operations in this part of Norway and the Barents Sea.

Until July 16, our base camp was maintained SE of Lakselv at ca. 600 m a. s. l. Weather was beautiful so that mosquitoes had a ball... The growth of tundra plants was rather delayed owing to an exceedingly late snowmelt. The main objective of our stay within the area was to explore *A. nordhageniana* incl. the type locality, and also to search for *A. villifera* and *A. alpina*. In addition, general floristic and ecological observations and also collections of material for cultivation were made. We also visited one mountain so far not explored by botanists, but too much snow prevented any discoveries, alas. A visit of the rare snowy owl, and a dotterel nesting in the very middle of our camp were a special treat together with exquisite meals made from freshly caught trout and arctic char.

Back at Lakselv, Haavard and Vegard left us heading for other areas. We succeeded in spotting *Platanthera obtusata* ssp. *oligantha* near Skoganvarri at one of its very few Nordic sites. On July 17 we started east, making a stop at Børselv for some live material of *Viola rupestris* ssp. *relicta*. In these dolomite screes, Bengt found a *Tulostoma* (Lycoperdales), a northern limit of occurrence for this fungal genus; the species name is not established so far.

In this area, we could also study amongst others *Primula nutans*, *Gentianella aurea*, and the strongly disjunct *Trichophorum pumilum*.

From July 18 through July 20 further field work was carried out on the coast of eastern Finmark. Thick fog banks rolling in from the Barents Sea were hampering us in the work near Vardö, but live material of *Stellaria hebecalyx* was nevertheless secured. At Persfjord we studied *Senecio integrifolius* and *Arenaria pseudofrigida*. On the other hand, we did not succeed in our search for *Stellaria fennica* at Vadsö and did not find either *Trisetum subalpestre* at Vestre Jakobselv, the river bank sites still being flooded at the latter locality.

A trip to the Russian border at Svanvik was a good opportunity to visit a rare stand of *Picea abies* ssp. *obovata*, and also to see the considerable ecological damage caused by the



air pollution by emissions from a Russian aluminium smelter across the border.

On our way back to Tromsø we visited sites of *Thymus serpyllum* ssp. *tanaensis*, *Alnus incana* ssp. *koläensis*, *Thalictrum rariflorum*, and *Conioselinum vaginatum*. Our search for *Thalictrum kemense* remained unfortunately unsuccessful.

All in all, a good field trip with valuable plant material, and a lot of lasting memories.

\* \* \*

## 6. Profile of a Lab

**Current research at the Botanical Gardens, Faculty of Science, University of Tokyo**  
by Noriaki Murakami, Bot. Gardens, Univ. of Tokyo, Hanaishi-cho 1842, Nikko 321-14, Japan

The Botanical Gardens of the University of Tokyo consist of two gardens viz. the main garden in Koishikawa, Tokyo (161,588m<sup>2</sup>) and a branch garden in Nikko, Tochigi (104,850m<sup>2</sup>). The Koishikawa Garden collections include more than 4,000 plant taxa mainly from Japan and some from adjacent Asian countries including tropics. The Nikko garden hosts 2,200 taxa of temperate and alpine areas which are difficult to cultivate in Tokyo on account of very hot summers.

The main subject of research in our Botanical Garden is taxonomy and phylogeny of vascular plants. We are very involved, too, in conservation biology. Our research staff and main research interests of each staff member are listed as follows:

Kunio **Iwatsuki**, Professor: Systematics of Hymenophyllaceae; conservation biology.

Masahiro **Kato**, Ass. Professor: Systematics and comparative morphology of pteridophytes; morphology and evolution of rheophytes; fern flora of SE Asia.

Jin **Murata**, Lecturer: Taxonomy of Araceae (*Arisaema*, *Typhonium*, etc.); flora of China.

Noriaki **Murakami**, Research Associate: Taxonomy and molecular phylogeny of *Asplenium* sect. *Hymenasplenium*; evolution of apogamy; fern flora of China.

Mitsuyasu **Hasebe**, Research Associate: Molecular phylogeny of fern families; evolution of flower homeotic genes.

Shinobu **Akiyama**, Assistant (Herbarium and Library): Taxonomy of *Impatiens*; flora of Himalaya.

In addition to traditional taxonomic methods, we now extensively use molecular techniques (cpDNA RFLP, *rbcL* sequencing) to elucidate phylogenetic relationships in some groups. Our lab equipment includes automated DNA sequencer, Thermocycler for PCR as well as DNA synthesizer so that many sequence data can be collected rapidly and easily from various wild plants without use of radioisotopes. For instance, we are currently sequencing *rbcL* gene on cpDNA in various fern species.

As far as conservation biology is concerned, we succeeded in developing cultivation me-

thods of some endangered wild species such as *Melastoma tetramerum*, *Metrosideros boninensis* and *Rhododendron boninensis*. These species are endemic to Bonin Islands, less than ten individuals being known in their native habitats. To save them from extinction, we planted in Bonin Islands young plants issued from propagation.

We are actively engaged in the field work outside Japan (Indonesia, China, etc.). This field work is very helpful in studies on evolutionary biology of some groups, e. g. rheophytes. It is also pertinent to understanding the origin of some Japanese plant species. For instance, we found in China and other countries many sexual diploids of plant groups which are represented in Japan by apogamous taxa.

\* \* \*

### **Current Research of the Cytogenetics Group at the Lab "Evolution et Systématique végétales", Université Paris Sud**

by Delphine Cartier, IOPB Council Member, Bâtiment 362, Université Paris Sud, 91405 Orsay Cedex, France

The Cytogenetics Group is one of the three working groups in this lab managed by P. H. Gouyon. It consists of three research workers and two Ph.D. students working on the evolution of heterochromatin in species of *Crepis* and *Hypochoeris*. Our current study in the *Crepis praemorsa* complex may be outlined as follows:

The four species of *C. praemorsa* group are well suited to study of the heterochromatin evolution. While their respective karyotypes analysed after staining with Feulgen look similar, the number and position of heterochromatin bands (C-banding) vary from one taxon to another. *C. praemorsa*, considered the oldest according to its distribution and morphology has the smallest amount of heterochromatin, whereas the neo-endemic and the most differentiated *C. dinarica* has the largest portion. *C. froelichiana* and *C. incarnata* have intermediate heterochromatin content, the latter taxon being very close in this respect to *C. dinarica*.

We used fluorometric procedures to assess genome size and GC content in these species, modifying the classical and often erroneous interpretation of fluorescence ratios to an interpretation based upon binding statistics for base-specific dyes.

The measurements with ethidium bromide indicate that *C. dinarica* and *C. praemorsa* have significantly different 2C values which are respectively 11.8 and 10.5 pg DNA in concordance with their heterochromatic levels of 32 and 10 bands. *C. froelichiana* had an intermediate quantity of DNA, concurring with the intermediate heterochromatin content. *C. dinarica* and *C. incarnata* which both had a rather great number of heterochromatic bands, were not distinguishable from one another.

When base-specific DNA dyes viz. Hoechst for AT and mithramycine for GC were used to analyse the DNA content, it was shown that the mithramycine/ethidium bromide ratio significantly differed between *C. dinarica* and *C. praemorsa* indicating indirectly a distinct GC%. It is possible that the differences in GC content between the genomes of these most distant species of the complex correspond to addition of AT-rich complex sequences.



Such sequences were therefore sought at the chromosome level by fluorochrome-banding. The results of fluorochrome-banding with Hoechst 33258 and Chromomycin A3 were compared with the results obtained with Giemsa C-banding. It appears that most heterochromatin bands in *C. dinarica* are Hoechst-positive and Chromomycin-negative, and thus consist of AT-rich sequences. Heterochromatin rich in AT participates in both the absolute DNA increment, and the relative decrease of GC observed in this species. The *C. praemorsa* complex would accordingly represent an example of microevolution characterized by a link between DNA and heterochromatin amount.

Recent publications:

- Godelle B., Cartier D., Marie D., Brown C. S., Siljak-Yakovlev S. 1990. Relationship between flow cytometric determination on nuclear DNA content and the amount of heterochromatin within *Crepis praemorsa* complex. *Biology of the Cell* 70: 28.
- Cartier C. and Siljak-Yakovlev S. 1992. Cytogenetic studies of the F1 hybrids between *Crepis dinarica* and *C. froelichiana*. *Pl. Syst. Evol.* 182: 29-34.
- Godelle B., Cartier D., Marie D., Brown C.S. and Siljak-Yakovlev S. 1993. A heterochromatin: study demonstrating non-linearity of fluorometry useful for calculating genomic base composition. *Cytometry* 14, 9.

\* \* \*

#### **Current Research at Department of Taxonomy and Biosystematics, Institute of Botany, Academy of Sciences, 25243 Pruhonice 1, Czech Republic**

by Jan Kirschner, Head of the Department

The Department of Taxonomy and Biosystematics (DTB) is one of the research divisions of Institute of Botany (Population Ecology Group, Section of Plant Ecology, Department of Geobotany and the Section of Pruhonice Park should be mentioned as the other divisions). At the present time, 14 research workers and six technicians are members of the staff of the DTB. The Department is located at Pruhonice Chateau in the vicinity of Prague. There are no formal subdivisions of the DTB; the research groups depend on projects supported by external grants (from Academic Grant Agency and National Grant Office, etc.).

Research projects of the DTB include the following main subjects: (a) Taxonomic studies in the flora of the Czech Republic and adjacent territories; (b) Taxonomy of selected agamosperous genera of the Rosaceae, Malaceae and Compositae; (c) Taxonomy and spreading of synanthropic plants, and (d) monographic studies of some European taxa (see below). The biosystematic research mostly concerns various aspects of local differentiation, features of genetic diversity and endemism, and variation patterns of agamosperous groups.

The methods used at the Department include karyology, cytoembryology, isozyme techniques, analysis of selected secondary metabolites, and hybridization analyses. An experimental garden with glasshouses and open plots is a part of the DTB; phytotrons may be used as well. Herbarium specimens are preserved in the herbarium of National Museum (PR) whose botanical section is also located at Pruhonice.



## Current research projects

### 1. Flora of the Czech Republic

The Flora covers all the wild and commonly cultivated plants of the Czech Republic. First three (of eight) volumes appeared in 1988, 1990 and 1992 and include Pteridophytes, Gymnosperms and a part of Dicotyledons (Magnoliaceae to Malaceae); Vol. 4 is now edited, vols. 5 to 7 are under preparation. The whole project is supervised by Bohumil Slavík, and most members of the Department contribute to the Flora. Atlas of the distribution of the Czech plants is published parallelly to the Flora (Bohumil Slavík).

### 2. Population aspects of the endemism in the Krkonose Mountains.

Selected plants endemic (or subendemic) to the Krkonose National Park, NE Bohemia, are examined from the viewpoint of their evolutionary origin, current genetic diversity and conservation problems. Jan Stepánek is in charge of the project that includes studies on genetic relationships between *Carex serotina* subsp. *pseudoscandinavica* and other members of the *C. flava* group (Jitka Stepánková), differentiation of *Taraxacum nigricans* and *Taraxacum alpestre* (Jan Kirschner & Jan Stepánek), genetic erosion of *Viola lutea* subsp. *sudetica* under the introgression influence of introduced *Viola tricolor* (Franta Krahulec & Anna Krahulcová), cytoembryology, diversity and reproduction modes of selected *Hieracium* endemics (Jindrich Chrtěk jr.), effects of geographical isolation on the Krkonose population of *Myosotis alpestris* (Jitka Stepánková), and variation patterns of *Thymus alpestris* in the Krkonose and the W. Carpathians (Pavel Tomšovic & Jan Stepánek). A similar study dealing with the endemism in the Hruby Jeseník Mts. (N Moravia) is carried out by Miloslav Kovanda.

### 3. Microevolution in *Sorbus*

Miloslav Kovanda investigates various aspects of the differentiation processes in *Sorbus*. Patterns of reproduction modes, cytoembryology and microevolution of selected (mostly agamosperous) taxa are studied in depth.

### 4. Variation trends in an autogamous species with large geographical range, *Taraxacum bessarabicum*

Population samples from the whole range of *Taraxacum bessarabicum* extending from the Altai, C. Asia and Ukraine to Bohemia and France have been screened for isozyme variation, karyotype characters and morphology. Selected related taxa from Transcaucasia, Crimea and Anatolia were compared as well. Variation in reproductive traits characterizes otherwise almost homogenous species (Jan Kirschner, Jan Stepánek, Martin Tichý, Anna Krahulcová, Lída Kirschnerová).

### 5. The role of hybridogenesis in the microevolution of the genus *Taraxacum*

Selected groups of agamosperous taxa which have sympatric or parapatric distribution with sexual species hypothesized to represent their parental groups, are examined in

cultivation. Karyological, morphological and isozyme methods are used to demonstrate the parentage, differentiation and spreading of the derivative apomicts. In one case study, *Taraxacum stenolepium* and *T. stevenii* (both sexuals) as well as *T. confusum* group from the Caucasus are studied, in another one, diploid sexual members of *T. sect. Ruderalia* and *T. serotinum* are compared with agamosperous intermediates dominating the *Taraxacum* flora in southern Ukraine and Crimea (Jan Stepánek & Jan Kirschner).

#### 6. The genus *Rubus* in the Czech Republic

Josef Holub, head of the research section at the Institute, has been studying the taxonomy, variation and distribution of the C. European *Rubus* species for many years. A monographic study of the group in Czech Republic should form a part of the Flora (see above).

Mycology has been an important field of the Department's research until Vera Holubová-Jechová untimely passed away recently. Lichenology is represented in the Department by Antonín Vezda.

#### Recent publications:

- Holub J., 1991: Eight new *Rubus* species described from the Czech republic. *Folia Geobot. Phytotax.* 26, 331-340.
- Holub J., 1992: A preliminary checklist of *Rubus* species occurring in the Czech Republic. *Preslia* 64, 97-132.
- Kirschner J., 1993: Karyological differentiation of *Luzula* sect. *Luzula* in Europe. *Thaiszia* 2, 11-39.
- Kirschner J., 1992: A *Luzula* sect. *Luzula* puzzle near Sofia, Bulgaria. A biodiversity contribution. *Ann. Bot. Fenn.* 29, 235-241.
- Kirschner J., 1991: An account of natural hybridization within *Luzula* sect. *Luzula* (Juncaceae) in Europe. *Preslia* 63, 81-112.
- Krahulcová A., 1988-1991: Selected chromosome counts of the Czechoslovak flora I-III. *Folia Geobot. Phytotax.* 23, 375-381; 25, 381-388; 26, 361-366.
- Krahulcová A. & Jarolímová V., 1991: Relationship between *Pinguicula bohemica* Krajina and *Pinguicula vulgaris* L. (Lentibulariaceae) from the karyological point of view. *Preslia* 63, 323-328.
- Mesíček J. & Soják J., 1992: Chromosome numbers of Mongolian Angiosperms. I. *Preslia* 64, 193-206.
- Mesíček J. & Jarolímová V., 1993: List of chromosome numbers of the Czech vascular plants (1945-1985). *Academia Publ., Praha.*
- Nijs den J.C.M., Kirschner J., Stepánek J. & Van der Hulst A., 1990: Distribution of diploid sexual plants of *Taraxacum* sect. *Ruderalia* in east-central Europe. *Pl. Syst. Evol.* 170, 71-84.
- Slavík B., 1990: Phytocartographical syntheses of the Czech Republic. Vol. 2. *BUCSAV, Pruhonice.*
- Slavík B. & Hejny S. (eds.), 1992: *Kvetena České republiky. Vol. 3. [Flora of the Czech Republic 3, Brassicaceae to Malaceae]. Academia Publ., Praha.*
- Tomšovic P. & Krahulcová A., 1991: *Polycnemum majus* (Chenopodiaceae) - a disappearing species in Czechoslovakia: its taxonomy, distribution and karyology. *Folia Geobot. Phytotax.* 26, 341-347.



## 7. IOPB Symposium 1995 - News from the Organizing Committee

Writes Bengt E. Jonsell, IOPB Vice-President/President Elect:

The Organizing Committee is currently preparing the First Circular on the IOPB Symposium 1995, to be distributed in January 1994. Here some excerpts:

6th Intern. IOPB Symposium "**Variation and Evolution in Arctic and Alpine Plants**" will be held from July 29, 1995 in the morning through August 2, 1995 at the University of Tromsø, Norway (69°40' N) in cooperation with the Bergius Foundation of the Swedish Academy of Science, Stockholm, and the Botanical Garden and Museum, University of Oslo.

The Symposium will include eight non-concurrent sessions as well as concurrent poster sessions. The tentative session profiles:

1. Arctic and alpine environment and its biodiversity
2. Reproductive strategies of arctic and alpine plants
3. Demography of arctic and alpine plants
4. Growth patterns and eco-physiological constraints above the timberline
5. Seed biology at high altitudes and latitudes
6. Current molecular approaches and their application in population genetics
7. Speciation and taxonomic differentiation in arctic and alpine floras
8. The Arctic and Alpine under global change

Any person interested in plant biology and biosystematics is welcome. Mail concerning general Symposium matters, invitations, etc. should be addressed to:

Vith IOPB Symposium The Bergius Foundation, P. O. Box 50017 S-10405 Stockholm, Sweden FAX 46-8-612-9005
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### Registration fees:

IOPB Members in good standing for 1992-1994	Norwegian Crowns 650.- (= ca. 48.- US\$)
Non-members	Norwegian Crowns 950.- (= ca. 70.- US\$)
Graduate students (M. Sc.)	Norwegian Crowns 300.- (= ca. 22.- US\$)

### Field trips and approximate prices:

- (a) Pre-Symposium trip to Svalbard, Spitsbergen (ca. 78° N), Norwegian Crowns 4,000.- (=ca.300 US\$). July 26 through July 28, 1995 incl. flight from Tromsø and back, local transport, accomodation and meals.
- (b) Post-Symposium trip to Abisko, Swedish Lapland (ca.68° N) August 3 through August 6, 1995. Norwegian Crowns 2,000.- (US\$ ca. 150) incl. bus transport from Tromsø and back, accomodation, and meals.

The number of participants will be restricted to 50 persons on each trip following the "first come, first served" system. One-day field trip on July 31 in the mountains near Tromsø will cause no extra costs for the Symposium participants. More details will be given in the First, and in the Second Circular.

**The Editor's comment: WOW!!!**

\* \* \*



## 8. About the book on IOPB Symposium 1993

Writes Peter C. Hoch, Missouri Botanical Garden, St. Louis, MO 63166-0299 USA:

I am embarrassed to say that the IOPB Symposium 1993 volume is not yet out and probably will not be until April 1994 or thereabouts. I have most but not all final copies of manuscripts, and am now working on their formatting and consistency. It will take about four months from the time I finish to get the final printed product, assuming that the authors return promptly the page proofs. Most of the delay is unfortunately due to exceedingly slow responses from some authors.

\* \* \*

## 9. Meetings, Past and Future

**IBC Post-Congress Intern. Symposium "Maintenance Mechanism and Diversity of Plant Species Populations"**, Kyoto, September 5-7, 1993.

Report by Shoichi Kawano, IOPB Past President, Dept of Botany, Kyoto University, Sakyo-ku, Kyoto 606-01, Japan

The Kyoto Symposium was a satellite symposium of Intern. Botanical Congress 1993 held in Yokohama. It was organized and sponsored by the Society for the Study of Species Biology and Center for Ecological Research, Kyoto University. Guest speakers included sixteen of the world's leading plant biologists representing seven different countries. The objectives of the Symposium were to bring these scientists together, to present significant new findings in population biology, and to discuss current issues in plant population biology and community ecology. A new wave of research in plant population biology and evolutionary ecology since the 1970s has had a great impact on these research branches, and in this connection the Symposium served as an important forum for exchanging new information and ideas.

In the Symposium's first session, various topics related to "Plant Population Structure and Reproductive Processes" were introduced and discussed. The second session: "Population Interactions and Organization of Plant Communities" included numerous recent and interesting findings as well as theoretical considerations. The diverse backgrounds of the speakers allowed a range of perspectives, from theoretical modelling and population projections to presentation of long-term studies in plant populations. Studies areas ranged from tropical to temperate systems, the study objects - from annual herbs to long-lived trees.

Three presentations dealt with the driving evolutionary processes leading to diversity considered from quite different perspectives. The compelling evidence of genetic drift in natural populations and of single allele changes leading to speciation was presented by Spencer

Barrett. Fakhri Bazzaz demonstrated a unique phenotypic plasticity in a species of *Polygonum* over a range of environmental conditions suggesting that - at least for this species - the cost of maintenance of plasticity as a counter to natural selection was not great. Steven Kelly presented a stimulating case history in which he attributed greater fitness of sexual offspring vs. asexual offspring in *Anthoxanthum* at least in part, to greater resistance against pathogen attacks, esp. viruses demonstrated by sexual offspring.

Several participants examined maintenance of populations in various species. Dennis Whigham presented a study of dynamics of a shade-tolerant perennial woodland herb *Cynoglossum virginianum* which showed the importance of frequent regular monitoring and long-term studies in understanding plant population dynamics. Naoki Kachi presented a study of an even longer-lived species, a tree in Malaysian lowland rain forest which suffers very high levels of seed predation and seedling mortality at its earliest life-history phases but, once established, appears to be highly successful in a range of conditions.

Some papers presented dealt with population biology of clonal plants. Mike Hutchings demonstrated differential responses of a clonal herb to patch quality encountered by ramets, and Hans de Kroon showed that self-thinning can occur in tropical riparian grass without the constraint of maximum size shown in similar studies on temperate plants. Jonathan Silvertown provided a synthetic overview of demographic studies in such plants and presented a useful conceptual framework for examining relative performance of species based on the allocation of populations to growth, fecundity, and stasis.

Competition as a mechanism in population diversity, both within and amongst species, provided an ongoing point of debate throughout the Symposium. Toshihiko Hara presented a theoretical framework for examining relative effects of competition in plant populations. He believes that they are most relevant in species which invest in a rapid height growth, whereas differences in growth rates account for diversity in communities where most species invest in diameter growth. In another model, Dan Cohen contrasted performance of annuals without seed banks with that of perennials: maximum competition occurs amongst perennials at the establishment phase in the "specialists" whereas the annuals without seed banks are "generalists" mostly dependent on relative fecundity. As far as the field experiments are concerned, Greg Cheplick believed that he had found evidence of density-dependent sibling competition in a temperate grass species. Andrew Watkinson presented results from several studies which strongly suggested that the intrinsic rate of increase of a species could explain its relative performance and, surprisingly, that the effects of competition as well as herbivory and pathogens could be negligible. Les Firbank obtained similar results in examining interactions amongst arable weed species, and emphasized the importance of spatial scale in any experiment designed for competition study. Richard Law found little evidence of competition in a chalk grassland, and assumed that most explanation of year-to-year variation in this community could be explained by environmental effects. The latter subject was taken up by two other participants: Larry Venable examined population dynamics of numerous desert annuals and found that reproductive and germination success of some but not all species was a function of environmental variation. The mechanism of predictive germination was raised particularly for less common species as a means by



which these species avoid competition with more common taxa. Peter Chesson presented a model showing the relative effects of different rates of environmental change on plant populations and species coexistence, which also demonstrated how populations may track an equilibrium dictated partly by mechanisms dependent on environmental fluctuations and partly by others which are not.

All this new information, empirical and theoretical alike, together with stimulating discussions that took place during the Kyoto Symposium will greatly contribute to further development of research in plant population biology, community ecology, and evolutionary ecology. All the papers presented during the Symposium will be published in the special issue of *Plant Species Biology* (Vol. 8, Nos 2-3, 1993), about to appear.

\* \* \*

**The First International *Lotus* Symposium** will be held from March 22 through March 24, 1994, at Missouri Botanical Gardens, St. Louis, Missouri. Amongst the important topics to be explored are:

1. Taxonomy and Phylogeny
2. Collection, Documentation and Evaluation
3. Reproduction and Seed production
4. Traditional and Molecular Genetics
5. Agronomic Management and Use
6. Carbohydrate and Nitrogen Metabolism
7. Special Uses for *Lotus* spp.

**Registration deadline March 10, 1994.** For information, please contact Chairman of the Organizing Committee:

P. R. Beuselinck, USDA-ARS, Columbia, MO 65211, USA, FAX(314) 8821467

\* \* \*

## 10. Notes from our Treasurer

by Hans C. M. den Nijs, IOPB Secretary/Treasurer, Hugo de Vries Lab, University of Amsterdam, Kruislaan 318, NL-1098 SM Amsterdam, The Netherlands

### **Reminder: Pay Your Fees NOW!**

A quick survey through my records of IOPB Membership shows that our Organization counts now some 270 Members from more than 30 countries worldwide. The membership is thus not very large but has the advantage of being surveyable which facilitates contacts and cooperation. So far the positive conclusion. Much less pleasant is the financial situation:

Of the 270 Members mentioned above, only about 115 have paid so far their dues for the current period and I should like to thank them for doing so. However, ca. 150 members still



haven't paid. Should the regular publishing schedule of our Newsletter be kept up, IOPB does need the outstanding total of ca. 5'000.- US\$. We therefore **urgently** ask those who up to now delayed their payment, to fulfill this duty, certainly not very heavy for many of us. As an even more substantial reminder, I mailed a formal invoice to all whom it concerns. You either have received it already, or will soon find it in your mail. Please respond soon to save further time-consuming verifications and reminder mailings. Thanks, and my best wishes for a happy and successful year 1994.

\* \* \*

#### **Membership Fees for 1993-1995**

The personal membership fees for the current period are set at US\$ 33.- or the equivalent of DFL 66.-. Members may pay their fees for two periods at a given time: the fees for the next period 1996-1998 have also been set at US\$ 33.-. A later possible rise of the fees will not be charged to those Members who pay now for this period, too. The total amount for these almost century-transgressing membership period is thus US\$ 66.- or DFL 132.-. Please consider this way of payment as IOPB is still trying to avoid as much banking charges as possible.

Please pay your fees by one of the charge-free or at least relatively cheap ways of money transfer which are as follows:

#### **Dutch Florin payments:**

- Send an **Eurocheque** to J.C.M. den Nijs, amounting to **DFL 66.-** (or DFL 132.- for two membership periods) made payable to J.C.M. den Nijs - IOPB
- or
- Send an **International Postal Money Order**, amounting to **DFL 66.-** (or DFL 132.-, see above) made payable to J.C.M. den Nijs - IOPB
- Eurocheques and Postal Money Orders should be sent to:

<p><b>Hans C.M. den Nijs</b> <b>Hugo de Vries Laboratory</b> <b>University of Amsterdam</b> <b>Kruislaan 318</b> <b>1098 SM Amsterdam, The Netherlands</b></p>
--

#### **US Dollar payments:**

- Send a cheque, made out to **IOPB/9039 - Eshbaugh**, and amounting to **US\$ 33.-** (or US\$ 66.- for two membership periods).
- Cheques should be sent to:

<p><b>W. Hardy Eshbaugh</b> <b>Dept. of Botany, Miami University</b> <b>316, Biological Sciences Building</b> <b>Oxford, Ohio 45056</b> <b>USA</b></p>
--

The membership fee for **INSTITUTIONAL** members is US\$ 40.- (equalling DFL 80.-) for the three-year period.

Postage costs of US\$ 10.- or DFL 20.- are not included and have to be added to the fee.

Thank you very much for your cooperation.

\* \* \*

### **About Sponsoring a Colleague's IOPB Membership**

As I wrote in some previous Newsletter issue, it was decided during the Business Meeting of IOPB at St. Louis that the number of non-paying members has necessarily to be kept limited. On the other hand, it would be very important that as many as possible scientists join the IOPB, to promote the information exchange and to increase the general IOPB status. Hence the idea of sponsoring the IOPB membership as a help to colleagues from the countries which for the time being have difficulties with hard currency payments abroad.

On behalf of the Executive, I am herewith calling IOPB Members able to do so, to take over the IOPB Membership payment for one or more colleagues personally, or to secure the necessary grant of funds from any suitable institution. Perhaps such funds are available in some Western countries.

IOPB Members willing to sponsor candidates from abroad are kindly requested to contact me, writing the name and address of the sponsored person, and indicating **CLEARLY** the name on the corresponding cheque or bank order.

Thank you for your help.

\* \* \*

## **11. Requests for Material and/or Information**

**DOWNIE S. R.**Dr., Dept of Plant Biology, Univ. of Illinois, Urbana, IL 61801 USA would appreciate seeds of Umbelliferae.

**ZHUGE Ren**, Ass. Prof., Southwest Forestry College, P.O.Box 48, Kunming, Yunnan 65224, P.R. China, would appreciate papers referring to the genera *Tilia* and *Evonymus*..

\* \* \*



## 12. Miscellaneous News and Notes

### In memoriam Maria Àngels Cardona i Florit (1940 - 1991)

M. Àngels Cardona was born 1940 in Ferreries (Minorca). She studied biological sciences in Barcelona, where she carried out her Doctoral Thesis, under the direction of Prof. Oriol de Bolòs.

From 1963 to 1984 she taught at the University of Barcelona. From 1984 till the moment of her death, she was Professor at the Autonomous University of Barcelona in Bellaterra. In **IOPB Newsletter**, 11:5-6 (1988), she published the Profile of her Laboratory and her research group.

She started research on plant ecology and soon she moved to the cytogenetics, in which she was initiated by Prof. Juliette Constandriopoulos, from Marseille. She became an expert in plant karyology and cytobiogeography - particularly in insularity problems - , fields in which she was a pioneer in Catalonia and in Iberian countries. She published some 60 papers, the list of which accompanies the obituaries published by Mathez (**Flora Mediterranea**, 3:5-8, 1993) and Vigo (**Collectanea Botanica (Barcelona)**, 22:169-174, 1993).

M. Àngels Cardona served as a Member of the IOPB Council from 1987 to 1989. She was also a member of many other scientific societies. Too, she was actively involved in the development and promotion of her Catalan culture, mainly relating to her native Minorca island.

She was a very cheerful and hard working person. She died at the end of 1991, much too early than her Colleagues and friends would have wished.

May she rest in peace.

\* \* \*

### Change of Address

**Dr. Christian Brochman** moved to: Division of Botany, Dept of Biology, University of Oslo, P. O. Box 1045, Blindern, N-0316 Oslo, Norway.

**Dr. Karl Peter Butler** moved to: Institut für Botanik und Landschaftskunde, Frankfurterstrasse 119b, D-63067 Offenbach am Main, Germany.

\* \* \*

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**Herbert G. R. HURKA**, Institut f. Biologie, Univ. Osnabrück, Barbarastr. 11, D-4500 Osnabrück, Deutschland. Fax: 49-541-969 2870.

**Kunio IWATSUKI**, Bot. Garden, Univ. of Tokyo, 3-7-1 Hakusan, Bunkyo, Tokyo 112, Japan.

**David F. MURRAY**, Museum, Univ. of Alaska, 907 Yukon Drive, Fairbanks, AK 99775-1200 USA. Fax: 1-907-474-5469.

**Herwig TEPPNER**, Institut f. Botanik, Karl-Franzens-Univ, Holteigasse 6, A-8010 Graz, Austria.

**Suzanne I. WARWICK**, Centre for Land and Biological Resources Research, K. W. Neatby Bldg, C.E.F. Ottawa, Ontario K1A 0C6 Canada. Phone: 1-613-996-1665; Fax: 1-613-995-1823.

**Tetsukazu YAHARA**, Dept. of Biology, University of Tokyo, Komaba 3-8-1, Meguro-ku, Tokyo 153, Japan. Phone: 81-3-3485-6043; Fax: 81-3-3485-2904.

\* \* \*

## International Organization of Plant Biosystematists

The International Organization of Plant Biosystematists, founded in 1960, acts on several levels from coordinating and publishing information on biosystematics to organizing international conferences in a triennial time schedule. The IOPB is open to all persons working or interested in biosystematics which is interpreted in a broad sense. The more recent volumes from the conferences held in Zürich (K. M. Urbanska, ed., 1987: Differentiation Patterns in Higher Plants) and Kyoto (S. Kawano, ed., 1990: Biological Approaches and Evolutionary Trends in Plants) give extensive insight in the field IOPB deals with.

The IOPB Newsletter is published twice a year and mailed to all Members. It includes reports on current research, requests for material and information, announcements of meetings, etc. Two permanent features in the Newsletter are "IOPB Chromosome Data" and "News from Molecular Biosystematists", respectively edited by Prof. Dr. Clive A. Stace, Dept of Botany, Univ. of Leicester, Leicester LE1 7RH, England, and Prof. Dr. Dan J. Crawford, Dept of Botany, Ohio State University, Columbus, Ohio 43210-1293 USA. The Newsletter Editor is Prof. Dr. Krystyna M. Urbanska, Geobotanisches Institut ETH, Zurichbergstrasse 38, CH-8044 Zürich, Switzerland. IOPB Members automatically have free publishing right of their data and news.

At present, IOPB Membership is for the three-year period between the Symposia. The next Symposium will be held in Scandinavia in 1995.

IOPB Membership fee for individuals is US\$ 33.- for 1993-1995, institutional Membership fees are set at US\$ 40.- for the same period. Detailed information on the payment system can be found in the Newsletter, and will be provided by the Treasurer upon the receipt of the application form.

Any inquiries about IOPB, Newsletter subscription, Membership etc., as well as the application form should be addressed to the Secretary/Treasurer:

**Dr. Hans C.M. den Nijs**, Hugo de Vries Lab., University of Amsterdam,  
Kruislaan 318, NL-1098 SM Amsterdam, The Netherlands  
Phone: 31-20-525 7660; Fax: 31-20-525 7662

**Please don't send such mail to the Newsletter Editor,  
it delays the procedure!**

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### IOPB - MEMBERSHIP APPLICATION FORM (please print)

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First name, middle initial

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Address

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Date

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Signature





MEMBERSHIP APPLICATION FORM

I hereby declare that I am a resident of the State of California and that I am at least 18 years of age at the time of my application. I understand that my membership is subject to the approval of the Board of Directors and that I must pay the initiation fee and the annual dues in advance. I agree to abide by the bylaws and regulations of the organization and to support its objectives and purposes. I understand that my membership is for a term of one year and that I must renew it annually. I understand that I may be removed from membership if I fail to pay my dues or if I am found to be in violation of the bylaws or regulations. I understand that I may resign my membership at any time by giving written notice to the Secretary. I understand that I may be reinstated if I am removed from membership and I pay the initiation fee and the annual dues in advance. I understand that I may be elected to office if I am a member in good standing for a period of one year. I understand that I may be eligible for membership in the next higher degree if I am a member in good standing for a period of one year. I understand that I may be eligible for membership in the next higher degree if I am a member in good standing for a period of one year. I understand that I may be eligible for membership in the next higher degree if I am a member in good standing for a period of one year.

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## Research News Form

for the International Organization of Plant Biosystematists Newsletter  
(IOPB Newsletter)

Typewritten or in capital letters

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Last name

.....  
First name (Mr., Ms.)

.....  
Title

Address:

Publications during the year\*:

Current projects:

Projects completed:

Projects started:

Requests for research material and information:

**Articles and reports should be attached**

To be sent to Krystyna M. Urbanska, Geobotanisches Institut ETH, Stiftung Rübel,  
Zürichbergstrasse 38, CH-8044 Zürich, Switzerland

\* Please select **three** titles and add the remainder as e.g. "seven further papers".





THE UNIVERSITY OF CHICAGO

Department of Chemistry

Chicago, Illinois

June 15, 1954

Dear Mr. [Name]:

I have your letter of June 10, 1954, regarding the [subject]. I am sorry that I cannot give you a more definite answer at this time, but the [reason] is that the [department] is currently [occupied] with [other projects].

I will be sure to get back to you as soon as possible. In the meantime, if you have any further questions, please do not hesitate to contact me.

Sincerely,  
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