



NEWSLETTER

INTERNATIONAL HUMIC SUBSTANCES SOCIETY

Number 25

Fall 2000/Winter, 2001

MALCOLM FAMILY TO IHSS-10



Mollie Jane Malcolm and family came to Toulouse last July to attend the IHSS-10 where the Ron Malcolm Scholarship and Prize were given to Oliver Kracht. Mollie Jane was accompanied by son Greg, daughter Susan, son-in-law Jay and grandson Christopher, son Jeff, and daughter Janet (see photo). The family participated in the Wednesday field tour, lunch at the Chateau de Garrevaques and visit to Albi for the Toulouse-Lautrec Museum and the Sainte-Cécile Cathedral. They also attended the Conference Dinner at the Domaine des Sables d'Auzun, where Mollie Jane joined IHSS President Fritz Frimmel in conferring the Malcolm Award Certificate and was herself given Ron's IHSS Honorary Member' pin by Ed Clapp. The Malcolm family was able to spend a few days in France before continuing on to England and then home to the US.

Dear friends of humic sciences,

with this news letter – which is the first one in 2001 – I want to send you my warm greetings. The mathematicians have shown convincingly that the new millenium started with the beginning of this year. Let me wish you all the best for that year, the decade, the century and ...

Talking of time scales, we are right in the core of our humic sciences. There is no question that the matter we are dealing with is as old as life on earth. However, a closer look into the molecular structure has shown that there is action and change in the humics despite of all their refractory and recalcitrant character. We have just reached the point where we begin to collect facts for scientifically based answers to the fundamental question: what is refractory? These answers are closely related to a suite of advanced analytical methods and interesting approaches which have become available recently. I hope that tackling those fundamental questions which supply the keys for a better understanding of our environment as basis for life will fascinate you and especially the young scientists.

The IHSS is a fine home for these activities. I happily remember the numerous exciting presentations at our 10th Conference in Toulouse. Numerous participants discussed with great enthusiasm the recent findings in the field. Our Society can be proud of the scholarly spirit of their members. We also had the possibility to honour 10 young scientists with travel awards. For the first time, the Ron-Malcolm-Scholarship was presented in memory of the first President and mentor of our society. All this was possible due to the good structure of our organization. Standard and Reference Samples – the background of IHSS – have become available on a broad scale, and orders come from all over the world. Thanks to the active contributions of our Past President and the whole Board, bylaws and web-pages make the functioning and life of our Society sound and transparent. Many national and international activities of our members contribute to the knowledge of the humic matter and by this to the reputation of our science. Increasing attention is paid to its applied aspects. In short: Science, technology and financial basis are in real good shape. That gives us strength to work on the challenges of the future. The Board decided that the next international meeting will take place in Boston, USA, in 2002. It will be organized by Prof. Geoffrey Davies from the Northeastern University. I want to invite you to participate in that great trade of results and ideas.

Numerous national chapters and their representatives help to distribute this News letter and to intensify regional cooperation. This instrument, however, has shown some weaknesses. Some national chapters are functioning well, others are not. It is the strong intention of the Board to improve that situation. It is of course not easy to develop rules which can be applied world wide, since working conditions, funding possibilities and economic power are so different. Therefore we also need YOUR help! Please let us know if you want to get involved in that important task.

Let me thank all the Board members and the active officials of the national chapters for their enthusiasm and the fine work they have done and all of you for esteemed interest in the Society. And don't forget: Think humics!

Fritz H. Frimmel
President of the IHSS

INTERNATIONAL HUMIC SUBSTANCES SOCIETY BOARD OF DIRECTORS

2001

Past President

Dr. James J. Alberts
Marine Institute
University of Georgia
Sapelo Island
GA 31327, USA
☎ (+) 1 912 485 2221
☎ (+) 1 912 485 2133
jalberts@arches.uga.edu

Secretary

Dr. Teodoro M. (Ted) Miano
Dip. Biologia e Chimica Agro-Forest.
e Ambientale, Univ. di Bari
Via Amendola, 165/A
70126 Bari, Italy
☎ (+) 39 080 544 2857
☎ (+) 39 080 544 2850
miano@agr.uniba.it

Board Position

Dr. Maria de Nobili
Dip. Prod. Vegetale e Tec. Agrarie
Università di Udine
Via delle Scienze 208
33100 Udine, Italy
☎ (+) 39 0432 558644
☎ (+) 39 0432 558603
maria.denobili@dpvta.uniud.it

President

Dr. Fritz H. Frimmel
Engler-Bunte Inst., Ber. Wasserchemie
Universität Karlsruhe
Richard-Willstätter-Allee 5
76131 Karlsruhe, Germany
☎ (+) 49 721 608 2580
☎ (+) 49 721 608 7051
fritz.frimmel@ciw.uni-karlsruhe.de

Treasurer

Dr. C.E. Clapp
Dept. Soil, Water, Climate
University of Minnesota
1991 Upper Buford Circle
St. Paul, MN 55108, USA
☎ (+) 1 612 625 2767
☎ (+) 1 612 625 2208
eclapp@soils.umn.edu

Board Position

Dr. J.-P. Croué
Ecole Sup. d'Ingenieurs de Poitiers
Chimie de l'Eau & l'Environnement
40, Av. du Recteur Pineau
86022 Poitiers Cedex, France
☎ (+) 33 49 45 3915
☎ (+) 33 49 45 3768
croue@campus.univ-poitiers.fr

Vice President

Dr. Yona Chen
Dept. of Soil & Water Sciences
Hebrew University of Jerusalem
P.O. Box 12
76100 Rehovot, Israel
☎ (+) 972 8 9489234
☎ (+) 972 8 9468565
yonachen@agri.huji.ac.il

Chairman, Samples Collection

Dr. Paul R. Bloom
Dept. Soil, Water, Climate
University of Minnesota
1991 Upper Buford Circle
St. Paul, MN 55108, USA
☎ (+) 1 612 625 4711
☎ (+) 1 612 625 2208
pbloom@soils.umn.edu

Honorary Members

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Dr. Ronald L. MALCOLM
Dr. Michael H.B. HAYES
Dr. Egil T. GJESSING

International Humic Substances Society on the World Wide Web

Visit our home page at:

<http://www.ihss.gatech.edu>

Prof. E. M. Perdue coordinates the development of the IHSS WEB page. Progresses toward this goal may be followed at the above WEB site which resides on a server located at the Georgia Institute of Technology, Atlanta, USA.

Suggestions and comments regarding the content and organization of the WEB pages are actively requested from all IHSS members.

E-mail Dr. E. M. Perdue at michael.perdue@eas.gatech.edu for more information.

LIST OF NATIONAL CHAPTERS COORDINATORS

General information. The Board of Directors of the IHSS recently agreed: **a)** to reinforce contacts with national coordinators in order to improve the membership structure; **b)** to reduce the number of very small chapters; and **c)** to hasten the process of updating and completing the general membership list. All chapters **with less than 5 members** are merged into a Rest of the World Chapter. The Secretary, Dr. T.M. Miano, was nominated temporarily as General Coordinator of the R-o-W Chapter. Further, the Board has also unanimously agreed on a 25% increase of membership dues. The additional income will be entirely devoted to enhance funding for the IHSS Travel Bursaries for young scientists. The General Assembly of the IHSS, held during the 9th Meeting of the IHSS, accordingly approved.

Prof. Ramon A. **Rosell**
Univ. Nacional del Sur
Dpto Agronomia - LAHBIS
8000 Bahia Blanca
Argentina
e-mail: rrosell@criba.edu.ar

Dr. Kaye M. **Spark**
CSIRO Land and Water
Private Mail Bag 3
Griffiths, NSW 2680
Australia
☎ +61.2.6960.1575
☎ +61.2.6960.1600
e-mail: Kaye.Spark@grf.clw.csiro.au

Dr. Ladislau **Martin Neto**
EMBRAPA - CNPDIA
Rua XV Novembro, 1452
Caixa Postal 741
13560-970 Sao Carlos, SP - **Brazil**
☎ +55.16.272.2477
☎ +55.16.272.5958
e-mail: martin@cnpdia.embrapa.br

Dr. Ekaterina G. **Filcheva**
N. Pouskarov Institute
Soil Sci. & Yield Programming
5, Shosse Bankya POB 1369
1080 Sofia - **Bulgaria**
☎ +359.2.2.52.71/486
☎ +359.2.248.937
e-mail: filcheva@bgnet.bg

Dr. P.M. **Huang**
Univ. of Saskatchewan
Dept. of Soil Science
51 Campus Drive
S7N 5A8 Saskatoon, SK - **Canada**
☎ +1.306.966.6838
☎ +1.306.966.6881
e-mail: huangp@sask.usask.ca

Dr. Jianming **Xu**
Dept. of Soil and Water Resources
Zhejiang Agricultural University
286 Kaixuan Road
Hangzhou 310029 - **P.R.China**
☎ +86.571.6971151;
☎ +86.571.6049815
e-mail: jxu@public.hz.zj.cn

Prof. Luis Herman **Gonzalez**
Universidad Nacional de Colombia
Apartado aéreo 3840
Medellin
Colombia
☎ +57.4.260.7575
☎ +57.4.260.4489
e-mail: lhgonzal@perseus.unalmed.edu.co

Dr. Elham A. **Ghabbour**
Agricultural Research Center
Soil & Water Research Institute
Bacos, 21616 Alexandria
Egypt
☎ +20.3.570.4443
☎ +20.3.570.4441
e-mail: eghabbou@lynx.neu.edu

Dr. J.-P. **Croué**
Ecole Sup. d'Ingenieurs de Poitiers
Lab. Chimie de l'Eau et Nuisances
40, Av. du Recteur Pineau
86022 Poitiers Cedex - **France**
☎ +33.49.45.3915
☎ +33.49.45.3768
e-mail: croue@campus.univ-poitiers.fr

Dr. Gudrun **Abbt-Braun**
University of Karlsruhe
Dept. of Water Chemistry
Richard Willstätter Allee 5
76131 Karlsruhe - **Germany**
☎ +49.721.608.2580
☎ +49.721.699154
e-mail: gudrun.abbt-braun@ciw.uni-karlsruhe.de

Dr. Etelka **Tombacz**
Attila Jozsef University
Dept. of Colloid Chemistry
Aradi Virtamik tera, 1
H-6720 Szeged - **Hungary**
e-mail: E.Tombacz@chem.u-szeged.hu

Dr. Wisnu **Susetyo**
Freeport Indonesia Company
P.O. Box 2072
Tembagapura 98100
Irian Jaya - **Indonesia**
☎ +62.901.301914
☎ +62.901.301914
e-mail: Wisnu_susetyo@fmi.com

Prof. Michael H.B. **Hayes**
University of Limerick
Chemical and Environmental Sciences
F1-013 Foundation Building
Ireland
☎ +353.61.20.26.31
☎ +353.20.25.72
e-mail: Michael.H.Hayes@ul.ie

Prof. Yona **Chen**
Hebrew Univ. of Jerusalem
Dept. Soil & Water - Agriculture
P.O. Box 12
76100 Rehovot - **Israel**
☎ +972.8.9489234
☎ +972.8.9468565
e-mail: yonachen@agri.huji.ac.il

Prof. Nicola **Senesi**
Università di Bari
Ist. di Chimica Agraria
Via Amendola, 165/A
70126 Bari - **Italy**
☎ +39.080.544.2853
☎ +39.080.544.2813
e-mail: senesi@agr.uniba.it

Prof. Koyo **Yonebayashi**
Kyoto Prefectural Univ.
Dept. of Agricultural Chemistry
Faculty of Agriculture
Shimogamo, Kyoto 606 **Japan**
☎ +81.75.781.3131
☎ +81.75.781.6043 /9365
e-mail: ky_yone@dns.kpu.ac.jp

Dr. Maris **Klavins**
University of Latvia
Raina Blvd. 19
LV-1568 Riga
Latvia
☎ +371.733.1766 /733.2704
☎ +371.7225039
e-mail: mklavins@lanet.lv

Prof. Lenom J. **Cajuste**
Colegio de Postgraduados
Centro de Edafologia
Km. 34 Carr. Mexico-Texcoco
56230 Montecillo - **Mexico**
☎ +52.595.1.0524
☎ +52.595.1.0524
e-mail: etsujac@colpos.colpos.mx

Dr. Georg **Becher**
Norwegian Inst. Water Res. (NIVA)
Brekkeveien 19
P.O.Box 173, Kjelsaas
N-0411 Oslo - **Norway**
☎ +47.2218.5100
☎ +47.2218.5200
e-mail: georg.becher@niva.no

Prof. Jerzy **Drozd**
Agricultural Univ. of Wroclaw
Inst. Soil Sci. Agric. Env. Prot.
Grunwaldzka 53
50-357 Wroclaw - **Poland**
☎ +48.71.205637
☎ +48.71.224849
e-mail: drozd@ozi.ar.wroc.pl

Prof. Armando C. **Duarte**
Universidade de Aveiro
Dept. of Chemistry
Campus Univ. Santiago
3800 Aveiro - **Portugal**
☎ +351.34.370737
☎ +351.34.25143
e-mail: aduarte@dq.ua.pt

Dr. Alexandra **Vasu**
Res. Institute. Soil Science
and Agrochemistry
Bd. Marasti nr. 61
71331 Bucuresti - **Romania**
☎ +40.1.6756482 (home)

Dr. Olga **Iakimenko**
(deputy)
Moscow State University
Dept. of Soil Science
119899 Moscow **Russia**
☎ +7.095.939.4272
☎ +7.095.939.0989
e-mail: iakim@soil.msu.ru

Dr. Gabriela **Barancikova**
Soil Fertility Res. Institute
Research Station - Presov
Reimannova 1
08001 Presov - **Slovakia**
☎ +42.91.731.054
☎ +42.91.723.184
e-mail: bar@vadium.sk

Dr. Asuncion **Roig**
C.S.I.C.
Centro Edafologia y
Biologia Aplic. Segura
4195-30080 Murcia - **Spain**
☎ +34.968.396333
☎ +34.968.396213
e-mail: aroig@natura.cebas.csic.es

Dr. Karl **Ramseyer**
University of Bern
Geologisches Institute
Baltzerstrasse, 1
CH 3012 Bern - **Switzerland**
☎ +41.31.631.8758
☎ +41.31.631.4843
e-mail: kramseyer@geo.unibe.ch

Dr. A.S. **Ball**
University of Essex
Dept of Biological Sciences
Wynenhoe Park
CO43SQ Colchester, England **UK**
☎ +44.1206.87.3332
☎ +44.1206.87.3416
e-mail: andrew@essex.ac.uk

Dr. James A. **Rice**
South Dakota State University
Dept. of Chemistry & Biochemistry
Box 2202
Brookings, SD 57007-0896 - **USA**
☎ +1.605.688.4252
☎ +1.605.688.6364
e-mail: James_Rice@sdsstate.edu

REST OF WORLD CHAPTER

Dr. Ted M. **Miano**, University of Bari, Dip. di Biologia e Chimica Agro-Forestale e Ambientale, Via Amendola, 165/A, 70126 Bari - **Italy**
☎ +39.080.544.2857; ☎ +39.080.544.2813; e-mail: miano@agr.uniba.it

MEMBERSHIP DUES (2001)

Chapter/Country	Regular	Student / Retired
Argentina, Australia-New Zealand, Austria, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, Greece, Indonesia, Ireland, Israel, Italy, Japan, Malaysia, Mexico, Netherlands, Norway, Portugal, South Africa, Spain, Sweden, Switzerland, Taiwan, Turkey, United Kingdom, United States, Venezuela	\$ 25.00	\$ 12.50
Czech R., Developing countries (Africa, Asia, Central & South America), Egypt, Poland, Hungary, Slovakia R., Slovenia	\$ 7.00	\$ 3.00
Bulgaria, China, Latvia, Lithuania, Romania, Russia	\$ 1.00	\$ 1.00

National Coordinators should collect the fees from members of their chapters in local currencies, deduct 20-25 % out of the fees (postage, copying, etc.), and then send the balance in US \$ to the Treasurer, Dr. C.E. Clapp, Univ. Minnesota, St. Paul, MN, USA.

Coordinators from 7\$-group chapters are invited to collect dues for two years (\$14, and save converting to US \$ not so often) and are allowed to keep up to 50% of the fee. Coordinators from 1\$-group chapters can keep the entire fee.

Members of the R-o-W Chapter should send their fees directly *to the Secretary* (in US \$).

IHSS Members are reminded that membership dues are payable at the beginning of each year directly to their National Coordinators.

IHSS VOLUMES (and related publications)

HUMIC SUBSTANCES IN TERRESTRIAL ECOSYSTEMS. (675 pp). Edited by A. Piccolo. Elsevier, 1996. **ISBN 0-444-81516-3**

HUMIC SUBSTANCES IN SOIL AND WATER ENVIRONMENTS. *Characterization, Transformations and Interactions*. Proceedings 7th Int. Meeting of the IHSS. St. Augustine, Trinidad, 1994. 1996 (493 pp). Edited by C.E. Clapp, M.H.B. Hayes, N. Senesi, and S.M. Griffith and published by IHSS. **ISBN 1-889365-00-9**

THE ROLE OF HUMIC SUBSTANCES IN THE ECOSYSTEMS AND IN ENVIRONMENTAL PROTECTION. Selected Papers of the 8th Int. Meeting of the IHSS. Wroclaw, Poland, 1996. (1002 pp.). Edited by J. Drozd, S. Gonet, N. Senesi, and J. Weber. PTSH & Polish Chapter of IHSS, Wroclaw, 1997. **ISBN 83-906403-2-5**

HUMIC SUBSTANCES, PEATS AND SLUDGES: Health and Environmental Aspects. Edited by M.H.B. Hayes & W.S. Wilson. The Royal Society of Chemistry, Cambridge, 1997. Special Discount Price £38.68 (\$72.80). **ISBN 0-85404-699-2**

UNDERSTANDING HUMIC SUBSTANCES: ADVANCED METHODS, PROPERTIES and APPLICATIONS (286 pp.). Edited by E. Ghabbour and G. Davies, Royal Society of Chemistry, Cambridge, England, 1999. **ISBN 0-85404-799-9**

HUMIC SUBSTANCES: VERSATILE COMPONENTS OF PLANTS, SOILS AND WATER (341 PP.) Ed. by E. Ghabbour and G. Davies, Royal Society of Chemistry, Cambridge, England, 2000. **ISBN 0-85404-855-3**

CARBON AND NITROGEN DYNAMICS IN FLOODED SOILS. Proceedings of the workshop on Carbon and Nitrogen Dynamics in Flooded Soils, 1999 (188 pp.). Edited by G.J.D. Kirk and D.C. Olk, International Rice Research Institute, Los Banos, Philippines, 2000. **ISBN 971-22-0140-6**

IHSS NOMINATING COMMITTEE

Prof. Fritz Frimmel, President of the IHSS, appoints new members for the Nominating Committee. According to the Bylaws the Nominating Committee should be comprised of "at least three (3) members" "with the duty of soliciting nominations from the membership, considering all suggested nominees for elective offices and positions to be filled for the succeeding calendar year. The Nominating Committee shall submit the names of at least two (2) nominees for each office to be filled to the Secretary" And, "Nomination Committee". "The term of office for committee members shall expire with the term of the President who appointed them".

Members appointed are: **Dr. Gregory Korshin** (*Chair*), Department of Civil Engineering, University of Washington, Seattle, USA; **Dr. Paolo Sequi**, Research Institute for Plant Nutrition, Ministry of Agriculture and Forestry, Rome, Italy; **Dr. Gerd Gleixner**, Lehr. Allgemeine Chemie und Biochemie, Technische Universität München, Freising, Germany.

IHSS STANDARD AND REFERENCE COLLECTION

By Paul Bloom

Sales for 2000

Sales of reference and standard samples continue to be strong. In 2000 we filled 182 orders, which was up from 154 in 1999. Samples were shipped to 24 countries; 111 to the United States, 20 to Canada, and the remainder were scattered among 22 other countries.

Aquatic samples accounted for more than 2/3 of the sales and soil and Leonardite samples accounted for slightly less than 1/3 of the sales. The new Suwannee River NOM sample was very popular. Sixty-four orders included purchases of the NOM.

Our current total reserve of Suwannee River HA Standard is only 23.9 g, which at current sales should last us about 3 years. When this reserve is exhausted it will be replaced by HA separated from our NOM sample.

Purchases can now be made with credit cards.

Humic samples can be purchased from IHSS using VISA, Master Card or American Express cards. See the IHSS web site at www.ihss.gatech.edu.

Current prices

Sample No.	Description	Quantity	Price(\$US)
1S101H	Suwannee River Humic Acid Standard	100 mg	\$175
1S101F	Suwannee River Fulvic Acid Standard	100 mg	\$125
1S102H	Soil Humic Acid Standard	100 mg	\$15
2S102F	Soil Fulvic Acid Standard II	100 mg	\$150
1S103H	Peat Humic Acid Standard	100 mg	\$ 15
1S103F	Peat Fulvic Acid Standard	100 mg	\$150
1S104H	Leonardite Humic Acid Standard	100 mg	\$ 5
1S104H-5	Leonardite Humic Acid Standard	5g	\$100 x
1R101F	Suwannee River Fulvic Acid Reference	100 mg	\$ 75
1R103H	Peat Humic Acid Reference	100 mg	\$ 10
1R105H	Nordic Aquatic Humic Acid Reference	100 mg	\$125
1R105F	Nordic Aquatic Fulvic Acid Reference	100 mg	\$100
1R106H	Summit Hill Soil Humic Acid Reference	100 mg	\$ 25
1N101	Suwannee River NOM (RO isolation)	100 mg	\$20
BS102M	Elliott Silt Loam Soil	500 g	\$50
BS103P	Pahoekoe Peat Soil	500 g	\$50
BS104L	Gascoyne Leonardite	500 g	\$50
P89101N	Thorn et al., NMR data (North America)	free	\$5.00
P89101W	Thorn et al., NMR data (rest of the world)	free	\$10.00

IHSS TRAVEL BURSARIES AWARDEES (IHSS 10)

Ten Travel Bursaries providing partial support to young researchers and students for attendance at the 10th Meeting of the IHSS in Toulouse, France, have been assigned by an "ad hoc" Committee of the IHSS in year 2000. The Chairman of the Committee, Dr. Fritz Frimmel, received a total of 14 applications within the deadline of April 15, 2000. In addition, and for the first time in Society's history, the best paper presented among them was also conferred the **Malcolm Award Certificate** by the President of IHSS, Dr. Fritz Frimmel.

IHSS Bursary Awardees 2000

Oliver Kracht , <i>Germany</i> * Malcolm Award Certificate	"Isotope analysis of pyrolysis products from Sphagnum peat and dissolved organic matter from bog water"
Judith Nyiraneza , <i>Rwanda</i>	"The determination of the molecular weights distribution of humic substances by HPLC-SEC and capillary electrophoresis: A comparison of results"
Linn Persson , <i>Sweden</i>	"On-line size-exclusion chromatography/electrospray ionisation mass spectrometry of aquatic humic and fulvic acids"
Cécile Quantin , <i>France</i>	"Influence of soil organic matter on trace elements mobilization by ferri-reducing bacteria in a New Caledonian oxisol"
André Henrique Rosa , <i>Brazil</i>	"A new application of humic substances: Activation of supports for immobilization of invertase"
Declan Warwick Page , <i>Australia</i>	"Coagulating allochthonous dissolved organic matter"
Daniel Schmitt , <i>Germany</i>	"Metal distribution in different size fractions of natural organic matter"
Chung-Ming Lin , <i>USA</i>	"Reduced sulfur in humic acid and soil organic matter and the strong retention of mercury"
Irina V. Dianova , <i>Russia</i>	"Formation of organochlorine compounds during aquatic chlorination of the phenolic fragments of humic matter"
Etelvino H. Novotny , <i>Brazil</i>	"Factors affecting humic substances organic free radical analysis by EPR"

AWARDS

Professor **Nicola Senesi**, former President of IHSS, has been conferred the title of Doctor Honoris Causa from the Institut National Polytechnique de Toulouse (INPT), France. The Honor was awarded to Dr. Senesi by the President of INPT during an official ceremony held on May 18, 2000, at the Ecole National Supérieure Agronomique de Toulouse (ENSAT). Dr. Senesi is Professor of Soil Chemistry at the University of Bari, Italy and is Fellow of the Soil Science Society of America (SSSA) and American Society of Agronomy (ASA), and was awarded the Golden Distinction of the Polish Soil Science Society in 1996. Dr. Senesi is an Associate Editor of Soil Science, European Journal of Soil Science, Geoderma, Journal of Environmental Science and Health, and Humic Substances in the Environment. Dr. Senesi is author of about 230 technical and scientific papers, reviews and book chapters, and co-editor of 6 books.

PROPOSED IHSS TRAVEL BURSARY GUIDELINES

1. Travel bursaries will be given only to students. Investigators who have completed their Ph.D. degrees are not be eligible for bursary awards.
2. A committee consisting of the IHSS President and at least two other IHSS members appointed by the IHSS President will evaluate applications for travel bursary awards.
3. The deadline for receipt of the applications is four months prior to the IHSS International Meeting with evaluations and notifications of awards given to the applicants 3 months prior to the IHSS International Meeting.
4. Applications should consist of 3 copies each of a letter of application, recent curriculum vitae, letter of support from the applicant's major professor and manuscript of the paper to be presented.
5. The number and amount of the awards will be determined by the President in consultation with the Treasurer and members of the travel bursary selection committee.
6. Travel bursary award recipients will be honored at the conference banquet with their cash award and a certificate acknowledging their status as an award winner.
7. Malcolm Award - in the judgment of the travel bursary selection committee, the top applicant for a travel bursary award will be designated the Malcolm Award winner. This individual will be recognized with a certificate and cash award of 250 US\$ in addition to the normal travel bursary in recognition of their achievement.

PROPOSED IHSS BYLAWS CHANGE 2001

To allow for Society officials to conduct Society business more effectively, it is suggested that the restriction on consecutive terms for officers be extended from one consecutive term to two. This change will allow more continuity on the Board, but will not change the total amount of time that a single person may serve on the Board.

These are the proposed changes to the Bylaws. Members will be asked to vote on it in the upcoming election.

ARTICLE V. OFFICERS AND DUTIES

Current wording:

Section 4. An officer, except the President and the Vice President/President Elect, may hold the same office for no more than one (1) additional consecutive term. No officer may serve more than twelve (12) consecutive years on the Board of Directors.

Proposed change:

Section 4. An officer, except the President and the Vice President/President Elect, may hold the same office for no more than two (2) additional consecutive term. No officer may serve more than twelve (12) consecutive years on the Board of Directors.

MEETINGS

8th Nordic IHSS Symposium on “*Humic Substances Characterisation, Dynamics, Transport and Effects*”, Frederiksberg C, Denmark, May 28-30, **2001**. Second announcement. The application form has to be filled in and submitted definitely before 1st March 2001. The symposium fee is 1500 Danish cronens (DKK). The fee covers all papers and paper work, lunch and coffee during the symposium, excursion to northern Sealand and symposium dinner (hopefully in Tivoli). Deadline for paying symposium fee is 1st March 2001 and guidelines for the payment will be distributed to all who has submitted the registration form.

Organising Committee: Ole K. Borggaard, Peter E. Holm, Anne Louise Gimsing, Birgitte Raben-Lange, Lars Holm Rasmussen, Bjarne W. Strobel. Chemistry Department, The Royal Veterinary and Agricultural University, Thorvaldsensvej 40, DK-1871 Frederiksberg C, Denmark. E-mail: nordic-ihss@kvl.dk; Fax: +4535282398; Web-site: <http://www.kemi.kvl.dk/nordic-ihss>.

15th International Symposium on Environmental Biogeochemistry (ISEB15), “*Biogeochemical Processes and Cycling of Elements in the Environment*”. All information are available at website <http://www.ar.wroc.pl/~weber/iseb15.htm>.

International Humic Substances Society 20th Anniversary Conference, “*Humic Substances – Nature’s Most Versatile Materials*”, Northeastern University, Boston, MA, USA, July 21-26, **2002**. Call for papers. You are cordially invited to participate in the 20th Anniversary Conference of the International Humic Substances Society, to be held at Northeastern University in Boston, Massachusetts, USA from Sunday July 21 to Friday July 26, 2002. The Biennial IHSS Conference returns with joy to the United States 20 years after the First Conference at Estes Park, Colorado in 1983. Previous Conferences were held in Birmingham (England), Oslo (Norway), Matalascanas Beach (Spain), Nagoya (Japan), Monopoli (Italy), St. Augustine (Trinidad & Tobago), Wroclaw (Poland), Adelaide (Australia) and Toulouse (France). **Important Deadlines: November 30, 2001** Early Registration payment; **December 31, 2001** Extended Abstracts receipt; **February 28, 2002** Acceptance of Extended Abstracts; **March 31, 2002** Advanced Registration payment; **April 30, 2002** Final Program published; **May 31, 2002** Late Registration payment.

Contact for first Announcement: Dr. E. Ghabbour, Barnett Institute, 341 Mugar Hall, Northeastern University, Boston MA 02115, USA, Phone: (Int.+) (617) 373-7988, Fax:(Int.+) (617) 373-2855, E-mail: e.ghabbour@neu.edu, Web www.hagroup.neu.edu.

Humic Substances Seminar VI, Boston, MA, USA, July 27, **2002**. Call for Papers. Humic Substances Seminar VI will be held at Northeastern University, July 27, 2002 immediately following the IHSS11 Conferences at Northeastern University. The Honorary Chair is Dr. M. De Nobili of the University of Udine. Registration & abstracts deadline is Dec. 30, 2001, www.hagroup.neu.edu.

PAST MEETINGS

10th International Meeting of the International Humic Substances Society

by Dr. Jean Philippe Croué

The 10th International Meeting of the International Humic Substances Society *Entering the Third Millenium with a common approach to Humic Substances and Organic Matter in Water, Soil and Sediments* was held in Toulouse (la ville rose “Pink City”) in July 2000 (24-28 July 2000). The IHSS10, organized by the french chapter of the IHSS in collaboration with the Ecole Nationale Supérieure d’Agronomie de Toulouse (ENSAT), took place at the University of Toulouse. About 330 scientists coming from all over the world (figure 1) participated at the conference. The scientific committee received more than 300 extended abstracts (figure 2) from which 47 were selected for oral presentations including 5 presentations given by young scientists who received a travel bursary to attend the meeting. Five invited speakers introduced the major oral sessions. Four and a half days were dedicated to the scientific program which included four large poster sessions during when 253 posters were presented. The scientific program was divided into 7 topics: *Origins and Characterization; Interactions with Organic Substances; Interactions with Metal Ion and Mineral Surfaces; Biogeochemical Cycles; Interactions with Plants; Commercial and Industrial Application and Novel Analytical Developments for the Characterization of Humic Substances*.

On Wednesday, the good time to relax, the participants were invited for an outside lunch in the country side of Toulouse in the park of a typical south west “Maison Bourgeoise” (small castle). The afternoon was dedicated to the visit of Albi, an old and typical south west city with its beautiful church (organ concert) and

the visit of the Toulouse Lautrec gallery. The dinner was taken in the suburb of Toulouse during when the President of the IHSS, Professor Fritz Frimmel, awarded 10 travel bursaries to young scientists with a special award "The Ronald Malcolm Award" in the presence of the family of Ron Malcolm, his wife, Mollie and his sons and daughters.

The proceedings of the conference made of two large books (up to 1300 pages) containing all the extended abstracts that were presented at the conference (both oral and poster presentations) were distributed to the participants at the beginning of the conference. For those who could not attend the 10th IHSS meeting the proceedings can be purchased from PROGEP (progep@enigct.fr).

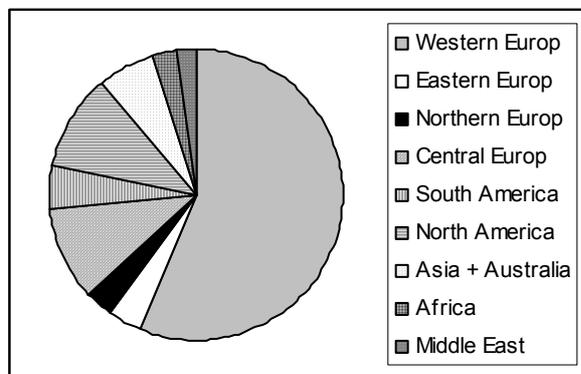


Figure 1: Participants

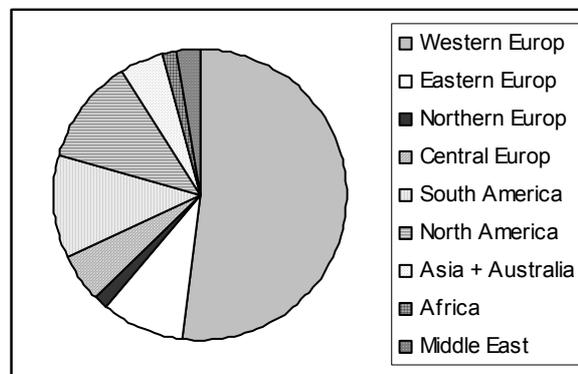


Figure 2 : Abstracts received

ROSE II

by Dr. Gudrun Abbt-Braun

The symposium on "Refractory Organic Substances in the Environment (ROSE II)" was held from August 1–3, 2000 at the Universität Karlsruhe, Germany. It was the second conference devoted to that topic. Since 1994 the German Science Foundation (Deutsche Forschungsgemeinschaft, DFG) has funded a research program (ROSIG: Refraktäre Organische Säuren im Gewässer) dealing with refractory matter in aquatic systems. The research program focused upon the characterization of refractory organic material from brown water, soil seepage water, groundwater, and treated waste water. The compilation of analytical and biochemical data lead to information on the genesis and transformation of the isolated material and its interaction with other water constituents. In the course of this program reference substances have been isolated and made available. The program started in 1994 with 5 projects. In 1997 and 1998 up to 25 projects from University institutes and other research centers all over Germany were involved. The symposium in Karlsruhe marked the end of this research program.

The meeting offered the opportunity to present some of the most interesting findings and to discuss them on an international scale with other experts in the field of humic sciences. The scientific program included topics like analytical, physical-chemical and ecological aspects. Over 120 researches coming from universities and research institutions of 15 countries attended the conference. The papers were presented as keynote lectures (10), oral presentations (23), and posters(50).

The oral session included several topics:

Analytical Aspects, keynote lecture given by: **M. Spittler**, University Dortmund, Germany (Soft Ionization Mass Spectrometry of Humic Substances); **S. Cabanis**, Kent State University USA (Reversed Phase HPLC Studies of Natural Organic Matter); **H. Lüdemann**, University Regensburg (NMR studies of Refractory Organic Substances); **G. Abbt-Braun**, University Karlsruhe (Chemical, Physical and Spectroscopic Data of the Rose Reference Samples – Comparison and Evaluation).

Physical-Chemical Aspects, keynote lectures given by: **F.-D. Kopinke**, UFZ Leipzig, Halle, Germany (Sorption and Chemical Reactions of PAHs with dissolved Humic Substances and Related Model Polymers); **G. V. Korshin**, University of Washington (Quantification of pH and Halogenation Effects by Differential Spectroscopy and Exploration of the Nature of Reactive Sites).

Ecological Aspects, keynote lectures presented by: **R.G. Wetzel**, University of Alabama (Origin and Fates of Natural Compounds in Natural Waters: Importance of Photodegradation); **Y. Chen**, Hebrew University, Jerusalem, Israel (The Biological Activity of Humic Substances: Effects and Mechanisms); **G. Guggenberger**, University Bayreuth, Germany (Nutrients Bound to Non-Humic and Refractory Organic Substances in Forest Soils); **J. D. Coates**, Southern Illinois University, USA (The Biogeochemistry of Microbial Humic Substances Reduction).

The Poster discussion was chaired by John Coates and Jim Alberts.

A Poster Award was given to: **Dr. G. Gleixner** (coauthor: J. Rothe, Z. Filip, H. Claus, T. Koch, A. Nehrkorn): Microbial Transformation of Natural Organic Substances; **G. Marx** (coauthor: K. G. Heumann): Mass Spectrometric Isotope Dilution Technique for the Determination of Sulfur in Humic Substances and their separated Fractions by Chromatographic Methods; **Dr. Th. Rabung** (coauthor H. Geckeis, T. N. Manh, J.-I. Kim, H.-P. Beck): Kinetic Aspects of Metals Ion Binding to Humic Substances.

As Vice President of the Universität Karlsruhe, Fritz Frimmel pointed out in his welcoming address, that the University is the oldest technical University of Germany celebrating its 175th anniversary. The conference was part of the anniversary celebrations. The Polytechnical School in Karlsruhe was founded on October 7th 1825, based on the model of the École Polytechnique in Paris. In 1865, it was granted a university charta and the right to confer doctoral degrees. The name "Fridericiana" was derived from the founder, Count Friedrich of Baden, in 1902, and in 1885 the official name changed to Technological University and finally, in 1967, to Universität Karlsruhe. As President of IHSS, Fritz Frimmel pointed out the importance of humic substances for life. He welcomed the participants and wished them a successful meeting.

An abstract book of the ROSE II Symposium is available and can be purchased directly at the Engler-Bunte-Institut. Please contact Dr. G. Abbt-Braun (gudrun.abbt-braun@ciw.uni-karlsruhe.de, charge 25,- DM, additional forwarding expenses).

International symposium on "New horizons in the study of the C cycle", ANPA

by *Maria De Nobili*

An international symposium on "New horizons in the study of the C cycle", organised by the ANPA (Italian Environmental Protection Agency), was held in Rome last October. The works focused on global carbon cycling as a key scientific issue for understanding the immobilisation-release equilibria, that, on planetary scale, affect the concentration of carbon containing green house gases in the atmosphere. The symposium, that featured outstanding experts from Europe, North America and Australia, was not merely a scientific event. It had been sponsored by the Italian ministries of the Environment, Agriculture and Community Policies and was meant to compile, at the conclusion of the works, a lists of suggestions for government actions regarding priority areas for further investigation and possible policies to increase carbon sequestration in terrestrial ecosystems.

Hugues Faure of the INQUA (International Union of Quaternary Research- Carbon Commission) pointed out in his introduction to new horizons to carbon research that the carbon cycle is a complex system, constantly adapting itself, on a long time scale, to climatic changes and there is therefore need for improved integrated knowledge. J.L. Probst from Toulouse university, spoke of the role of continental erosion and river transport and said, among other things, that two thirds of the carbon released into rivers is oxidised to CO₂ during transport to the oceans. The contribution of geological carbon erosion to carbon emissions is not very well known and the DOC and POC fluxes depend on soil carbon content and river sediment transport. Yang Wang of the Florida State University talked about uncertainties derived from incomplete understanding of the soil carbon dynamics and novel prospects in the investigation of the soil carbon cycle given by isotopic approaches and pointed out the need of further research in this field.

The symposium was of a high scientific standard. Nevertheless, humic substances, the most important long term form of carbon sequestration, second only to carbonate in deep ocean water and sediments, were not even considered in the issue. E. V. Ponomarenko from the Canadian Museum of Civilisation of Ottawa came even out with the astonishing statement that humic substances do not exist: "25 to 45 % of C being char in grassland soils". Many of you probably remember that someone else, some time ago, with saying that humic substances do not exist, but that made by professor Oades of CSIRO was an ironic provocation, of a much different level. It would not even be worth discussing Ponomarenko's opinion, but the fact that what she said was accepted, apparently without scandal by the large majority of C cycling experts, shows how little is the importance of humic substances understood in the general scientific community.

Again this is not merely a scientific issue, but an important one in influencing future research funding policies by governments. The failure of the last world conference on global warming to find an agreement on industrial regulations is going, sooner or later, to increase the "political" importance of carbon sequestration in soil. This represents a big opportunity that cannot be missed. It is important that humicists find a way to increase the awareness of other scientists on the importance of humic substances and the society is the principal and better qualified agent for the purpose. Suggestions about how the action of the Society could be improved are welcome, but also individual actions are useful and necessary.

Humic Substances Seminar V

by Elham Ghabbour and Geoffrey Davies

Humic Substances Seminar V was dedicated to Patrick MacCarthy, Professor of Chemistry and Geochemistry at the Colorado School of Mines and a co-founder of IHSS. The Honorary Chair was C. Edward Clapp, USDA-ARS and the University of Minnesota, and the Honored Guest was Morris Schnitzer. Also very welcome were Robert Wershaw (USGS, Denver), who prompted and was Honorary Chair of HSs Seminar I in 1997, Fritz Frimmel (President, IHSS) and Donald Sparks (Immediate Past President, Soil Science Society of America). The Honorary Chairs of Seminars II (Wolfgang Ziechmann), III (Cornelius Steelink) and IV (Michael Hayes) were recognized. Also participating were IHSS President-Elect Yona Chen, Past Presidents James Alberts, Russell Christman, Michael Hayes and Nicola Senesi, IHSS Treasurer C. Edward Clapp, Board Member Maria De Nobili and the IHSS Coordinators of Canada, Egypt, Ireland, Israel, Italy and USA (Ming Huang, Elham Ghabbour, Michael Hayes, Yona Chen, Nicola Senesi and James Rice).



Industrial interest in the Seminars is growing. The Abstract Book of Seminar V contained advertisements from following organizations: Arcotech, Inc. (Chantilly, VA, D. Walia), Actagro LLC (Biola, CA, F. Shanahan), Cropmaster^R-UAS of America, Inc. (Hudson, FL, M. Pecsenska), Horizon Ag-Products, Inc. (Kennewick, WA, D. King), Luscar Ltd. (Edmonton, Canada, D. Ozdoba), Micromass UK Ltd. (Manchester, D. Churchman) and The Royal Society of Chemistry (Cambridge, UK, R. Andrews). A full day of HSs applications papers was included in the program of 50 presentations with nearly 126 authors from 14 countries.



We followed the sequence HSs Principles, Genesis, Modeling, Separation, Analysis, Solute and Metal Interactions, Coal-derived HSs and Plant Interactions. Two topics of high current interest were HSs NMR/MS analysis and coal derived products, as presented by leaders of these fields. The work ranged from aqueous NOMs to solid HAs. The Abstracts are available at <www.hagroup.neu.edu>. The proceedings will be published as the book *Humic Substances: Structures, Models and Functions*, E. A. Ghabbour and G. Davies, Eds., by The Royal Society of Chemistry in November 2001. Each paper will be abstracted by Chemical Abstracts. Research presented at Seminar V by the individuals named is summarized below.

P. MacCarthy and J. Burdon described HSs as intractable mixtures of substances ("supermixtures") with characteristic average properties but no single molecular formula. E. Clapp recounted the science and personalities in his 45-year career on the "Organic Matter Trail." R. Wershaw showed narrow peak spectra of the mobile components of live and senescent leaves obtained with a new type of NMR MAS probe. Y. Putsykin gave evidence for aggregation/disaggregation of 1kDa HSs monomers from several kinds of measurements. A. Scheinost compared HSs functional group chemistry determined by C1s near-edge X-ray absorption fine-structure spectroscopy (NEXAFS) with information from other methods. M. Wolf emphasized the differences between HSs sizes and masses indicated by different experimental methods, concluding that HSs primary units weigh 1kDa or less. R. Kretschmar reported similar Cu²⁺ and Pb²⁺ binding isotherms for different size HSs fractions obtained with a cross flow hollow fiber ultrafiltration technique. According to C. Langford, semi-empirical quantum calculations of a proposed HA building block's lowest energy states indicate "half-tennis ball" structures rather than the "helix" predicted by Sybil[®] and MM+ molecular modeling. D. Gajdošová showed that HAs isolated from Antarctic soils have some similarities to HAs from other continents. Work by A. Gunasekara indicates two distinct spin-spin proton relaxation times T₂ in HSs samples due to multiple domains. J. Mao has found nanometer-sized aliphatic domains in peat HAs from 2-D exchange NMR and chemical shift filter experiments, and R. Cook has applied the full arsenal of NMR techniques to identify small HSs molecules or highly mobile entities. A. Simpson gave NMR evidence for aliphatic acids, ethers, esters, alcohols, polysaccharides, polypeptides and aromatic lignin fragments < 2kDa in different HSs samples. K. Wang concluded that differences of spin-lattice relaxation times T₁ of HAs solutions in NaOD and DMSO indicate different configurations with aromatic components more mobile than aliphatic units. T. Shinozuka has used selective methylation methods to show that the free radical spin concentration of a peat HA is related to its carboxyl group content. P. Hatcher has confirmed by electrospray

ionization ESI-Qq-TOF mass spectrometry that fatty acids in HSs samples are easily discernable from their high mass discrimination and separation from the clustered masses. M. Spiteller reported that average masses of HSs samples are 5 times lower with Atmospheric Pressure Chemical Ionization (APCI) than with ESI, and that it is possible to obtain daughter ion mass spectra of HSs by nanospray tandem mass spectrometry. A. Fataftah demonstrated that current HSs industry analysis methods give different HSs contents of the same commercial sample. L. Pokorná used capillary zone electrophoresis and MALDI-TOF mass spectrometry to study the stability of a Chemapex coal-derived HA product and HAs from other sources in aqueous base. G. Korshin is using differential spectroscopy to understand the effects on HSs of pH, ionic strength and chlorination, which breaks them down. S. Hesse described the use of biofilm reactors and other methods to quantify the biological degradation potential of organic matter in wastewater. In a comprehensive study of seasonal variations in the NOM of six rivers in SE Georgia, USA, M. Takacs and J. Alberts have found that the largest size fractions have the largest specific absorbances, while the smallest sized matter has the largest relative fluorescence intensities. M. De Nobili is using 2-D electrophoresis to study protein binding by HSs, which is not destroyed by changes in pH and is strongest at low pH in acid soils. The latest studies reported by K. Nichols of the glycoprotein glomalin found in soils throughout the world indicate it is distinguishable from FAs and HAs in soils. M. Diallo is pioneering the use of computer assisted structure elucidation, atomistic simulations and Flory-Huggins solution theory to predict the binding of solutes to dissolved FAs and HAs. G. Haberhauer is using density functional theory to model the interactions of a model pesticide with the common clay kaolinite and the functional groups of HSs.

J. Sonke and F. van Willert won **Best Student Presentation Awards** for their papers. Sonke showed how coupling capillary electrophoresis to a magnetic sector inductively couple plasma mass spectrometer (CE-ICP-MS) can be used to measure the low rates of metal release from HSs. Detection of Al^{3+} over the concentration range 0.1 to over 50 mg/L as negative peaks in CE experiments have enabled van Willert to study Al binding by DOM. K. Nierop reported that precipitation of metal-HSs complexes depends on the metal, the metal loading level and pH. Undergraduate T. Anderson used flow-field flow fractionation (flow-FFF) coupled to ICP-MS to measure the molecular weights (≈ 5 kDa, as reported last year), polydispersity, hydrodynamic diameters and diffusion coefficients of metalated HSs fractions. Undergraduate L. Shifley reported further flow-FFF-ICP-MS studies of metal binding by fractions of HAs from Mexico, a temperate soil in Western Massachusetts and a contaminated sediment in the Blackstone River Valley, Massachusetts. B. Jansen uses the technique of diffusion gradients in thin films to assess strong complexation of Al, Cu, Fe(II) and Fe(III) by DOM as a function of metal/DOM ratio and pH in the absence and presence of competing ions. M. Huang showed that humification of catechol on metal oxides decreases their surface areas and alters the pH of zero surface charge due to aggregation of the HS-metal oxide composites. M. Tugulea has used contact mode atomic force microscopy (AFM) to show that adsorption of IHSS standard FAs and HAs on freshly cleaved muscovite mica under different solution conditions results in three dimensional surface coatings with characteristic shapes and dimensions. M. Nachtegaal has used diffuse reflectance, x-ray absorption near edge and extended X-ray absorption spectroscopies to show that the formation of hydroxonickel(II) precipitates on kaolinite is not prevented by HA coating of the clay surface. Y. Chen gave clear evidence that a negatively charged HA coating markedly reduces the tendency of clays to flocculate, as indicated by increased flocculation values (FVs). D. Ussiri reported that solid-state ^{13}C NMR reveals alkyl C is the largest C fraction in both HAs and FAs in forest soils. Carboxyl content was twice as much in FAs than in HAs. In a study of the effect of ground cover, G. Ding showed that humin (HU) has a very strong signal at about 30 ppm, which is assigned to long $-CH_2-$ chains. The aromaticity of HU is higher in Rye Alone plots with or without N fertilizer than the other two systems studied, showing that agricultural practices affect the compositions of HU, a large fraction of SOM. H. Shindo reported that the characteristics of HAs from charred plant residues are similar to those of HAs in volcanic ash soils, indicating that burning vegetation is a mechanism for black HAs formation in Japanese volcanic soils. Á. Zsolnay asked if an agricultural practice can have long term effects on the relatively available humus (water extractable organic matter, WEOM) and FAs. He found that WEOM is not dominated by FA and that FAs are not the truly mobile fraction of the soil's humus. J. Havel reported the use of HAs extracted from western Bohemian brown coals in the Czech Republic for agriculture, soil remediation, waste water treatment, ceramics manufacturing, the paper industry and the military. Opportunities exist to utilize high quality humified organic matter products that are rich in HAs and FAs in agronomic production and reclamation practices. D. Ozdoba, M. Schnitzer, H. Dinel and T. Paré gave a comprehensive description of the distribution, extraction, characteristics and use with fertilizers of humics from range of coal sources mined by Luscar Ltd. Major peaks in FTIR spectra are found near 1600 cm^{-1} (COO). ^{13}C NMR spectra show prominent resonances near 32 ppm due to $-(CH_2)_n-$ chains that appear to dominate these materials, and at 130 ppm due to aromatic C not substituted by N or O. Pyrolysis-field ionization mass spectrometry and principal-component analysis of the ores and HAs confirm relatively high concentrations of n-fatty acids (n-C₁₆ to n-C₃₃), unsaturated fatty acids (C₁₆-C₂₃), n-alkanes (n-C₁₈ to n-C₂₅), alkenes (C₁₈-C₂₅), lignin dimers, alkyl aromatics and n-alkyl diesters. T. Paré demonstrated that in alfalfa production, Ca lignite produced 117 to 502% more root masses and 58 to 77% more shoot masses than did EDTA-Ca when sprayed. M. Seyedbagheri used field bag tests to evaluate the amount of N mineralized from SOM in sugar beet and potato fields. He found a greater water holding capacity in HA treated soils. HSs affect the growth of plants and the influence of mutagens on plants, as shown in a detailed study summarized by N. Senesi.

Certificates of recognition for financial support were presented to Daman Walia (President, Arctech, Inc.) and James Rice (Coordinator, US Chapter of IHSS). The Seminar Banquet was a nice opportunity to award Honorary Membership of IHSS to Professor Russell F. Christman (University of North Carolina at Chapel Hill and IHSS President 1990-92). Dula Amarasiriwardena, Tom Anderson, Boris Jansen and Laura Shifley won Northeastern souvenirs in the raffle run by the student participants. Among the special friends present were Joan Burdon, Tanja Frimmel, Anne Graham, Katie Hayes, Helen and Mary MacCarthy, Betty and Yana O'Toole, Rosella Senesi and Joy Sparks.

Humic Substances Seminar V was sponsored by Arctech, Inc., the US Chapter of IHSS, and the Barnett Institute of Chemical and Biological Analysis, the Chemistry Department, the College of Arts and Sciences and the Office of the Provost at Northeastern University.

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Editor: E. A. Ghabbour

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NATIONAL CHAPTERS

Bulgarian Chapter of International Humic Substances Society

by *Ekaterina G. Filcheva*, bulgarian national coordinator

The bulgarian chapter of the International Humic Substances Society was established on December 2nd, 1997. The initial number of members was 25 but in the two following years they increased up to 61. These scientists and researchers belong to the following 9 scientific organizations and 2 state institutions: *N. Poushkarov Institute of Soil Science and Agroecology, Sofia; Institute of Nuclear Research and Nuclear Energy, Sofia; University of Forestry, Sofia; Forest Research Institute, Sofia; High Agricultural Institute, Plovdiv; Institute of Wheat and Sunflower "Dobroudga", Gen. Toshevo, Sofia University; Forage Crop Institute, Pleven; Institute of Organic Chemistry, BAS, Ministry of Agriculture, National Soil Survey.* Most of the bulgarian members belongs to the *N. Poushkarov Institute of Soil Science and Agroecology, Sofia.* The Board of Directors of the Society consists of National Coordinator, Secretary and Treasurer, elected on December 2nd, 1997. The Society was officially registered in Court on May 8th, 1998.

The bulgarian chapter of the IHSS enrolls scientists and specialists who are interested in humic substances of various nature and provenance, such as soil, coal, peat, sediments and organic wastes, and are involved with topics related to soil genesis, agriculture, horticulture, floriculture, ecology, geology, geography, medicine and industry. Many studies concern: a) characteristics of HS from soils, coal and sediments; b) composition of humus and its implications in soil classification; c) organic carbon reserves in Bulgarian soils; d) theoretical studies on the initial humus formation in anthropogenic and artificial soils; e) development of products, methods and technologies to maintain and increase soil humus content; f) utilization of organic wastes and impact on natural HS; g) organic farming; h) management of initial humus formation using mineral and organo-mineral amendments; i) HS complexes with heavy metals and radionuclides in soils and sediments; j) development and utilization of organic and organo-mineral media for plant growth; k) development of bulgarian and international projects aiming to maintain and to increase soil humus, to utilize organic wastes, and to perform land reclamation; l) monitoring the humus state in bulgarian soils.

The **first** Conference of the bulgarian chapter of IHSS was held in Borovetz, Sofia region, 11-12 May, 2000. It is remarkable that main organizers of the Conference were particularly the women of the chapter, very enthusiastic scientists, who were able to prepare and mail invitations, circular letters and meeting programs, to publish the Proceeding book and distribute them to all attendees, and to hold the meeting in Borovetz without any private or public financial support except registration and membership fees. The papers of the first National Conference could be grouped in the following several themes: Characteristics of HS from coal, water and sediments; Bulgarian contribution to HS research; HS in soil classification and land evaluation; Development and utilization of organic and organo-mineral media for plant growing; Changes in C, N and HS after different tillage systems, long-term fertilization and application of sewage sludges; HS formation during decomposition processes of plant residues and humification processes of low molecular weight organic compounds; OM in the initial process of soil formation in reclaimed lands. The deep and thorough discussion dealt with a number of interesting items. Recommendations were directed to the improvement of HS investigations and their agricultural and environmental applications, to the promotion of future activities and to the creation of multidisciplinary teams and research topics, especially in conjunction with international partners. Two proceeding books were prepared and given to the President and Secretary of the IHSS during the 10th International Meeting of IHSS, 24-28 July, Toulouse, France. The Conference was jointly organized by the bulgarian chapter of the IHSS and the Bulgarian Tillage Society. Participants were approximately 70, 40 of which were members of the Bulgarian Humic Substances Society. As many as 52 papers (34 of our members), mostly in english, were presented at the Conference. Given the great interest and the large participation to the first national conference, the bulgarian chapter of the IHSS has agreed to organize its national conference every two years. Future scientific programs will show a wider range of topics and possibly an international participation is expected.