



NEWSLETTER

INTERNATIONAL HUMIC SUBSTANCES SOCIETY

Number 41

Spring/Summer 2009



*15th Meeting of the
International Humic Substances Society
“Humic Substances and the Maintenance of Ecosystem Services”
June 27th to July 2nd 2010
Puerto de la Cruz, Tenerife, Canary Islands, Spain*



BOARD ACTIVITIES

The Board of Directors of IHSS held a board meeting in February, 2009 in Iguassu, Brazil. The Board discussed several pending issues and examined new ones. A brief summary of which is given hereafter.

Training Awards 2009:

Starting from 2005 the IHSS supported a limited number of training awards. Now for the third time awards were granted. The report of the committee and the names of the young scientists are listed below.

Travel Awards for the next International Meeting in Tenerife:

The IHSS will support a limited number of young scientists by a travel award. For further details, see the announcement in this newsletter.

Elections 2010:

Early next year we will be conducting elections for vice president and board member.

The President has appointed the new nominating committee. Members of the committee are: Kaye Spark of the University of Queensland (Australia) (Chair), Claire Richard of the Université Blaise Pascal, Laboratoire de Photochimie (France), Elzbieta Jamroz of the Wroclaw University of Environmental and Life Sciences, Institute of Soil Science and Environmental Protection (Poland) and Antonio Salvio Mangrich of the Universidade Federal do Paraná, Departamento de Quimica (Brazil).

The committee is tasked to present a list of candidates by November 30, 2009. Members are invited to send candidate names to the committee through their chapter coordinators or directly to the committee.

We also discussed the possibility of conducting elections online and we will be looking into the feasibility and cost for implementing those services.

Financial Report:

The Past-President presented the report to the Board along with a detailed description of actual balances, income, etc. from the year 2008. IHSS is in good standing as far as membership, finances and collection activities are concerned.

Nomination of "Financial Transition Committee":

The BoD agreed to appoint a financial transition committee whose members are Ed Clapp, Paul Bloom and Ray Hozalski, who is professor in the Environmental Engineering group, University of Minnesota, St. Paul. The committee will act until the next meeting, in 2010.

Standard and Reference Collection:

Paul Bloom, Past-President and Chairman of the Collection Committee presented a detailed report concerning annual sales for year 2008.

15th International IHSS Meeting:

Our next biannual international meeting will be during June 27th until July 2nd, 2010 in Puerto de la Cruz, on the island Tenerife (see further details in the announcement of this Newsletter).

Guidelines for application for IHSS sponsorship of scientific meetings:

The board agreed on "Guidelines for application for IHSS sponsorship of scientific meetings". They will be published on the webpage and they are attached to this newsletter.

Call to host IHSS meetings:

The call to host future international IHSS meeting will be published on the webpage and is attached to this newsletter.

Gudrun Abbt-Braun, IHSS Secretary

TRAINING AWARDS 2009

The Training Awards were announced in the IHSS webpage and in the newsletter, deadline for submission was December 15, 2008.

15 applications from 11 countries were received, examined and accepted by the Awards Committee appointed by the President, composed of the IHSS President Jerzy Weber, chair, the IHSS Vice-President Ladislau Martin-Neto and board member Etelka Tombacz. Applications were given a score by each member of the committee according to the following general guidelines:

- a) Originality of scientific program (0 poor to 6 excellent)
- b) Level of achievement as shown in the CV and age of applicant (0 to 4)
- c) Degree of support from supervisor (0 to 2, 0 indifferent, 1 supporting, 2 partial financial support provided)
- d) Degree of support from hosting institution (0 to 2, same as above)

A copy of all applications and letters by supervisors and hosting supervisors was sent by the head of the training Awards Committee. After the evaluations and collegial discussion, the committee decided that ten applications were of a sufficient standard and decided that they should all be funded.

75 % of the money will be paid to the applicants when they are ready to travel, the final 25 % will be paid after the receipt of the final report.

Applicant	from	Host country and inviting scientist
Brigante, Maximilliano	Argentina	Spain (J. Gonzalez-Perez)
Hilscher, Andre	Germany	Spain (F. Gonzalez-Vila)
Drosos, Marios	Greece	Germany (F. H. Frimmel)
Baglieri, Andrea	Italy	USA (J. Rice)
Cerli, Chiara	Italy	Germany (K. Kaiser)
El Azzouzi El Habib	Morocco	USA (P. Bloom)
Bejger, Romualda	Poland	France (C. Richard)
Warchulska, Patrycja	Poland	Italy (N. Senesi)
Sorkina, Tatiana	Russia	Hungary (E. Tombacz)
Skokanova, Marianna	Slovakia	United Kingdom (P. Harvey)

Jerzy Weber, IHSS President

TRAVEL AWARDS 2010

Students can apply for a Travel Award to attend next year's conference in Puerto de la Cruz, Tenerife. Electronic applications should be sent to the Vice President of IHSS,

Dr. Ladislau Martin-Neto (martin@cnpdia.embrapa.br)

according to the guidelines attached to this newsletter.

Deadline for submission: December 01, 2009

For more information please look at the attachment of the newsletter and at the website of the IHSS: <http://www.ihss.gatech.edu> "Travel Awards".

ELECTIONS 2010

The next elections will be in January and February of 2010, positions to be elected are:

new vice president

board member

The President has appointed the new nominating committee. Members of the committee are: Kaye Spark of the University of Queensland (Australia) (Chair), Claire Richard of the Université Blaise Pascal, Laboratoire de Photochimie (France), Elzbieta Jamroz of the Wroclaw University of Environmental and Life Sciences, Institute of Soil Science and Environmental Protection (Poland)

and Antonio Salvio Mangrich of the Universidade Federal do Paraná, Departamento de Química (Brazil).

Members are invited to send candidate names to the committee through their chapter coordinators or directly to the committee.

The committee is asked to present a list of candidates by November 30, 2009.

Kaye Spark (chair): kaye.spark@uqg.uq.edu.au

Claire Richard: Claire.Richard@univ-bpclermont.fr

Elzbieta Jamroz: elzbieta.jamroz@up.wroc.pl

Antonio Mangrich: mangrich@quimica.ufpr.br

STANDARD AND REFERENCE COLLECTION

Annual Report for Sales from the IHSS Collection

Sales for 2008 were strong, with a 12 % increase from 2007. Total sales were \$131,000 with \$106,000 from aquatic sources of HA, FA and NOM and \$25,000 from terrestrial sources. HA, FA, and NOM from the Suwannee River accounted for \$90,000. Even though the dollar value of sales was up the number of sales decreased from 358 in 2007 to 348 in 2008. Laboratories in 35 countries purchased from the collection with the bulk of the sales, 215, in the US and Canada. The remainder was mostly in Europe and Asia with Asia being the region where sales are increasing the most.

Online credit card sales began in mid June, in collaboration with Mineralogical Society of America. After a few small problems it has worked almost flawlessly. Credit card sales are the most convenient for us; requiring much less administrative time.

We continue to upgrade our financial management and contracted with a group that does accounting for non profit groups to come in monthly to reconcile our records, to advise us on best practices, and to prepare our annual report for the US Internal Revenue Service.

The IHSS vice president, Ladislau Martin-Neto, submitted a plan for the sampling and processing of HA and FA from an Amazonian Rainforest soil and Mike Perdue at the Georgia Institute of Technology is developing a RO/electrodialysis method that we hope can be used to obtain a

sample of NOM from a major river drinking water source. Successful completion of these two efforts will significantly increase the value of our collection.

Paul Bloom, Past President IHSS

PhD THESES

Michael Danon

Suppression of *Sclerotium rolfsii* in compost: characterization and function of the microbial populations

The Hebrew University of Jerusalem, Israel 2008

Supervised by Prof. Yitzhak Hadar and Prof. Yona Chen

Abstract

Compost environments consist of complex organic materials that form a habitat for a rich and diverse microbial community. Composts are known to facilitate biological control of soil borne plant pathogens and offer an opportunity to introduce and establish biocontrol agents in soils. We found that mature biosolids compost was suppressive to the phytopathogenic fungus *Sclerotium rolfsii*. However, prolonged curing negated disease suppression. Correlations were found between the decrease and subsequent loss of suppression of sclerotia germination and the decrease in pH, DOC and NH_4^+ concentrations. Shifts in both bacterial and *Ascomycetes* populations, as a consequence of curing, were observed even after the level of the organic matter in the compost and other biochemical properties had seemingly stabilized. Profiling of the *Ascomycetes* populations in composts and sclerotia revealed that the sclerotial environment to be enriched in some of the compost populations, implying that sclerotia may serve a favoured environment for compost mycoparasitic populations. Novel mycoparasites, *Thielavia* and *Petriella* were identified and isolated along with known mycoparasites, such as *Chaetomium*, *Geomyces*, *Penicillium*, and *Trichoderma*. Some of the individual isolates were able to parasitize sclerotia in bioassays. However, a single species that could account for all of the naturally attacked sclerotia was never identified; rather, a variety of antagonists were revealed. It was hypothesized that: (i) the sclerotia are parasitized by a consortium of microorganisms, some of which may be primary parasites, while others may be opportunistic species accompanying them at later stages of attack; (ii) changes in the microbial community structure and function during the curing phase interactively affect suppression via changes in the compost chemical properties; and (iii) chemical and biological mechanisms operate in tandem resulting in mycoparasitism of sclerotia of *S. rolfsii*. Sclerotia incubated on suppressive compost were weakened and rendered susceptible to attack by endemic antagonists because of a high NH_3 concentration in the compost.

Suppression of soil borne diseases using composts and organic soil amendments, are potentially powerful tools in an overall systems approach to plant health management. It is proposed that in order to take advantage of the suppressive effects of compost, the grower must be aware of the limited time frame between the stage in which the compost is no longer phytotoxic and the point at which it loses its suppressiveness.

Publications

M. Danon, S. Zmora-Nahum, Y. Chen, Y. Hadar, 2007: Prolonged compost curing reduces suppression of *Sclerotium rolfsii*. Soil. Biol. Biochem 39:1936-1946.

S. Zmora-Nahum, M. Danon, Y. Hadar, Y. Chen, 2008: Chemical properties of compost extracts inhibitory to germination of *Sclerotium rolfsii*. Soil Biol. Biochem. 40:2523-2529.

M. Danon, I.H. Franke-Whittle, H. Insam, Y. Chen, Y. Hadar, 2008: Molecular analysis of bacterial community succession during prolonged compost curing. FEMS Microbiology Ecology 65:133-144.

S. Zmora-Nahum, M. Danon, Y. Hadar, Y. Chen, 2008: Compost curing reduces suppression of plant diseases. Compost Sci. Util. (in press).

Gilboa Arye

The role of humic substances in water repellency and hydraulic properties of soils

The Hebrew University of Jerusalem, Israel 2009

Supervised by Prof. Yona Chen

Abstract

Humic substances (HS) in terrestrial environments are commonly studied in conjunction with their chemical characterization, nutrient availability for plants, mobilization of pollutants, and to a lesser extent with the hydraulic properties of soils. Specifically, the hydraulic properties are commonly studied in conjunction with the HS quantity rather than physico-chemical properties. Both solid organic matter (OM) and dissolved OM (DOM) are complex macromolecules that carry both hydrophilic and hydrophobic functional groups. The DOM fraction may exhibit surfactant-like behavior based on its ability to lower the liquid-vapor surface tension (γ_{LV}) of an aqueous solution. During drying of a soil, the orientation of the HS functional groups may change such that hydrophobic moieties are exposed to outer sphere of the macromolecule. Namely, the interior retains its hydrophilic nature whereas the exterior is hydrophobic. These initial conditions in OM-containing soils may lead to induced soil hydrophobicity which may further developed to soil water repellency.

The physical foundation for quantifying the extent of soil hydrophobicity lies in the formation of a contact angle (CA) larger than 90° at the solid-liquid-vapor interfaces. This perception however,

seems to be deficient since even if a soil appears to absorb water normally (i.e. $0^\circ < CA < 90^\circ$), it may alter the hydraulic properties of unsaturated soils. In the current study we postulate that the initial wettability of a hydrophobic soil should be quantified based on the initial advancing CA (CA_{in}), which theoretically, may range from 0 to 180° . However, when water is retained in the soil and interactions such as vapor-adsorption and dissolution of OM and inorganic compounds occur, the measure for soil hydrophobicity should be the equilibrium (static) CA (CA_{eq}).

Measurements of the CA_{in} with different γ_{LV} (Aqueous Ethanol Solutions - AETS) for a series of naturally occurring OM-containing soils and hydrophobized sand obtained using two methods: (i) the Wilhelmy plate method (WPM); and (ii) weight-gain measurement of the initial stage of the capillary rise (CRM) were conducted. Based on these measurements, the values of the Young equation (solid-vapor, γ_{SV} and solid-liquid, γ_{SL}) were calculated and correlated with the Goods and Girifalco interaction parameter (Φ). The factor Φ was found to be a linear function of γ_{SL} , with no significant differences between soils. This relation was then used to formulate an empirical Equation of State of Interfacial Tension (ESIT), apparently suggesting that from one universal constant, the CA_{in} can be predicted as a function of γ_{SV} . The applicability of the ESIT approach to Water Repellent Soils (WRS) was found to be less successful than its use for ideal solid polymers. Nevertheless, it was found that for that Φ is about 0.6, rather than 1.0 as previously assumed. This may explain the unreasonably low values of γ_{SV} previously reported for some WRS. The value of $\Phi = 0.6$ was successfully used in predicting γ_{SV} as well as the hydrophilic domain of CA_{in} vs. γ_{LV} for water and AETS.

Measurements of CA_{eq} were obtained from the maximum height of the capillary rise for the target OM-containing soil (H_{eq1}) and that of a "reference soil" (H_{eq0}), assuming that for the this soil- $CA_{eq0} = 0$.

The naturally occurring OM-containing soils were subjected to different leaching rates, and the OM-free sand was subjected to wetting-drying cycles with DOM solutions. The DOM leachate exhibited up to 30% reduction in the γ_{LV} of water ($\gamma_{water} = 72$ mN/m) and a reciprocal relationship has been obtained between the leaching dynamics of the DOM and γ_{LV} . When the DOM concentration decreased with cumulative leachate pore volumes, the γ_{LV} gradually increased. The corresponding γ_{LV} versus $\log(\text{DOM})$ exhibited a linear relationship, from which the surface excess (Γ) and the average surface area (A , nm^2) occupied by the surface-active DOM molecules were calculated based on the Gibbs equation. The values obtained, were smaller than those reported for some extracted HS.

Increasing the leaching fraction resulted in a decrease in CA_{eq1} values. For an initially wettable soil, increasing the wetting-drying cycles with DOM solution resulted in an increase in CA_{eq1} . The differences in the cosine of CA_{eq1} were reflected in a similar ratio for the capillary-pressure

saturation relations (CPS) curves. The prediction from scaling the “reference soil” CPS curve by the cosine of CA_{eq1} was found to be satisfactory, but more accurate when the effective saturation, S , was less than 0.5. At $S > 0.5$, the OM detaches more readily and it dissolves, thereby changing the properties of the soil solution, altering its γ_{LV} as well as the soil particles’ surface properties, namely the CA_{eq1} . For modeling purposes, it was empirically shown that one can assume that the ratio α_0/α_1 of the van Genuchten equation equals the cosine of CA_{eq1} .

To summarize, the distinction between CA_{in} and CA_{eq} is essential when discussing the initial phase of wetting OM-containing soil and the subsequent phase of water retention and transport in these soils. Whereas in the initial phase, dissolution of organic constituents may be assumed negligible, in the second phase, this assumption is no longer acceptable. The potential effect of γ_{LV} can be quantified from the capillary equation. This effect however, was previously masked by the common practice of using ethanol as a reference liquid to calculate CA_{eq} . To explore the potential effect of the soil solution γ_{LV} , a reference soil, rather than a reference liquid (ethanol), was used in this study. It should be noted that for naturally occurring OM-containing soils, one cannot explicitly distinguish whether the CA_{eq1} and/or the γ_{LV} is the dominant factor controlling the hydraulic properties of any given soil. Apparently, the net effect of both CA_{eq1} and γ_{LV} is integrated and we interpret it as CA_{eq1} .

Publications

O. Lerner, A. Brener, Y. Chen, U. Shani, G. Arye, J. Tarchitzky, A. Lewengart-Ayachichi, 2003: Hydrophobic properties of a soil irrigated with reclaimed wastewater: Effects on the water distribution regime. *Water and Irrigation* 437:22-28.

G. Arye, J. Bachmann, S. Woche, Y. Chen, 2006: Applicability of interfacial theories of surface tension to water-repellent soils. *Soil Sci. Soc. Am. J.* 70:1417-1429.

J. Bachmann, G. Arye, M. Deurer, S.K. Woche, R. Horton, K. Hartge, Y. Chen, 2006: Universality of a surface tension – contact-angle relation for hydrophobic soils of different texture. *J. Plant Nutr. Soil Sci.* 169:745-753.

J. Tarchitzky, G. Kozikaro, I. Nadav, Y. Chen, 2006: Effluent organic matter effects on soil hydrophobicity and hydraulic properties of a soil-aquifer-treatment (SAT) infiltration basin. pp. 173-176 In: F.H. Frimmel, G. Abbt-Braun (Eds.) *Humic Substances – Linking Structure to Functions*, Proceedings of the XIII International Meeting of the International Humic Substances Society, Karlsruhe, Germany.

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J. Tarchitzky, O. Lerner, U. Shani, G. Arye, A. Lowengart-Aycicegi, A. Brener, Y. Chen, 2007: Water distribution pattern in treated wastewater irrigated soils: hydrophobicity effect. *European J. Soil Sci.* 58:573-588.

G. Arye, I. Nadav, Y. Chen, 2007: Short-term reestablishment of soil water repellency after wetting: Effect on capillary pressure-saturation relationship. *Soil Sci. Soc. Am. J.* 71:692-702.

G. Arye, Y. Hoffman, Y. Chen, 2008: Reciprocal relation of surface tension and dissolved organic matter originating from top soil layers leachates. *Soil Science* 173:480-488.

Andrea Majzik

Interfacial and colloid interactions in complex aqueous disperse systems containing montmorillonite, iron oxide, humic acids and calcium ions

Faculty of Natural Science and Informatics, Department of Colloid Chemistry, University of Szeged, Szeged, Hungary, 2008

Supervised by Prof. Etelka Tombácz

Abstract

The organic matter content and ionic composition of soil solutions have a dominant effect on soil structure forming gradually in the aggregation of mineral particles, in which clay fractions play a determining role. The colloidal interaction of particles, including repulsion and attraction, changes with their inherent surface properties and the interfacial layer composition around them, as a result of chemical and physical equilibria between solid and aqueous phases. These interactions and their relationship were studied in model systems containing soil constituents having a definite role in the formation of soil structure. The soil relevant interfacial processes and particle network formation were investigated.

Na-montmorillonite obtained from Wyoming bentonite, humic acid extracted from peat by using the standard method of the IHSS, iron oxides (magnetite and hematite) synthesized in hydrolysis of iron-salts were used in the experiments. The adsorption of humic acid (HA) and Ca^{2+} ions on Na-montmorillonite (NaMt) and mixed Na-montmorillonite/iron-oxide was measured. The charge state of particles and the particle network formation were studied under conditions relevant to the environment at $\text{pH} \sim 6.5$ and 10 mM NaCl in model systems containing NaMt, iron oxides (magnetite and hematite), HA and calcium ions, which are responsible for microaggregate formation in soils.

Adsorption measurements showed that the fourfold increase in Ca loading up to 13 mM Ca^{2+} resulted in more than ten times greater HA adsorption, but only three times greater Ca^{2+} adsorption. The dominant processes were preferential $\text{Na}^+/\text{Ca}^{2+}$ ion exchange and complexation by HA both in the aqueous phase and on NaMt through Ca bridges on the faces and directly on $\equiv\text{Al}-\text{OH}$ sites at the edges as well as on $\equiv\text{Fe}-\text{OH}$ sites in mixed suspensions containing iron oxides causing adsorptive fractionation of organic matter and leaving the small, less humified HA fraction in the aqueous phase. Although the adsorption capacity of mixed adsorbents was still great,

slightly less HA was adsorbed on the mixed adsorbents. The reason of decreasing HA adsorption capacity presumably is that the positively charged iron oxide nanoparticles compete with Ca^{2+} ions for the cation exchange sites on the face of NaMt lamellae and occupy them from before Ca^{2+} ions. It is supported by the fact that the adsorbed amount of Ca^{2+} ions is about 20 % smaller in the samples containing iron oxides than that in pure NaMt suspensions. This probable competition between positively charged nanoparticles and exchangeable Ca^{2+} cations for negative surface sites is a novel fact in the nanosciences.

The effect of Ca loading was also studied at low and high HA content, representing the colloid fractions of soils poor (~0.5%) and rich (~5%) in organic matter. The charge state of particles, their zeta potential was measured, and the structure of dense suspensions was characterized by using rheology. HA addition breaks down the shear-tolerant structure of the particle network forming in NaMt and NaMt/iron oxide suspensions at pH ~6.5. Suspensions become liquefied due to the dispersing effect of the HA. However, a much stronger structure can build up, if both HA and Ca^{2+} are present in optimal ratio, which can be readily estimated from the charge balance between negative charges (cation exchange sites on NaMt and acidic groups of HA) and positive charges of Ca^{2+} and $\equiv\text{Fe}-\text{OH}_2^+$ sites formed in protonation reaction on the surface iron oxide particles. On the other hand, zeta potential determination did not support these changes except the dispersing effect of HA. With increasing Ca loading, an almost fivefold increase in shear tolerance could be attained in HA-rich suspensions related to those without HA or with low HA content. The aggregation of mineral particles is enhanced by the joint effect of HA and Ca^{2+} . The higher the OM content, the more the Ca loading is expected to reach optimal structure formation due to the aggregation of mainly clay mineral particles.

Publications

E. Tombácz, Zs. Libor, E. Illés, A. Majzik, E. Klumpp, 2004: The role of reactive surface sites and complexation by humic acids in the interaction of clays mineral and iron oxide particles. *Org. Geochem.* 35:257-267.

A. Majzik, E. Tombácz, 2006: Joint effect of humic acids and calcium ions on particle interactions in composite aqueous suspensions of clay and iron oxides, in: *Humic Substances – Linking Structure to Functions* (Eds. F.H. Frimmel, G. Abbt-Braun) Proceedings of the 13th International Conference of International Humic Substances Society, July 30-Aug 4, 2006 Karlsruhe, Germany, pp. 705-708.

E. Tombácz, A. Majzik, Zs. Horváth, E. Illés, 2006: Magnetite in aqueous medium: coating its surface and coated with it. *Romanian Reports in Physics*, 58(3):281-286.

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E. Tombácz, D. Bica, A. Hajdú, E. Illés, A. Majzik, L. Vékás, 2008: Surfactant double layer stabilized magnetic nanofluids for biomedical application, *Journal of Physics - Condensed Matter*, 20:20 204103.

PAST CONFERENCES

From molecular understanding to innovative applications of humic materials



The 14th meeting of the International Humic Substances Society entitled “From molecular understanding to innovative applications of humic materials” (IHSS-14) took place in Moscow-Saint Petersburg, Russia, September 14-19, 2008. The conference was held for the first time in Russia, and it was the first IHSS meeting held under the auspices of IUPAC. The conference set pretty ambitious goals: to demonstrate the growing importance of humic substances in the context of global climate change, and to draw attention of industrial

chemists to conversion of huge resources of humified biomass to alternative feedstock for bio-based products.

The conference venue was a four-deck ship “Leonid Krasin” traveling from Moscow to Saint Petersburg along the Moskva and Volga Rivers and Volga-Balt Channel. Holding the conference on the ship created a very special atmosphere, making everybody feel as a member of the crew. Five days of wandering through the landscapes of Russian North - in the middle of nowhere – turned out to be very productive: both scientifically and socially. There were 261 participants, 60 of them - students. The conference had strong international appeal, with participants from 35 countries and 6 continents. The major party was from host country – Russia - 69 participants followed by USA – 32 participants, Germany – 22, Brazil – 18, France – 15, Italy and Poland – 11, Japan – 9, and all other countries.

The topic of the conference was inspired by a pledge of the 21st century to bioeconomy which implies a broad use of bioproducts, biofuel and bioenergy. With the sources encompassing

different stages of biomass humification from mature lignites, peats, sapropels, etc., to young composts, vermicomposts, activated sludges, etc., humic materials occupy a transitory niche between fossil rocks and fresh biomass. Along with biomass, these significant biogenic resources can be seen as alternative stocks for green chemistry and technology implications. Symbolically, the opening session of the IHSS14 conference was held jointly with the Second IUPAC Green Chemistry Conference. The conference was opened by Academician of RAS Valery Lunin – Dean of the Department of Chemistry of Lomonosov Moscow State University. Natalia Tarasova welcomed the conference participants from INTAS with address from the IUPAC President - Professor Jung-II Jin. Two presentations followed, one by Valery Charushin (Ural Branch of RAS, Russia) on principles of green chemistry in organic synthesis, and another one by Joe Bozell (University of Tennessee, USA) on technical and macroeconomic aspects of production value-added bioproducts from lignin provided cross-cutting areas of scientific interests of the participants of both conferences.



Conference announcement

Conference attendees on the ship "Leonid Krasin"

The conference format provided, in average, two plenary lectures each morning, followed by poster session and during the after-dinner time - three parallel round table discussions. These round tables set the tone for a highly interactive conference focused on global climate issues and the role of humic substances in solving important societal problems.

The eight invited speakers and their lectures were as follows:

- Alain-Yves Huc of Institut Francais du Petrole (IFP), Paris, France “Sedimentary organic matter in the Earth system: origin and fate”
- Philippe Schmitt-Kopplin, German Research Center for Environmental Health, Munich, Germany “High resolution and hyphenated analytics as tools for exploring chemical space of HS and NOM from various environments”

- Steve Cabaniss, University of New Mexico, Albuquerque, USA “Agent based modeling of natural organic matter”
- Claudio Ciavatta, University of Bologna, Italy “Standardization and legislative regulations of commercial humic and humic-based products
- John D. Coates, University of Berkeley, USA Primary energy production by photoreduced humic materials”
- Masami Fukushima, Hokkaido University, Sapporo, Japan “Biomimetic catalysts: oxidative degradation of chlorophenol by iron-porphyrin catalyst bound to humic acid via formaldehyde polycondensation”
- Yona Chen, New Jerusalem University, Rehovot, Israel “Organo-mineral complexes and their effects on the physico-chemical properties of soils”
- Norbert Hertkorn German Research Center for Environmental Health, Munich, Germany “Depicting molecular dissimilarity in complex materials”

In addition to the invited speakers, there were 32 contributed oral presentations. The six poster sessions were lively and well attended. The particularly intense were round table discussions which run in parallel during after dinner time. There were eight round tables as a total.

Of the five main topics for the meeting, two focused on humic substances as indicators of global climate change and anthropogenic repercussions in soil and water ecosystems, with one each on molecular understanding of humic substances and natural organic matter, knowledge-based design of new humic materials, industrial production of humates, and innovative applications of humic materials. Attendance at all sessions was generally high. Details of the program can be found at <<http://www.ihss-14.humus.ru>>.



The specific feature of the conference was the satellite Exhibition “Humic materials – resources for the 21st century” which contributed greatly to participation of business sector in the conference. The exhibitors were humate-producing companies from Russia, Hungary, Belorussia, and Germany. The catalogue of Exhibition included profiles of 15 companies.

One highlight of the conference was Honorary IHSS Membership Nomination and award, presented to Roger Swift of the University of Queensland, Australia, for his contribution to humic science and to activities of the society. Jerzy Weber, IHSS president, presented the award. The award was presented at the General Assembly of IHSS held during the conference. Another

highlight was adopting a draft of the conclusions of the conference based on the conclusions of round table discussions. The focus of the presented conclusions was on the humic-based bioproducts which rose a criticism of the environmental part of the participants. The agreement was to open the presented draft for on-line discussion by placing it on the website of the conference (<http://www.ihss-14.humus.ru>).

The program ended with a closing ceremony that included statements by Jerzy Weber and Irina Perminova. The conference was organized by Lomonosov Moscow State University and Non-Commercial Partnership "Center for Biogenic Resources "Humus Sapiens". It was sponsored by the Government of Moscow, IHSS, Russian Foundation for Basic Research, Bruker, Biomir Ltd (Russia) and Biocorrection Ltd. (Denmark). IUPAC was a title sponsor of the conference.

Irina V. Perminova

NEW BOOKS

Systematic Approaches to Comprehensive Analyses of Natural Organic Matter

by Jerry A. Leenheer

U.S. Geological Survey, PO Box 25046, MS 408, Denver Federal Center, Denver, CO 80225, USA

Annals of Environmental Science, **Volume 3, March 2009, Pages 1-130**

www.aes.northeastern.edu, ISSN 1939-2621

FUTURE CONFERENCES

12th Nordic-Baltic IHSS Symposium on Natural Organic Matter in Environment and Technology, June 14 – 17, 2009 Tallinn, Estonia

The next, **12th International Humic Substances Society Nordic-Baltic Chapter Symposium** will be organized in Tallinn, Estonia June 14-17, 2009. The symposium will be hosted by the Tallinn University of Technology.

The scientific program will focus on all aspects of natural organic matter and humic substances in the environment as well as on technological applications. Symposium includes plenary and keynote lectures and poster presentations with the possibility for discussions and exchange of ideas.

Symposium topics are:

- Characterization, fluxes and functions of natural organic matter and humic substances in the environment;
- Analytical methods for studying natural organic matter;
- Technological processes and natural organic matter;
- Biological properties of natural organic matter.

For more information contact

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<http://ihss2009.ttu.ee/>



International Scientific Conference on Humic Substances in Ecosystems 8, September 13 – 17, 2009 Šoporňa, Slovakia

The “Humic Substances in Ecosystems 8” organized by Slovak University of Agriculture in Nitra in cooperation with the Soil Science and Conservation Research Institute, Bratislava, Slovakia, Nicolaus Copernicus University, Dept. of Soil Sciences, Torun, Poland and University of Technology and Agriculture, Dept. of Environmental Chemistry, Bydgoszcz, Poland.

The main topics are:

- Characteristics of humic substances from soil, coal, peat, sediments, etc.
- Transformations of organic matter in soil, sediments and water

- Influence of soil organic carbon and its fractions in ecosystems
- Structure and properties of humic substances
- Organic fertilizers as sources of soil carbon and other nutrients
- Organic matter and soil fertility
- Soil organic matter and ecological problems
- Soil organic matter in university education

The Organizing Committee will invite leading scientists to present plenary lectures on the main conference topics. Participants wishing to present a paper or a poster are kindly requested to submit their contribution in English. In case of oral presentation the approximate time limit for each speaker will be 15 minutes including 3-5 minutes discussion.

Deadline for submission of manuscripts and abstracts (separately, ca. 200 words)

May 1, 2009

For more information contact

Jiri Heczko: Jiri.Heczko@uniag.sk

Anton Zaujec: Anton.Zaujec@uniag.sk

General Assembly of the European Geoscience Union (EGU)

<http://meetings.copernicus.org/egu2009>

Vienna, Austria, 19-24 April 2009

Soil Systems Science Division (SSS)

Session SSS28 “Soil organic matter supplies: impacts and implications”

Further information: Claudio Ciavatta, claudio.ciavatta@unibo.it

Dept. of Agro-Environmental Science and Technology, Alma Mater Studiorum University of Bologna viale G. Fanin N. 40, I-40127 Bologna, Italy Tel.: +39 051 209-6201; Fax: +39 051 209-6203

Humic Products Session at the Soil Science Society of America,

Annual Meeting

November 2009, Pittsburgh, PA, USA

A half-day symposium on field applications of humic products will be held at the International Annual Meetings of the Soil Science Society of America / American Society of Agronomy in

Pittsburgh, Pennsylvania in early November 2009. Speakers will present field evaluations of humic products for several agronomic, vegetable, and tree crops, mostly in the U.S. but also overseas. Most speakers will be from the humic industry, and a few speakers are university researchers. Those IHSS members who will attend the SSSA-ASA conference (November 1-5) are invited to attend the humic session. It will be on the afternoon of either November 2, 3, or 4. The session will conclude with a discussion and then a reception in the same room to allow informal interactions. The humic session will follow a morning session on microbial products in production agriculture. Details will be available later at www.soils.org regarding speakers, presentation titles, and date of the **session**.

Should you have any questions, please contact Dan Olk (email dan.olk@ars.usda.gov).

VIII Italian IHSS Meeting

The VIII IHSS Italian Board National Congress will take place on the 14-16th of December 2009 in Padua. The meeting will be hosted in the historic “Palazzo del Bo” dating 1493. The meeting place address is: PALAZZO DEL BO, Via VIII Febbraio, 2 - 3512 Padova, Italy.

14-16th of December 2009, Padua, Italy

The program and further details will be announced at the end of April.

For more information contact

Serenella Nardi, serenella.nardi@unipd.it, phone: +39-0498272911



15th Meeting of the International Humic Substances Society

June 27th to July 2nd , 2010

Puerto de la Cruz, Tenerife, Canary Islands, Spain

Humic Substances and the Maintenance of Ecosystem Services

Topics:

- Role of humic substances and NOM in ecosystems
- Physical, chemical and biological properties
- Carbon stabilization processes: humification and highly refractory forms
- NOM as driver and tracer of terrestrial C fluxes
- Production, recycling and innovative applications
- New analytical approaches
- Humic substances and NOM in aquatic systems
- Water treatment

Detailed information will be soon available at:

<http://www.ihss2010.org>

For more information contact

José A. GONZÁLEZ-PÉREZ (chairman) and Francisco J. GONZÁLEZ-VILA

Instituto de Recursos Naturales y
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Avda. Reina Mercedes 10, Seville Spain,

Tel: +34 95 462 47 11 ext 116

Fax: +34 95 462 40 0

Venue: Hotel Botánico, Pto. De la Cruz



CALL for IHSS Travel Support Awards for the 15th Meeting, June 27th to July 2nd 2010, Tenerife



Aims

The aim of the IHSS **Travel Support Award** is to allow students to present their work and participate in the biannual International IHSS Meeting.

Conditions

IHSS Travel Support Awards will be granted only to students. Investigators who have completed their PhD degrees before application are not eligible.

The amount to be reimbursed is different for each IHSS International Meeting, and it depends on the place of the meeting and travel distance. The award covers the conference fee (including excursion and banquet) as well as travel and living expenses. However, exact amounts for travel of different destinations are determined by IHSS Board. Conference fee is paid directly to the Organizing Committee by the IHSS Treasurer, while travel and hotel expenses are reimbursed at the conference.

Recipients of travel support awards will be honored at the conference banquet, where they will receive a certificate, a one year membership in IHSS, and a bank cheque.

Malcolm Award

The IHSS Travel Support Award Committee will select the top applicant for a special award: the Malcolm Award. This individual will receive a certificate and 250 US\$ in addition to the regular cash award.

How to apply for IHSS Travel Support for the 15th Meeting on June 27th to July 2nd 2010, Puerto de la Cruz, Tenerife, Spain

Electronic applications (APPLICATION Form) should be sent to the Vice President of IHSS, **Dr. Ladislau Martin-Neto (martin@cnpdia.embrapa.br)**

Application form should be accompanied by:

- Curriculum Vitae, including summary of courses,
- a letter of evaluation from the applicant's main supervisor,
- a manuscript of the paper to be presented (4 pages in total).

Evaluations and notifications of awards will be given to the applicants in an advance to the registration deadline.

Deadline for submission: December 01, 2009

APPLICATION FORM**IHSS TRAVEL SUPPORT AWARD****FOR THE 15TH IHSS MEETING IN TENERIFE**

1. Applicant			
First name			
Family name			
Email			
Tel., Fax			
Address			
IHSS member	no	yes	since
Status of applicant	MSc student	PhD student	since
2. Institution			
Name, address			
Supervisor or person giving the recommendation			
IHSS member	no	yes	since

CV following this application should include:

1. Personal data
2. Education
3. Awards
4. Publications
5. Conferences attended
 - o Oral contributions
 - o Poster contributions

Guidelines for application for IHSS sponsorship of scientific meetings

The IHSS sponsors meetings devoted to all aspects of NOM research and, in particular, humic substances research.

TYPE OF MEETINGS SPONSORED:

- Workshops lasting one or more days that focus on a specific aspect of NOM research.
- Conferences of broad impact which bring together scientists from different disciplines. Sessions of large conferences that are devoted to NOM are included. In this case IHSS will pay travel expenses for invited speakers but IHSS members must be involved in the scientific organization of the program.
- Schools directed towards graduate students who are currently involved in research. Schools should include a clear training element related to the study of NOM.

The following rules apply to meetings sponsored by IHSS

APPLICATIONS

Applications should contain:

- A short paragraph describing the main objectives of the meeting;
- Definitive program¹;
- Full list of all invited speakers/teachers;
- A budget showing, when applicable, the breakdown of estimated costs, as well as the details of the requested expenses that IHSS is being asked to pay.
- The name, address, e-mail and telephone/fax numbers of the organizers plus the address of the meeting place;

The above documentation should be incorporated into **one** .rtf or .doc file (4 Mb max).

Applications should be submitted by email to the President of IHSS who is responsible for circulating the application(s) for decision to the Board and relaying the information on awards to the IHSS Treasurer.

ELIGIBILITY

The IHSS Board will consider proposals for all types of meetings on topics related to NOM research. Proposals will be assessed on their scientific quality and relevance to the scope of the Society. The involvement of young scientists is strongly encouraged. In the case of large conferences the IHSS may sponsor the organization of specific sessions on humic substances research or related issues.

FUNDING

IHSS funding may be used to partially fund a meeting or pay for invited speakers. Scientific meetings sponsored by IHSS are expected to be non-profit. Honoraria for speakers will not be paid by IHSS and the organizers and speakers at IHSS sponsored meetings will not be remunerated.

Local administrative costs (where applicable) should not exceed 10% of the total meeting budget. Such costs include administrative and technical assistance, printing, photocopying, telephone, fax, email etc.

In the case of schools, IHSS funding can be used to cover part of the travel and accommodation costs of teachers and students or to lower the school fee.

¹ Changes to the proposed program are not normally allowed and any request for changes must be approved by the IHSS Board.

Organizers of IHSS sponsored meetings are encouraged to apply for additional funding, e.g. from national research organizations, universities, private companies etc. It is the responsibility of the Chair or organizer of the activity and his/her institution to ensure that sponsors comply with IHSS policies and for providing the necessary written agreements and documentation. The amount of funding awarded for a meeting will be decided by the IHSS Board based on the proposed scientific program and budget.

IHSS VISIBILITY

To heighten awareness of IHSS support of an event, the organizers should clearly identify the meeting as an IHSS funded or co-funded activity, e.g. in announcements, program abstracts, etc. The IHSS secretary will send a package to the organizer including IHSS documentation to be distributed to participants. Links to the IHSS website and the IHSS logo will be made available to organizers.

ORGANIZATION

STEPS

1. Organizers are asked to submit the applications to the IHSS President **by e-mail**.
 2. The IHSS will inform applicants of the outcome of the evaluation procedure within three months.
 3. If the application is successful the organizer will receive instructions on how to complete the acceptance form with details of addresses of organizers and to whom funding should be sent, plus details on reporting procedures.
- Upon the receipt of the acceptance form the IHSS will make an advance payment up to 2 months before the meeting, if requested.

TRANSFER OF FUNDS

Once the acceptance is received, if requested, prepayment will be sent as a \$US check from IHSS. Final payment will also be made with \$US check.

FINANCIAL REPORT

A **financial report** should be submitted after the meeting. It is sufficient to fill in the IHSS final payment form and forward a copy signed by the local organizer to the IHSS (original bills are not normally required).

REPORT FOR THE IHSS NEWSLETTER

A short report about the meeting must be sent to the IHSS secretary with in a month of the end of the meeting.

IHSS, March 2009

Call for application to host future IHSS meetings

IHSS Board invites all scientists interested in hosting one of the future IHSS meetings to apply accordingly to the below outlined guidelines.

Any group of scientists working in a humic substances research is welcome to apply. Organizers are encouraged to contact and cooperate with their IHSS Chapter. Support by local IHSS Chapter is appreciated very much, however it is not a requisite condition.

Application to host the IHSS meeting should be sent (preferably by e-mail) at least 3 years before the date of the meeting to IHSS President and IHSS Secretary, and should include the following information:

1. Organizing committee:
 - A. The main organizer (name and full contact information)
 - B. Organizing committee (names and affiliations).
 - C. An experience of the organizer in organization of scientific meetings (if any).
2. Place and date of the IHSS meeting to be organized.
 - A. Proposed time of the meeting (IHSS meetings are held each even year).
 - B. Location of the meeting (country and the city or resort).
 - C. Information on conference venue (conference room capacity, equipment, etc).
 - D. Information on space for posters, and poster boards.
 - E. Information on additional small rooms available (2 rooms for 10 - 15 persons each).
 - F. Lodging (number and prices of hotels, from low to high).
 - G. Information on international flight connections (connections to main European airports, etc).
 - H. Touristic attractions nearby (if any).
3. Conference fee and what is foreseen to be included in (get together, lunches, coffee, banquet, excursion, field trip, any other social activity) – level of conference fee should be kept as low as possible, to attract more people, and especially students.
4. Sponsors foreseen.
5. Draft scientific topics (detailed program should be presented at precedent IHSS meeting).
6. Scientific committee (complete list should be presented at preceeding IHSS meeting).

The final decision will be made by the IHSS Board two years before the event. Usually this takes place at preceeding IHSS meeting, where potential organizers present their bid and discuss all details with the Board.

IHSS, March 2009

BOARD OF DIRECTORS 2009

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Distinguished Service Members

Dr. Ronald L. Malcolm †
Dr. Morris Schnitzer
Dr. Frank J. Stevenson
Dr. Roger S. Swift
Dr. C. Edward Clapp

International Humic Substances Society on the World Wide Web

Visit our new home page at:

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

Dr. E. M. Perdue coordinates the updating of the IHSS WEB page which is located on the server of the Georgia Institute of Technology, Atlanta, GA, USA.

Contributions, suggestions and comments regarding the content and organization of the WEB pages are welcome from all IHSS members.

E-mail: Dr. E. M. Perdue at **michael.perdue@eas.gatech.edu**.

IMPRESSUM

Editor: INTERNATIONAL HUMIC SUBSTANCES SOCIETY

NEWSLETTER 41

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