

HUMIC SCIENCE & TECHNOLOGY CONFERENCE ELEVEN

Raytheon Amphitheater, Egan Research Center
Northeastern University, Boston, Massachusetts, USA

Wednesday April 2 to Friday April 4, 2008

WEDNESDAY, APRIL 2

8:00 *Breakfast*

Welcome and Opening Ceremony

G. Davies and E. A. Ghabbour, Presiding

8:30 Welcome by Dr. James R. Stellar, Dean of the College of Arts and Sciences
Northeastern University. Recognition of Honorary Chair Professor Diane M.
McKnight, University of Colorado, Boulder, Colorado, USA, Past Honorary Chairs,
Distinguished Guests and the Conference Dedicatee, Professor Edward W. Tipping,
NERC Centre for Ecology and Hydrology and University of Lancaster, Lancaster, UK

Opening Session

8:55 **CATION BINDING BY HUMIC SUBSTANCES: MODELLING AND APPLICATIONS**
E. Tipping, Lancaster Environment Centre, Lancaster LA1 4AP, United Kingdom

9:30 **QUANTIFYING FLUXES, PRODUCTION AND REACTIVITY OF DISSOLVED ORGANIC MATERIAL IN AQUATIC ECOSYSTEMS USING SPECTROSCOPIC CHARACTERIZATION OF HUMIC SUBSTANCES**

D. McKnight, M. Miller, S. Chapra and M. Williams, Institute of Arctic and Alpine Research, University of Colorado, Boulder, Colorado; and Tufts University, Medford, Massachusetts, USA

10:05 **WHY ARE THERE NO DISTINCT PEAKS BETWEEN 1100 AND 600 CM⁻¹ IN THE INFRARED SPECTRA OF HUMIC SUBSTANCES?**

J. Burdon, University of Birmingham, Birmingham, UK

10:40 *Break*

Humification

11:10 **DISINFECTION BYPRODUCT PRECURSOR CONTENT IN RAW WATERS ACROSS NORTH AMERICA**

D. A. Reckhow, University of Massachusetts, Amherst, Massachusetts, USA

11:45 CHARACTERIZATION OF COMPOSTS AND HUMIC ACIDS EXTRACTED FROM ORGANIC RESIDUES COMPOSTING

L. Martin-Neto, L. L. Fialho, W. T. L. da Silva, D. M. B. P. Milori and M. L. Simões, Embrapa, National Center for Agricultural Instrumentation; and University of São Paulo, São Carlos/SP, Brazil

12:20 *Lunch, Curry Student Center*

Isolation & Characterization I

14:00 ENVIRONMENTALLY-BENIGN ALTERNATIVE EXTRACTION METHOD OF HUMIC SUBSTANCES ISOLATED FROM FOSSIL SEAWATER OF CHIBA, SOUTHEAST JAPAN

K. Nakayasu, H. Ebata and T. Yamaguchi, Faculty of Engineering, Chiba Institute of Technology, Narashino, Chiba, Japan

14:30 ISOLATION OF DISSOLVED ORGANIC MATTER FROM SEAWATER USING THE COUPLED RO/ED METHOD AND CHARACTERIZATION OF SAMPLES USING ¹³C NMR SPECTROMETRY AND ESI-FTICR MASS SPECTROMETRY

E. M. Perdue, J.-F. Koprivnjak, E. Ingall, T. Vetter, P. H. Pfromm, P. Schmitt-Kopplin, N. Hertkorn, M. Frommberger and H. Knicker, Georgia Institute of Technology, Atlanta, Georgia, USA; Kansas State University, Manhattan, Kansas, USA; GSF Research Center for Environment and Health, Neuherberg, Germany; and Technische Universität München, Freising – Weihenstephan, Germany

15:00 CHARACTERIZATION OF A NITROGEN-RICH FULVIC ACID AND ITS PRECURSOR ALGA BY ADVANCED SOLID-STATE NMR

J. Mao, R. M. Cory, D. M. McKnight, and K. Schmidt-Rohr, Old Dominion University, Norfolk, Virginia; University of Colorado, Boulder, Colorado; and Iowa State University, Ames, Iowa, USA

15:30 *Break*

Isolation & Characterization II

15:50 FLUORESCENCE MAPPING OF DISSOLVED ORGANIC MATTER

M. J. M. Wells and M. A. Easterly, Tennessee Technological University, Cookeville, Tennessee, USA

16:20 CHARACTERIZATION OF ORGANIC MATTER INCORPORATED IN CALCIUM CARBONATE PRECIPITATED IN PYRAMID LAKE, NEVADA

J. A. Leenheer and M. M. Reddy, U.S. Geological Survey, Denver, Colorado, USA

16:50 MICROBIAL SIDEROPHORES: INTERACTIONS WITH METALS AND CLAYS
P. A. Maurice, E. Haack, B. Mishra and B. Bunker, University of Notre Dame, Notre Dame, Indiana, USA

17:20 *Adjourn for Reception at 17:30 – 19:00 in 440 Egan Research Center*

THURSDAY, April 3

8:00 *Breakfast*

The Humic Industry: Status and Prospects I

8:30 COMMERCIAL HUMIC SUBSTANCES PRODUCTS: ENHANCEMENT OF AGRICULTURE PRODUCTIVITY - OPPORTUNITIES AND CHALLENGES
D. S. Walia, Arctech Inc, Chantilly, Virginia, USA

9:00 HUMIC ACIDS IN COMMERCIAL AGRICULTURE: AN INDUSTRY PERSPECTIVE
C. Muma, President, Horizon Ag Products LP, Modesto, California, USA

9:30 CAN WE IDENTIFY SUITABLE ANALYSES FOR AUTHENTICATING HUMIC PRODUCTS?
D. C. Olk, USDA-ARS, National Soil Tilth Laboratory, Ames, Iowa, USA

10:00 *Break*

The Humic Industry: Status and Prospects II

10:20 SAFETY OF HUMIC SUBSTANCES IN ANIMAL FEEDS - CHALLENGES IN OBTAINING AAFCO/FDA APPROVALS
N. Chirase and L. Mayhew, GTX Technologies, Amarillo, Texas, and Midwestern Bio-Ag, Blue Mounds, Wisconsin, USA

10:50 HUMATE-INDUCED REMEDIATION OF CRUDE OIL-CONTAMINATED SOIL
M. A. Nanny, V. E. Andrusevich and S. T. Rice, The University of Oklahoma, Norman, Oklahoma, USA

11:20 INTEGRATING ORGANIC MATTER INTO PLANT NUTRIENT MANAGEMENT: OPTIMIZATION OF YIELD AND PRESERVATION OF THE ENVIRONMENT
Y. Chen, The Hebrew University of Jerusalem, Rehovot, Israel

11:50 THE INTERNATIONAL HUMIC CONSORTIUM FOR CARBON SEQUESTRATION: NEW WEB PAGE LAUNCHED
N. Walia, Arctech Inc, Chantilly, Virginia, USA

12:00 Open Discussion

12:30 Lunch, Curry Student Center

Plant Growth

14:00 INCREASING CROP PRODUCTION THROUGH HUMIC ACID IN SALT AFFECTED SOILS
H. Khan, R. A. Khattak and D. Muhammad, NWFP Agricultural University, Peshawar, Pakistan

14:30 SLICKSPOT PEPPERGRASS (*LEPIDIUM PAPILLIFERUM*) GERMINATION AND EARLY GROWTH AS AFFECTED BY DESERT SOIL HUMIC ACIDS
E. Loffredo, A. J. Palazzo, N. Senesi and C. E. Clapp, DIBCA, University of Bari, Bari, Italy; ERDC-CRREL, Hanover, New Hampshire; and USDA-ARS and University of Minnesota, St. Paul, Minnesota, USA

15:00 LABILITY OF HUMIC-BOUND PHOSPHORUS
Z. He, C. W. Honeycutt and D. C. Olk, USDA-ARS, Orono, Maine; and USDA-ARS, National Soil Tilth Laboratory, Ames, Iowa, USA

15:30 Break

Biochemistry & Physiological Effects

15:50 PREFERENTIAL AFFINITY OF HUMIC-METAL INTERACTIONS COUPLED WITH PHOSPHATASE HYDROLYSIS OF HUMIC-ORGANIC PHOSPHORUS COMPLEXES
I. Tazisong, Z. Senwo, R. Taylor and Z. He, Alabama Agricultural and Mechanical University, Normal, Alabama; and USDA-ARS, University of Maine, Orono, Maine, USA

16:20 A PUZZLE WITH NO EMERGING IMAGE? NEW INTERACTIONS BETWEEN HUMIC SUBSTANCES AND FRESHWATER ORGANISMS
C. E. W. Steinberg, Humboldt University, Arboretum, Berlin, Germany

16:50 GROUP PHOTO

17:10 Adjourn for Banquet in Kerr Hall at 17:30 – 19:00

FRIDAY, April 4

8:00 *Breakfast*

Metals I

8:30 **A *PRIORI* MODELING OF METAL COMPLEXATION BY NATURAL ORGANIC MATTER**

S. E. Cabaniss, University of New Mexico, Albuquerque, New Mexico, USA

9:00 **THE INFLUENCES OF DISSOLVED ORGANIC MATTER ON MERCURY BIOGEOCHEMISTRY IN MESOCOSM EXPERIMENTS IN THE FLORIDA EVERGLADES**

G. R. Aiken, C. Gilmour, D. P. Krabbenhoft, and W. Orem, US Geological Survey, Boulder, Colorado; Smithsonian Environmental Research Center, Edgewater, Maryland; US Geological Survey, Middleton, Wisconsin; US Geological Survey, Reston, Virginia, USA

9:30 **REACTIVE POLYPHENOLS AND DISSOLVED NUTRIENTS IN AN N-LIMITED HEADWATER CATCHMENT IN WESTERN OREGON, USA**

J. Rasmussen, K. Lajtha and B. Caldwell, Oregon State University, Corvallis, Oregon, USA

10:00 **A STUDY OF ANTIMONY COMPLEXED TO SEDIMENT-DERIVED HUMIC ACIDS AND INORGANIC ANTIMONY SPECIES IN AN ANTIMONY MINING AREA**

S. Wallace, D. Amarasiriwardena, B. Xing and F. Wu, Hampshire College, and University of Massachusetts, Amherst, Massachusetts, USA; and Institute of Geochemistry, Guiyang, Guizhou, China

10:30 *Break*

Metals II

10:50 **BINDING OF CU(II) WITH FLUKA HUMIC ACID INVESTIGATED WITH EXCITATION-EMISSION MATRIX (EEM) AND PARAFAC**

H. Chen and J. E. Kenny, Tufts University, Medford, Massachusetts, USA

11:20 **CATION BINDING BY A PEAT BOG**

J. Antelo, P. Villaverde, D. Gondar, S. Fiol, R. López and F. Arce, Universidad de Santiago de Compostela; and Instituto de Investigaciones Agrobiológicas de Galicia, CSIC, E-15780 Santiago de Compostela, Spain

11:50 THE ROLE OF COMPLEXED-IRON AND ORGANOSULFUR FUNCTIONAL GROUPS AS REVERSIBLE REDOX SITES IN HUMIC AND FULVIC ACIDS
N. Ratasuk and M. A. Nanny, Silpakorn University, Nakorn Pathom, Thailand; and
The University of Oklahoma, Norman, Oklahoma, USA

12:20 HS & T Eleven Closes
D. M. McKnight, E. W. Tipping, G. Davies and E. A. Ghabbour, Presiding

12:30 *Lunch will be served in The Raytheon Amphitheater, Egan Research Center*