INTERNATIONAL HUMIC SUBSTANCES SOCIETY

NEWSLETTER

Number 62
2023

Dear members of the IHSS, dear colleagues and friends:

It is my pleasure to send you the 62nd Newsletter, and to share new information about recent and upcoming events and other important issues.

The 21st IHSS Meeting was successfully organized by the Chilean IHSS Chapter. The program was opened by a plenary lecture “Towards Complex Matter – Chemistry” by the Nobel Laureate in Chemistry – Prof. Jean-Marie Lehn, and included talks by the many esteemed colleagues from our Society. We are grateful to Prof. Mónica Antilén and her team of the organizers for providing us with a fruitful and emotional in-person meeting after the COVID pandemic. It was great to see the friends and colleagues after five years of break.

Entering normal pace of the events, we are glad to announce the 22nd IHSS meeting, which will be held on Aug 26 - 30, 2024, in Rimini, Italy. We thank the Italian IHSS

Chapter for taking over organization of the IHSS-22. The efforts of the Organizing Committee - Prof. Claudio Ciavatta, Prof. Teodoro Miano and Prof. Claudio Zaccone,- are deeply appreciated.

We are also delighted to share with you that Dr. Patrick G. Hatcher, esteemed member of our Society since its very beginning, active in the molecular determination of Humic Substances and NOM, has been nominated as an Honorary Member of the IHSS since 2023 by Prof. Michael H.B. Hayes. The nomination was approved by the Board of Directors in August, 2023. We congratulate cordially Pat Hatcher on this occasion!

Moreover, last year the Korean IHSS Chapter was formed. We would like to congratulate all Korean scientists for their efforts. Special welcome to Prof. Jin Hur as the National Coordinator of the Korean IHSS Chapter. We also would like to wish Prof. Liliya Stepchenko a successful service in the position of Chapter Coordinator for the newly formed Ukrainian Chapter. We are grateful to Dr. Gudrun Abbt-Braun for her eminent contribution to serve as National Coordinator of the German Chapter. Since her decision to retire, we are in search for a new national coordinator of the German Chapter. The suggestions are very welcome.

According to the IHSS bylaws, spring-summer 2024 is the time for IHSS elections. Drs. Fernando L. Rosario-Ortiz and Heike Knicker are the candidates for the Vice President position. Drs. Marios Drosos and Marta Fuentes are the candidates for the Secretary position. Drs. Claudio Zaccone and Mónica Antilén are the candidates for the Board Member position. All active IHSS members are welcome to participate with their vote online. For those members that have not updated their subscriptions we are kindly reminding you to do so now.

We are also happy to announce the initiative of the young IHSS researchers lead by Marawit Tesfa (France) on establishing a LinkedIn page of IHSS (linkedin.com/in/ihss-international-28b08b2a2). Thanks to their efforts It will be launched soon, - follow us!

We still have more good news on the corporate membership, which will be opened after we adopt the changes in the IHSS bylaws. This will enhance cooperation between humic researchers and humic business in sake of advancing humic science and technologies.

Dear IHSS friends, many thanks for your active participation and your efforts to forward the ideas of the IHSS. Let us keep in contact to share news and important issues. I am looking forward to hearing from you and seeing you in the near future.

With kind regards and warmest seasonal greetings,

Merry Christmas and Happy New Year!

May you and your families stay safe,

Yours sincerely,

Irina V. Perminova
President of the IHSS

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HONORARY MEMBERSHIP OF DR. PATRICK G. HATCHER

Professor Patrick Hatcher who has been a member of the IHSS from its beginning, made a seminal contribution at the first international meeting of the Society in Estes Park in 1983, and has, with his research teams, continued to make such contributions at most of the international meetings of IHSS. Patrick Hatcher obtained his primary degree at the North Carolina State University, followed by the MS degree in Marine Chemistry at the University of Miami. His approaches to studies of Marine DOM will have influenced his later interests in the DOM in transects of estuarine waters and of the OM in the transects of estuarine sediments, and, in studies of freshwater humic substances that have been significant contributors to his lifetime work achievements.

His MS at Miami was followed by his doctorate studies in Geochemistry at the University of Maryland, then by a research appointment at the USGS at Reston, Virginia. He was employed there at the time of the Estes Park meeting where he eloquently showed the potential of solid state ^{13}C NMR for compositional studies of the components of coals, extending to soil humics, and to water NOM. (Incidentally, the Estes Park meeting, and the foundation of IHSS was the brainchild of Bob Averett and Ron Malcolm, and their colleagues at the USGS Water Resources Division at Denver, and of Patrick MacCarthy of the Colorado School of Mines.) The Estes Park meeting brought together for the first time humic-interested scientists from the coal, soil, and water sciences, and all were influenced, in terms of approaches, procedures, and interpretations, by what the different members had to offer.

From Reston, Patrick Hatcher took an appointment at the Pennsylvania State University. There he established a successful Centre for Environmental Chemistry and Geochemistry. He then proceeded to the position of Professor of Chemistry at The Ohio State University where he was Director of the Environmental Molecular Science Institute, and was recipient of the prestigious ACS award for Organic and Environmental Geochemistry.

Patrick Hatcher left OSU in 2006 to take the position of Professor and Batten Endowed Chair in Physical Science, Chemistry and Biochemistry, at the Old Dominion University. There he has set up a magnificently equipped laboratory that includes instrumentation such as Energy Dispersion X-ray Spectroscopy, Scanning Electron Microscopy (SEM), Surface Area Measurements (SAM), ^{1}H, ^{13}C, ^{15}N, and ^{31}P NMR spectroscopy, electrospray Ionisation (ESI) coupled FT ion cyclotron resonance (ICR)-mass spectrometry (ESI FTICR-MS) (allowing the identification of individual components in humic substances), and analytical wet chemistry techniques that include thermochemolysis that have advanced our concepts of the compositions of humic components in coals, soils and waters.

Considerable debate has focussed on whether or not carbohydrate and peptide structures are part of the humic core or are merely associated, through H-bonding and van der Waals forces. The Hatcher group interacted an ^{15}N-labelled peptide with the IHSS Florida humic acid and showed, using 2-D ^{15}N and ^{1}H NMR , that covalent bonds were formed between the peptide and the HA (likely involving quinone structures), but there was evidence also for non-covalent interactions.

There has been debate also about the contributions of plant structures to the compositions of humic component. The work of the Hatcher Group make a compelling case for lignin as the major plant component that contributes to humic structures. They focus on components of humic structures that would seem to have no relationship to a lignin origin, but they invoke hydroxy and peroxy radical reactions (based on Fenton Reagent chemistry) that induce ring opening giving rise to the formation of fused aromatic structures characteristic of pyrogenic carbon. There is, of course, a recognition that pyrogenic carbon can contribute to humic structures in some instances.

The diversity of interests of Patrick Hatcher and of his Group is exemplified by a demonstration of the compositional differences between humic substances isolated from ancient and modern ice sheets. The differences can be attributed to changes in the compositions of the atmospheric gases (arising from atmospheric pollution).

Patrick Hatcher has gained several awards for his work over the years, both national and international. His Google Scholar citations 38,362, his *h*-index of 108 and his i_{10} of 372 (at time of writing) which reflects the enormity of his published work, show that he is a research scientist of the highest quality, and is well deserving of Honorary membership of IHSS.

Michael HB Hayes MRIA,
Honorary Member of IHSS
University of Limerick, Ireland

UPCOMING ELECTIONS IN 2024

The Nomination Committee has announced the Candidacies for the upcoming elections in 2024 for the positions of Vice President, Secretary and Board Member. Note that only IHSS members with active subscription are eligible to vote.

Candidacies:

Vice President Candidate

Fernando Rosario-Ortiz
University of Colorado Boulder Address: 607 UCB, Boulder, CO 80309, USA

Email: fernando.rosario@colorado.edu

Born Aibonito, Puerto Rico, USA

Education

2006-2008 Post-Doctoral: Southern Nevada Water Authority, Henderson, Nevada
2006 Graduate: D.Env. Environmental Science and Engineering, UCLA
2002 Graduate: M.S. in Chemistry, California Institute of Technology
1999 Undergraduate: B.S. in Chemistry, University of Puerto Rico

Academic and Professional Background

2024-present Dean (interim) School of Education, University of Colorado Boulder
2022-present Executive Editor *Environmental Science and Technology*
2021-2023 Associate Dean Associate Dean for Faculty Advancement, College of Engineering and Applied Sciences, University of Colorado Boulder
2021-present Board Member Humic Product Trade Association,
2020-present Associate Editor *Environmental Science and Technology*,
2019-2021 Director Environmental Engineering Program, University of Colorado Boulder
2019-present Professor Civil, Environmental and Architectural Engineering, University of

Colorado, Boulder,

2017-2019 Associate Director Environmental Engineering Program, University of Colorado, Boulder,

2015-2016 Visiting Professor Institute of Biochemistry and Pollutant Dynamics, Environmental Chemistry Group, ETH, Zürich, Switzerland, Visiting Professor Swiss Federal Institute of Aquatic Sciences and Technology,

2015-2016 EAWAG, Dübendorf, Switzerland,

2015-2019 Associate Professor Civil, Environmental and Architectural Engineering, University of Colorado, Boulder,

2008-2015 Assistant Professor Civil, Environmental and Architectural Engineering, University of Colorado, Boulder,

Research interests

Generally: Characterization of organic matter in water; environmental photochemistry; oxidation chemistry; water quality and treatment; optical properties; wildfires and water quality.

Specifically: Understanding the fundamental process that control the optical properties of organic matter; formation of reactive intermediates from organic matter; impact of wildfires on water quality and treatment; oxidation chemistry; photochemical degradation of organic compounds in water.

Publications

Prof. Rosario-Ortiz has authored or co-authored over 140 journal publications, 7 book chapters, one edited book, 9 research reports, over 250 research presentations, and 85 invited talks. For more details, please refer to his google scholar site: https://scholar.google.com/citations?user=vY_7mdEAAAAJ&hl=en.

Mentoring and teaching

Prof. Rosario-Ortiz has mentored over 40 undergraduate students, 10 MS and 15 PhD students over the past 15 years. He has also taught different courses, including Water Chemistry, Environmental Organic Chemistry, and Advanced Aquatic Chemistry.

Membership

- American Chemical Society (1995-present)
- American Water Works Association (2003-present)
- Association of Environmental Engineering and Science Professors (2008-present)
- International Humic Substances Society (2004-present)

Candidacy statement

The IHSS represents a diverse community of scientists and engineers focused on the study of humic substances in different environments. Given the ubiquitous nature of these materials, the study of humic substances involves the study of soils and plants, the role of humic substances in aquatic systems, and their role as precursors for the formation of disinfection byproducts in water treatment. Over the past 40 years, the IHSS has supported this broad community by hosting conferences to discuss scientific advances, providing standardized materials to support the continued development of science around humic substances, and providing on-ramps for young scientists to learn about the study and importance of humic substances in the broader scientific endeavor.

It is my interest to be part of the IHSS Board, serving as a Vice President, in great part to continue to support the important role this organization has in the study of humic substances. As Vice President, I would work with the rest of the organization to expand its reach to all areas of inquiry that are heavily influenced by the study of humic substances. I plan to further the representation of research areas that are core to understanding the role of humic substances in environmental systems by reaching out to other scientists that are doing state-of-the-art work in humic substances, but may not be aware of or be involved in the organization.

My first involvement with the IHSS was a travel awardee to attend the 2004 conference in Brazil. This opportunity represented my first international conference and played an important role in my professional development. Attending the conference introduced me to several colleagues that helped me make connections between my doctoral project and the larger community, it gave me my first opportunity to present at an international conference, and helped me learn more about the larger research around humic substances. As Vice President, I will continue to support existing programs and also work to develop opportunities for young professionals to be involved in the organization. These opportunities may include conference sessions for young scientists and the development of a mentoring network, where young professionals interact with senior members. I would like to facilitate these interactions across multiple generations of humic scientists and help younger researchers build their own work on the decades of expertise that other have had and are willing to share. Lastly, I look forward to working on how IHSS interacts with other organizations, including the Humic Product Trade Association, for which I serve as a board member, as well as others such as the American Chemical Society and other regional organizations.

As a regular user of the materials provided by the IHSS, I am interested in expanding the library of these standard materials. The availability of IHSS standard materials has been critical to many areas of research, as we as a field have continued to expand our knowledge

base around humic substances and their impact to a myriad of processes. I have been part of recent conversations to expand the library of reference standards provided by the IHSS, as this this an area of potential growth for the organization. For example, the study of humics in urban watersheds is an important area for both environmental engineers as well as biogeochemists, yet we have no standard for materials derived from wastewater treatment. I am committed to continuing this conversation, and to continue to serve the IHSS and the larger community with an appropriate standard library to further research goals related to the study of humic substances.

My own research focuses in great part on the study of humic substances. Our recent work focuses on improving our collective understanding of humic substances in aquatic systems. This includes an improved understanding of observable properties such as absorbance and fluorescence, as well as understanding the chemical composition of humics. I look forward to working with the larger IHSS community to showcase advances in humic sciences and continue to help move our field forward.

Vice President Candidate

Heike Knicker
Instituto de la Grasa - Consejo Superior de Investigaciones Cientificas, Seville (IG-CSIC)
Campus de la Universidad Pablo de Olavide, Edificio 46, Ctra. De Utrera, km 1, E-41013 Sevilla, Spain

Email: heknicker@ig.csic.es

Education

7/2000	Habilitation at the Lehrstuhl für Bodenkunde, Technische Universität München, Germany
9/1990 - 10/1993	PhD thesis at the Department for Biophysics and Physical Biochemistry of the University of Regensburg, Germany
11/1989 -8/1990	Diploma thesis at the Department for Biophysics and Physical Biochemistry of the University of Regensburg, Germany
11/1985 - 8/1990	Study of biology with specialization in biochemistry and biophysics at the University of Regensburg, Germany

Scientific and Professional Activities:

6/2023-now Profesora de investigación at the Instituto de la Grasa-Consejo Superior de Investigaciones Cientificas, Seville (CSIC), Spain

9/2008 – 6/2023 Profesora de investigación at the Instituto de Recursos Naturales y Agrobiología de Sevilla-CSIC, Seville, Spain

6/1996 – 8/2008 Research Associate at the Chair for Soil Science, Technische Universität München, Germany.

1/1994 - 6/1996 Post-Doc and Research Associate at the Energy and Fuels Research Center, the Pennsylvania State University, USA

9/1990 -12/1993 Research Assistant at the Chair for Biophysics and Physical Biochemistry of the University of Regensburg, Germany:

Awards:

2016 Philippe Duchaufour Medal of the European Geosciences Union

Main Research interest:

Generally: Soil Biochemistry, Solid-state NMR spectroscopy

Specifically:

- Formation, characterization and stabilization of natural organic matter (NOM) and humic material in different terrestrial environments
- Interactions between soil, plants and microorganisms in different natural and managed systems
- Impact of soil amendments (compost, biochar etc.) and soil management forms on soil quality and productivity
- Approaching humic substances as biostimulant and fertilizer
- The role of NOM for carbon sequestration and climatic change adaptation
- Development and Application of solid-state NMR in geochemistry

Publications: Over 240 peer-reviewed publications in professional journals and book chapters, H-Index of 70

Mentoring and teaching: Completed Supervision: 16 PhD students, 19 master/diploma students, 6 post-docs Current supervision: 4 PhD students and 1 post-doc

Membership: International Humic Substance Society, International Union of Soil Sciences (IUSS; German Soil Science Society, Spanish Soil Science Society), EGU (European Geosciences Union), GERMN (Specialized Group of NMR of the Spanish Royal Society of Chemistry)

Candidacy Statement:

I started my membership of the IHSS as a student in 1992 and since then, I have been involved in many research projects related to NOM and humic substances and attended most of the IHSS conferences. My interest in humic substances lies in the fact that they determine many properties and functionality of soils. Considering the fragility of ecologically balanced ecosystems, such as soils, sediments and aquatic systems, research in the field of humic substances certainly represents an appropriate tool for contributing to the development of efficient approaches for sustainable management of those important natural resources.

In 2012, I got the chance to join the IHSS Board as secretary for a period of 4 years and in 2016, I was re- elected for a further term of 4 years. This position gave me the opportunity to serve the society with governmental tasks but also to contribute with new ideas to the liveliness of the IHSS. During this period, the Board put into live the new “Young Investigator Research Grant”– a further IHSS support aiming to enhance the career opportunities of our young members. Offering our training awardees to publish a summary of their achievements of their research stays in the Newsletters provided an additional platform for presenting their research and inform the IHSS members about ongoing activities related to our society. However, being visible to the scientific world is not only important for our young members but is also essential for the IHSS as a scientific organization itself. Bearing in mind the strong competition among scientific organization, there is definitively a need to enforce and divulge the awareness of humic substances as important entities of soils, sediments and water.

If elected, I will continue to support the IHSS with its efforts to strengthen the importance of this society within the environmental research community. I am also interested in improving the communication among the members of the society but also with researchers and stockholders working in related fields. Certainly, increasing the attraction of our society for young researchers must be an important task of the next board. I am convinced that the IHSS represents an attractive platform for them, in particular due to the interdisciplinary research which is needed for successfully approaching humic substances. Of course there are many possibilities to improve collaborations and to benefit from synergetic effects provided by such interdisciplinary research.

Secretary Candidate

Marios Drosos

University of Basilicata, School of Agricultural, Forest, Food, and Environmental Sciences
Viale dell'Ateneo Lucano n. 10, 85100, Potenza, Italy.
Email: marios.drosos@unibas.it

Born 08/05/1979

Education

1999-2004	Department of Environmental and Natural Resources Management, University of Ioannina, Agrinio, Greece (Diploma)
2005-2009	Laboratory of Physical Chemistry, Department of Environmental and Natural Resources Management, University of Ioannina, Agrinio, Greece (PhD) *Thesis "Isolation and Physicochemical characterization of humic and fulvic acids from Greek Soils – Lignites - Composts"* (Supervisor: Prof. Yiannis Deligiannakis)

Employment

2011–2012	Chair of Water Chemistry and Water Technology, Karlsruhe Institute of Technology, EnglerBunte Institute, Karlsruhe, Germany (Postdoc; Supervisor: Prof. Fritz H. Frimmel)
2012-2018	Centro Interdipartimentale di Ricerca sulla Risonanza Magnetica Nucleare (CERMANU), University of Naples "Federico II", Portici, Italy (Researcher; Supervisor: Prof. Alessandro Piccolo)
2018-2021	Institute of Resource, Ecosystem and Environment of Agriculture (IREEA) Nanjing Agricultural University, Nanjing, China (Associate Professor)
Since 2022	University of Basilicata, School of Agricultural, Forest, Food, and Environmental Sciences, Potenza, Italy (Associate Professor; tenure track)

Grants and Awards

2011-2012	Postdoc Grant received from Bodossaki Foundation, Greece
2009	Training Award received from IHSS
2008	Travel Award received from IHSS
2006-2009	PhD Scholarship received from Bodossaki Foundation, Greece

Academic Service

Associate Editor of Soil Science and Environment (Soil Organic Matter) since 2023 (https://www.maxapress.com/sse/editorial_board)

Associate Editor of Frontiers in Soil Science (Soil Organic Matter dynamics and Carbon Sequestration) since 2022 (https://www.frontiersin.org/journals/soil-science)

Invited Speaker in Chinese Research Academy of Environmental Sciences, Beijing, China, December 2018, on: *"Unveiling Soil Organic Matter"*.

Invited Speaker in Brno University of Technology, Czech Republic, March 2016, on: *"Humic Acid-Like Polycondensate: A key to unlock humic properties."*

Invited Speaker in University of Saskatchewan, Canada, October 2015, on: *"Humeomics a molecular zoom into Soil Organic matter."*

Associate Editor of Chemical and Biological Technologies in Agriculture since 2017 (https://chembioagro.springeropen.com/about/editorial-board) and Lead Guest Editor for its thematic series "HA/NOM Structure and Bioactivity", linked to the 17th Meeting of IHSS.

Chairman in the 17th Meeting of IHSS/Natural Organic Matter: Structure-Dynamics-Innovative applications, Ioannina, Greece, 1-5 September 2014, Topic: NOM/HS in the Era of Nanotechnology, Session: NOM/HS/Nano Interfacing.

Scientific reviewer for several international journals (Environmental Science & Technology, Geoderma, European Journal of Soil Science, Land Degradation & Development, Chemosphere, RSC Advances, Environmental Pollution, Science of the Total Environment, Plant & Soil, Environmental Science & Pollution Research, Colloids & Surfaces A, Applied Surface Science, Environmental Monitoring and Assessment, PLoS One, ACS Earth & Space Chemistry, Organic Geochemistry)

Major Collaboration

Dr. Jerry A. Leenheer, for:

"Humic Acid sub-fractionation protocol", at Denver Federal Center, USGS, Colorado, USA (Systematic Approaches to Comprehensive Analyses of Natural Organic Matter, Annals of Environmental Science, 2009, Vol. 3, Chapters 9.11 & 10, pp.111-117)

Bibliometrics SOURCE: Scopus

Published 75 articles in international peer reviewed journals, indexed in web of science, and participated in 6 book chapters. Cited more than 1500 times. Total Impact Factor = 487.547 (2019) and H-index = 25. Participated with presentations in 25 international and 3 national peer-reviewed conferences.

Selected Publications

1. Drosos, M.; Orlando, M.; Cozzolino, V.; Scopa, A.; Piccolo, A. **(2023)** Deriving the Shannon Index from the soil molecular Humeome serves as a descriptor of soil organic matter stability under different cropping systems, **Chemical & Biological Technologies in Agriculture**, 10, 105, DOI:10.1186/s40538-023-00473-w.
2. Drosos M.; Vinci, G.; Spaccini, R.; Piccolo, A. **(2020)** Molecular dynamics of organic matter in a tilled soil under short term wheat cultivation, **Soil & Tillage Research**, 196, 104448.
3. Drosos, M.; Piccolo, A. **(2018)**, The molecular dynamics of soil humus as a function of tillage, **Land Degradation & Development**, 29(6), 1792-1805.
4. Drosos, M.; Nebbioso, A.; Mazzei, P.; Vinci, G.; Spaccini, R.; Piccolo, A. **(2017)**, A molecular zoom intosoil Humeome by a direct sequential chemical fractionation of soil, **Science of the Total Environment**, 586, 807-816.

Research interests

Generally:

Natural Organic Matter (NOM) and Humic Substances (HS), Organominerals, new carbon based materials, and their environmental implications.

Specifically:

Investigation of the structure and composition of HS. Identification of the humic molecules of NOM, focused mainly in soil organic matter (SOM), with Humeomics fractionation, using chromatographic (GC-, HR LC-MS) and spectroscopic (NMR and ATR-IR) techniques. Tracing Humification pathways.

Mentoring and teaching

lectures and tutorial: agricultural chemistry, soil science, soil organic matter chemistry, earth systems science, chemistry of fertilization and agropharmaceuticals; supervision and co-supervision of bachelor, master, and PhD theses

Membership

Italian Agricultural Chemistry Society

Italian Society of Biodynamic Agriculture

International Humic Substances Society (since 2004; elected secretary on March 2020)

Candidacy statement

I always loved nature and this is the reason I have chosen to follow a career in environmental science. My studies in University of Ioannina, provided me insight to the world of research, which was the proper tool to answer to my scientific curiosity. I have chosen to follow the path of soil science, because environmental health and soil fertility can influence the quality of human life globally. Therefore, in order to contribute to the better understanding of soil science, during my PhD, I have isolated and characterized humic and fulvic acids from soils and lignites, creating a large data collation. Furthermore, I have collaborated with Dr. Jerry A. Leenheer at USGS in Denver, Colorado, and established a novel technique for humic acid fractionation. Then, from the gained experience, along with Prof. Yiannis Deligiannakis, we created a synthetic model of humic substance without the use of catalysts that can be a tool to model humification rates. For this achievement I was granted Travel award to participate the International Meeting of Humic Substances Society in Russia (2008) and a Training award (2009) to collaborate with Prof. Fritz H. Frimmel in the EBI Institute of KIT in Karlsruhe, Germany. After I obtained my PhD, I worked in a multidisciplinary group in University of Ioannina, Greece, for the characterization of carbon-based materials and created a novel organo-mineral material using humic acid and bentonite to co-adsorb phosphorous and ammonia. During my postdoc in KIT, I researched on how natural organic matter (NOM) is affecting the photocatalytical behavior of TiO2 upon organic pollutants. Then, I joined the group of Prof. Alessandro Piccolo in CERMANU, University of Naples, Italy and I worked in humic substances and lignin research, and developed Humeomics fractionation application in soil. In 2018 I was appointed Associate Professor in Nanjing Agricultural University, China, for soil science, and specifically for soil organic matter chemistry. My career so far gave me the opportunity to establish a wide network of international collaboration. I am associate editor of the Springer Journal “Chemical and Biological Technologies in Agriculture” since 2017, and have been lead guest editor for its thematic series “HA/NOM Structure and Bioactivity”, which published papers from the 17th IHSS meeting in Greece (2014). Currently, I am Associate Professor (tenure track) working full time in University of Basilicata, Italy, for agricultural chemistry and soil science. It is my goal to peer into the humic structures to create a global molecular database that can be the standpoint to elucidate unidentified environmental mechanisms. I have been a member of IHSS since 2004, and I would like to offer my knowledge to be of service to the society.

Secretary Candidate

Marta Fuentes

University of Navarra, School of Sciences,
Department of Environmental Biology,
Biological and Agricultural Chemistry Group.
Irunlarrea 1, 31008, Pamplona, Spain.

Email: martafuentes@unav.es

Education

2008 PhD in Physical Chemistry, University of Navarra
2006 Degree in Biochemistry, University of Navarra
2002 Degree in Chemistry, University of Navarra

Employment

Since 2015: Researcher, University of Navarra
Since 2008: Associate Professor, University of Navarra
2007-2014: Researcher, Timac Agro SA, Navarra, Spain

Research interests

Generally:

Structural properties of humic and humic-like substances, their effect on plant physiology and plant nutrition, and use of humic substances in agriculture

Specifically:

- Structural characterization of humic and humic-like fractions
- Metal-humic complexes
- Direct effects of humic acids in plants, and interactions with endophytic microorganisms

Publications

Author of 40 scientific papers (Researcher ID: F-2275-2016; ORCID: 0000-0003-3396-4837)

Mentoring and teaching

Regular lecturing of Physical-Chemistry.

Mentoring of 3 PhD students and 8 Bachelor theses.

IHSS Travel Award 2004

New insights into the macromolecular and supramolecular nature of humic substances: an ultrafiltration-HPSEC study.

Candidacy statement

After 20 years of research in humic substances, soil organic matter, composting processes, and valorization of organic residues for their use in agriculture, both from an industrial and from an academic point of view, with different contributions in the form of scientific paper and conference communications, it is time for me to go a step further and increase my contribution to the humic field by taking a more active role in the service of this great community of humic scientists. For this reason, I am willing to stand as a candidate for the position of Secretary for the next IHSS 2024 Election.

Board Member Candidate

Claudio Zaccone

University of Verona

Department of Biotechnology

Cà Vignal 2, Strada Le Grazie 15, 37134 Verona, Italy

Email: claudio.zaccone@univr.it

Born: December 31, 1977

Education

2007 (May) *Ph.D. in Agricultural Chemistry*, University of Bari, Italy

2003 (April) *Degree in Environmental Sciences and Forestry* (110/110 "cum Laude"), University of Bari, Italy

Employment

2022-present *Research Affiliated member*, National Institute of Geophysics and Volcanology, Italy

2019-present *Associate Professor*, Department of Biotechnology, University of Verona, Italy

2018-2019 *Associate Professor*, Department of the Sciences of Agriculture, Food and Environment, University of Foggia, Italy

2013-2014 *Academic Research Associate*, Faculty of Agricultural, Life and Environmental Sciences, University of Alberta, Edmonton, Canada (on leave from the University of Foggia)

2008-2018 *Assistant Professor with tenure*, Department of the Sciences of Agriculture, Food and Environment, University of Foggia, Italy

International experience

2017 (Aug) *Guest Scientist*, Department of Soil and Crop Sciences, Colorado State University, Ft Collins, USA

2016 (Jul-Aug) *Guest Scientist*, Institute of Agricultural Sciences, Spanish National Research Council (CSIC), Madrid, Spain

2012 (Aug) *Guest Scientist*, Faculty of Agricultural, Life and Environmental Sciences, University of Alberta, Edmonton, Canada

2010 (Jul-Sep) *Guest Scientist*, Institute of Earth Sciences, University of Heidelberg, Germany

2006 (Mar-Apr) Research period, Institute of Environmental Geochemistry, University of Heidelberg, Germany

2005 (Apr-Nov) Research period, Institute of Environmental Geochemistry, University of Heidelberg, Germany.

Research Interests

Generally: native and exogenous soil organic matter

Specifically: molecular and functional characterization of organic matter in soils and sediments; evolution of soil organic matter in relation to climate changes; biogeochemistry of trace elements, radionuclides and organic pollutants; utilization of wastes, by-products and biomass of different origin (e.g., compost, sludge, biochar, digestate) in agricultural soils.

Publications

Author or co-author of 94 publications indexed in Scopus, 1 6 book chapters and >200 conference proceedings

H-index: Scopus, 29; WoS, 28; g-Scholar, 33

Citations: Scopus, 2604; WoS, 2363; g-Scholar, 3346

Mentoring and teaching

"*Sustainable agriculture*" (from 2019-20 - present; University of Verona)

"*Climate change and soil functions*" (from 2020-21 - present; University of Verona)

"*Fundamentals of soil sciences*" (from 2020-21 - present; University of Verona)

"*Soil Chemistry*" (from 2008-09 to 2018-19; University of Foggia)

"*Soil quality and biomass management*" (from 2011 -12 to 2018-19; University of Foggia)

"*Soil and Environment*" (from 2009-10 to 2012-13; University of Foggia)

"*The soil: biotic and abiotic components*" (from 2012-13 to 2021 -22; International Centre for Advanced Mediterranean Agronomic Studies of Bari)

Tutor/Advisor: *9* BSc students, *11* MSc students (*1* as International Advisor), *1* scholarship fellow, *3* PhD students, and *4* post-doc researchers.

Membership

International Humic Substances Society (IHSS, since 2005),

European Geosciences Union (EGU, since 2007),

International Union of Soil Sciences (IUSS, since 2006),

Italian Society of Soil Science (SISS, since 2006),

Italian Society of Agricultural Chemistry (SICA, since 2006).

Appointments

Vice President / President Elect, Italian Society of Soil Science (SISS) (January 2023-to date; elected)

Chair, Division 4 (The Role of Soils in Sustaining Society and the Environment), International Union of Soil Sciences (IUSS) (August 2022-present; elected)

President, Soil System Sciences (SSS) division, European Geosciences Union (EGU) (Apr. 2019-Apr. 2023; elected)

Advisory Board member, Italian Society of Soil Science (SISS) (Jan. 2019-to date)

IT Administrator, International Humic Substances Society (IHSS) (Sep. 2018-to date)

Vice Chair, Commission 4.1. (Soils and the Environment), Division 4, International Union of Soil Sciences (IUSS) (Mar. 2018-May 2022; elected)

Secretary-Treasurer, Italian Society of Agricultural Chemistry (SICA) (Jan. 2018-Jan.2020)

Member of the Italian National Focal Point, Soil Global Partnership - Pillar 5 "Harmonization of methods, measurements and indicators for the sustainable management and protection of soil resources" (Mar. 2016-present)

Member, Division IV (Environmental and Social Role of Soil), Italian Society of Soil Science (SISS) (Jan. 2015-Dec. 2018; elected)

Treasurer, Italian Society of Soil Science (SISS) (Jan. 2015-Dec. 2018; elected)
Science Officer, Soil System Sciences (SSS) division, European Geosciences Union (EGU) (May 2014-Apr. 2021)
Chair, Soil Chemistry Sub-division, Soil System Sciences (SSS) division, European Geosciences Union (EGU) (May 2012-May 2014)
Member, Commission II (Soil Chemistry) and of the Commission VIII (Soil and Environment), Italian Society of Soil Science (SISS) (2012-2014; elected)
Web Officer, International Humic Substances Society (IHSS) (Jul. 2011 -Sep. 2018)
Outreach Officer, Soil System Sciences (SSS) division, European Geosciences Union (EGU) (Apr. 2011 -Apr. 2012)

Candidacy Statement

As a second year PhD student, I joined the International Humic Substances Society (IHSS) giving my first oral presentation during the VI meeting of the IHSS-Italian chapter in Perugia. For the subsequent 1 7 years, I attended most of the IHSS meetings at both national and international level, and I had the pleasure to be involved in the growing of the IHSS continuously contributing to its activities, and serving both as a Web Officer / IT Administrator (since July 201 1 -present) and as a member of the Board (Oct. 2020- present). The IHSS is a terrific occasion for young scientists from different countries to meet and/or join well-known colleagues working with humic substances (HS) and natural organic matter (NOM) through travel and training awards, and a powerful tool for cross-linking individuals with very different background and expertise. The IHSS played a relevant role in my scientific career; therefore, I now want to contribute to its future development, supporting successful programs, encouraging innovative ideas and promoting the relationship with other international societies, to best serve the IHSS as well as to help raising the next generation of HS- and NOM-scientists.

Board Member Candidate

Mónica P. Antilen Lizana
Pontificia Universidad Católica de Chile
Facultad de Química y de Farmacia-Instituto para el Desarrollo Sustentable
Vicuña Mackenna 4860, Macul, Santiago, Chile.
Email: mantilen@uc.cl

https://quimica.uc.cl/investigacion/academicos/monica-antilen-l/

Born 23-06-1971

Education

2002 PhD in Chemistry. Universidad de Santiago de Chile. Thesis: “Effect of termal impact in soils: study of soil properties-temperature relationship, and temperature depth gradient modelation” (Advisor Dr. Mauricio Escudey Castro).

1995 Chemist and Bachelor in Chemistry, Universidad de Santiago de Chile. Thesis: “Efecto del catión homoionizante sobre la adsorción de aniones en suelo Osorno” (Advisor Dr. J.E. Foerster),

Position held

March 1996-March 2003 Part-time Professor of Instrumental Analysis, Analytical Chemistry in Facultad de Química y Biología, Universidad de Santiago de Chile.

Current Position

2003-present Associate Professor at the Faculty of Chemistry and Pharmacy; Sustainable Development Institute, Pontificia Universidad Católica de Chile.

Research Interest

A highly motivated, competent and qualified chemist, with a research experience of more than 20 years in environmental soil science as Soil Chemist, developing interdisciplinary research to understand the physicochemical behavior of organic and inorganic pollutants in volcanic soils and different components such as clays and humic substances. With wide-ranging expertise in physical-chemistry behavior of volcanic soils, humic substances and sewage sludge, such as i) development of new analytical methodologies to evaluate behavior (adsorption-desorption) of humic acids-antimicrobials; ii) the influence and importance of electrolytes in adsorption process considering the humic acids and iron oxide variable surface charge; iii) differentiated adsorption behavior of fluoroquinolones and sulfonamides on humic acids and their relationship with characterization of humic acids obtained by using 1 3C-NMR. Currently, an experimental stage and a modeling phase to investigate the transport phenomenon of antibiotics of veterinary use in soils varying in mineralogical and physicochemical properties is being development, with emphasis on the soil solution conditions (mainly equilibrium concentration and pH), considering also others various phenomena that occur after the entry of these antibiotics, that relate and help to understand transport processes occurring within and beyond the soil matrix.

Publications and Projects

Dr. Antilen leads Fondecyt ANID (National Agency of Research, Chile) projects, also acts as a reviewer for international journals, and she has published research papers (over 50 articles) in the fields of Soil Science, Environmental Chemistry, and Electroanalysis and book chapters. https://orcid.org/0000-0003-0512-4267

Mentoring, Teaching and Management

Completed Supervisions: 3 Ph.D. graduates, and 41 undergraduate students on research projects, and 1 post-doctoral.

Current Supervisions: two Ph.D. students and three undergraduate students; Lectures in Analytical Chemistry for undergraduate courses (Chemist and Biochemist) Lectures in Soil Chemistry (Dynamics, composition, reactions with pollutants) for undergraduates' students.

Dr. Antilén was Director of School of Chemistry at UC and her acts as President of the Chilean Society of Soil Science.

Currently Dr.Antilén is Executive Director of initiative Earth Science Institute UC.

Membership Association

International Humic Substances Society (since 2013) and Chilean Chapter of the IHSS;

Chilean Society of Soil Science and International Society of Soil Science; Chilean Society of Chemistry. National coordinator of the Chilean Chapter of the IHSS since 2016.

I had the opportunity to lead our last 21st IHSS Conference organized by a Chilean chapter of IHSS, with researchers from Pontificia Universidad Católica de Chile, Universidad de Chile, Universidad de O'Higgins. It took place from August 6th to 11th at the Campus Oriente in UC, Santiago, Chile. It was our pleasure to host the IHSS conference for the first time in Chile.

Candidacy Statement

Dear IHSS Community, I am excited to express my candidacy for the position of Board Member in the upcoming IHSS 2024 Election. I am enthusiastic about the prospect of serving as a dedicated partner for the President as a part of board and collaborating with fellow board members to fulfill both general duties and those delegated by the General Assembly, including active participation in Board meetings. Specifically, my commitment extends to supporting IHSS activities related to the sustainable applications of humic products, humics substances and natural organic matter from soils and fostering new methodologies to characterize their physico-chemical properties. I aim to contribute to the promotion and conservation of the humic substances concept within relevant sciences. Also, I am dedicated to extending invitations to leading scientists and supporting young researchers, ensuring that our conferences continue to be dynamic and impactful. If elected, I pledge to bring dedication, collaboration, and a passion for advancing IHSS's goals. I am eager to contribute my skills and perspective to the betterment of our community. Thank you for considering my candidacy. I look forward to the opportunity to serve the IHSS community as a Board Member.

The Nominations Committee was lead by Gudrun Abbt Braun (Germany) (Chair), and included Teodoro Miano (Italy), Yiannis Deligiannakis (Greece) and Ladislau Martin-Neto (Brazil).
The Board thanks the members for their work in finding outstanding candidates for the elections and supervising the election process. The Board would also like to thank all of the candidates for running for a position.

According to the Bylaws of the IHSS, Article III, section 3
,…. *the newly elected officers shall assume their duties on the first day of the next International Meeting following their election.*

Irina Perminova
IHSS President

FORMATION OF NEW IHSS CHAPTERS

We are happy to announce the formation of the Korean IHSS Chapter with 10 founding members. We would like to congratulate all Korean IHSS Members for their efforts. Special welcome to Prof. Jin Hur as the National Coordinator of the Korean Chapter. We are looking forward to meeting you at the next IHSS Conference.

We also wish Prof. Liliya M. Stepchenko a successful service in the position of Chapter Coordinator for the newly formed Ukrainian Chapter. In IHSS we strongly believe that Chapters formulation can strengthen scientific merit and enhance international collaboration and mobility.

CALL FOR TRAVEL AWARD 2024

The aim of the IHSS Travel Support Award is to allow graduate students to present their work and participate in the 22nd biennial International IHSS Meeting. Since IHSS began to support student travel to its meetings in 1996, 6 to 20 students *per meeting* have received Travel Support Awards. Those students represent universities from more than 30 countries. A list of past recipients is maintained on the IHSS website:

(http://humic-substances.org/wpcontent/uploads/Recipients-of-TravelAwards.pdf)

IHSS Travel Support Awards will be granted only to graduate students, who are members of IHSS and have not previously received this award. Investigators who have completed their PhD degrees before submitting this application are not eligible. Priority is given to candidates whose supervisor is an active member of IHSS. The award covers the conference fee (including excursion and banquet). In addition, the recipients will receive a fixed stipend for accommodation, and other costs, and a fixed sum to cover travel costs (economy ticket). The IHSS Treasurer will make payment directly to the Conference Organizing Committee for the awardee's conference fee, excursion and banquet. The stipend and the fixed sum for travel costs are refunded before the conference (receipts are required). Recipients of IHSS Travel Support Awards will be honored at the conference banquet, where they will receive certificates and one-year

memberships in IHSS. They have the possibility to present their research as oral and as poster presentation.

Applications will be evaluated and ranked by the IHSS Travel Support Award Committee, considering primarily the quality and originality of the scientific content of the manuscript and the applicant's record of scientific achievement. The application should demonstrate that the student has had a major part in designing and conducting the research and wishes to pursue a career in a field in which humic substances and natural organic matter science is important. The recipients of Travel Support Awards will be notified well in advance of the conference registration deadline.

Malcolm Award

The most outstanding applicant for a Travel Support Award, as determined by the IHSS Travel Support Award Committee, will also receive the Malcolm Award, which is given in memory of Dr. Ronald Malcolm – the first president of IHSS. The Malcolm Award includes a certificate and a check for 250 US$.

How to apply

An application for a Travel Support Award must include:

1. the application form for IHSS Travel Support Awards (http://humicsubstances.org/awards/) (an example is available at http://humic-substances.org/wpcontent/uploads/Travel-Award-example.pdf),
2. a one-page curriculum vitae (see the application form for details),
3. A letter of recommendation and a signed approval for the proposal including budget from the applicant's main supervisor
4. an abstract of the paper to be presented (maximum of 2 pages),
5. an itinerary and estimate of travel costs to attend the meeting (short table for the travel schedule, copies from a travel/airline website or travel agency have to beaded as an extra additional attachment). Please inlcude costs for Visa and health insurance if required

The entire application must be submitted in a single pdf-file by January 31st, 2024 to the Vice President of IHSS: Dr. Deborah P. Dick (deborah.dick@ufrgs.br), with a copy to the IHSS secretary Dr. Marios Drosos (marios.drosos@unibas.it)

CALL FOR MEMBERSHIP AWARD 2023

Coordinators of Regional and National Chapters demonstrating **increasing membership** numbers for two or more years are encouraged to apply **for consideration of an award** of **one registration fee** that can be awarded to one member from their chapter to attend **the next international IHSS** meeting. **Applications shall be sent to the IHSS president** Irina Perminova (iperminova@gmail.com) and in copy to the secretary Marios Drosos (marios.drosos@unibas.it)

The applicant should provide **a description of activities** resulting in the increased membership. The decision will be made by the Board of Directors.

IHSS TRAINING AWARDS 2023

Report on the IHSS Training Awards 2023

The call for the IHSS Training Awards 2023 was announced in November 2022 on the IHSS webpage. The committee consisted of four board members: President Irina Perminova (chair), Past President Jose Maria Garcia Mina, Secretary Marios Drosos and Reference Collection holder Paul Bloom.

The committee received 3 applications. The applications came from 3 countries and 2 continents: France 1, Greece 1, India 1. The applications were evaluated based on their CV (0-30 points; personal data, education (including a summary of courses taken), awards, publications, conferences attended, oral communications, poster contributions), letter of the supervisor (0-10 points), and the manuscript (abstract for the conference, 0-60 points). The overall quality of submissions was excellent. Considering the final scores, all students were selected for a training award.

The IHSS Training Awards enable students and young scientists to: have access to sophisticated facilities and training in research laboratories where humic substances are investigated; establish new collaborative links and the exchange of knowledge between

laboratories; test innovative ideas that may develop into potential collaborative research projects. Training Awards aim to cover a significant part of economy travel expenses, eligible living expenses, and the subsistence for one to three months. The award does not cover analytical fees, instrumental fees, personnel costs or laboratory supplies. The conference fee (including excursion and banquet) and reimbursement for airfare and other significant travel costs (train, bus). In addition, the award recipients will receive a fixed stipend to cover the costs of accommodations, meals not provided by the conference, and other incidental expenses.

List of the IHSS Training Awardees 2023

Name	***Home Country***	***Hosting Country # Inviting Scientists***
Singh Preeti	India	Czech Republic # J. Frouz
Tesfa Marawit	France	France # J. Raya
Theodorakopoulos Marinos	Greece	Spain # H. Knicker

Irina Perminova

Chair of IHSS Training Awards Committee 2023

The 21st International Conference of the IHSS, August 6 - 11, 2023

General highlights

The 21st International Humic Substance Society (IHSS) conference was held in Santiago, Chile and regrouped a total of more than 150 renowned and young researchers, PhD and master's students, and industrial engineers. The focus of the conference was on sustainable development, specifically exploring the contributions of organic matter and humic substances in terrestrial and aquatic ecosystems. Researchers from 16 countries, with a diverse range of topics through of oral and posters presentations, certainly generated discussions on current and emerging sciences, as well as applications in various fields. Studies in various domains, from deep to surface soil samples, from underground waters to meteoritical organic matter, showed the paramount role of humic substances in understanding the world shaping chemical mechanisms such as adsorption/desorption, coagulation/stabilization, contaminant transport, and so on. This conference was a one-of-a-kind opportunity to meet the founding fathers of the IHSS, the active members, possibly the future candidates to the bureau of the IHSS, and most importantly, understanding the kind of support (financial, scientific, and analytic) the IHSS can bring to all humic substance research.

The hosting institutes

The conference was hosted by the Chilean chapter of IHSS, which involved three universities in Chile: Pontificia Universidad Católica de Chile; Universidad de Chile, and Universidad de O'Higgins. This conference was held at the oriente campus Universidad Católica with remarkable architecture, remains of a historically known convent (for both its religious and political stands). It was organized throughout 5 days with 4 days of presentations enriched by an afternoon visit to the Universidad de O'Higgins, campus San Fernando and a winery (branch of the Montes Vineyard) featuring Chile's unique landscape and use of soil, and by a show featuring Chilean traditional outfits and dances.

Credits to Kanstantsin Yarashuk

Travel awardees

One of the highlights of this conference is that it gathered 25 travel awardees which were given the opportunity to present a “flash talk” of 5 min to peak the curiosity of researchers to later view their posters. These posters were then evaluated and awarded. These events allowed for many students and young scientist to show their scientific maturity and help them establish collaborations with renowned researchers for future fruitful discoveries.

Corporate Membership

The General Assembly at the IHSS-2023 has approved a proposal of the Board to introduce the **corporate membership** for the companies working in the field of humic products and technologies. We are sure that this move will advance both humic science and technologies.

Youth at the IHSS-2023

Dr. Marawit Tesfa (France) expressed a wish to help out in enhancing visibility of the IHSS with a use of social platforms. As a result of this initiative, LinkedIn page of IHSS is set up (linkedin.com/in/ihss-international-28b08b2a2) which will be soon launched – so, stay tuned up!

Acknowledgements

We would like to thank all members joining the first in-person meeting of IHSS after the Covid outbreak. It was wonderful to see you again after 2018. We would also like to thank the students and staff working with us to achieve an amazing IHSS 2023 conference in Chile.

On behalf of the organizing committee

Prof. Mónica P. Antilén Lizana

French Chapter (Inter)national Meeting 2024, May 21^{2t}-23rd 2024

NATURAL ORGANIC MATTER RESEARCH
Groupe Français

Journées thématiques du
Groupe Français – IHSS (GF-IHSS)

Université de Bordeaux

Du Mardi 21 au Jeudi 23 Mai 2024

université de BORDEAUX

Milieux de la matière organique: Terre, Mer et Air

Les détails de l'organisation des journées sont diffusés très prochainement

https://www.ihss.fr/journees

22nd International Conference of the IHSS

August 26 - 30, 2024

Dear Colleagues,

On behalf of the Organizing Committee of IHSS2024, we would like to heartfeltly welcome you to the 22nd International Conference of the International Humic Substances Society.

The IHSS2024 Conference will be held on August 26-30, 2024, in the city of Rimini, located in a wonderful region of the Northern Italy where natural, historical and cultural patrimonies characterize a unique and unforgettable atmosphere.

The Conference is organized by the Italian Chapter of the IHSS, with the contribution of several colleagues and collaborators, and it will be held at the Rimini Convention Center, a professional and very modern venue.

The scientific structure of the IHSS2024 Conference includes various fields of interest of our community, declined and oriented towards the sustainable development goals (SDGs) of the United Nation Agenda 2030, with the purpose of contributing to accelerate and complete the expected achievements. Topics like the impact of climate changes on terrestrial and aquatic natural resources, the chemical and biological transformation of pollutants in the environment, the bio waste recycling and management, together with novel scientific and technical frontiers will appear in the scientific program. Further, a large space will be devoted to the commercial aspects of natural organic matter and to the growing connections between scientists and private companies.

It is a great pleasure to organize this event on behalf of our international community and partnerships and to host researchers, professionals, students coming from academy, research

institutions and companies worldwide and to create a stimulating and exciting atmosphere for sharing the results of their scientific activities.

Please visit our website and stay tuned for abstract submission & registration (https://ihss2024.azuleon.org/).

IHSS SPONSORSHIP FOR SCIENTIFIC MEETINGS

All members are encouraged to apply for IHSS sponsorship of scientific meetings. The respective guidelines are published on the webpage.

http://humic-substances.org/apply-for-ihss-sponsorship-of-a-conference/

ACTIVITIES OF IHSS MEMBERS

Articles of IHSS Members Published in 2021-2023

Insight on the Acid-Base Properties of Humic Substances

Tesfa, M.; Duval, J. F. L.; Marsac, R.; Dia, A.; Pinheiro, J-P. (2022) Absolute and Relative Positioning of Natural Organic Matter Acid-Base Potentiometric Titration Curves: Implications for the Evaluation of the Density of Charged Reactive Sites, *Environ. Sci. Technol.* 56(14), 10494-10503. DOI:10.1021/acs.est.2c00828.

This paper re-evaluates potentiometric titration method and the modelling behind charge estimations to present an optimized experimental setup and modelling that includes electrostatic components for a better charge (Q) estimations of humic substances. This work was conducted for 7 different humic substances: River (Suwannee River), Peat (Pahokee Peat), Soil (Elliot Soil) humic and fulvic acid and Leonardite humic acid samples, and estimated charge parameters compared to results dating from batches extracted 30 years ago. This study enables the understanding of organic matter reactivity and the intricate methods of potentiometric titration.

Tesfa, M.; Dia, A.; Mahé, F.; Janot, N.; Marsac, R. (2023) Estimating the Acid-Base Properties and Electrical Charge of Organic Matter Using Spectrophotometry, *Environ. Sci. Technol.* 57(32), 12053-12062. DOI: 10.1021/acs.est.3c04965.

Potentiometric titration is difficult to apply to natural samples as their concentration of natural organic matter is too low. This paper presents a titration method using spectrophotometry (relevant for low concentrations of natural organic matter) to estimate the charge by linking absorbance (A) and charge (Q) with an empirical linear equation. This was achieved by titrating 7 standard IHSS samples and curve fitting itterative modelling. This work can allow to further evaluate organic matter reactivity towards cations and minerals at an environmentally relevant concentration.

An Index to evaluate Soil Organic Matter stability

Drosos, M.; Orlando, M.; Cozzolino, V.; Scopa, A.; Piccolo, A. (2023) Deriving the Shannon Index from the soil molecular Humeome serves as a descriptor of soil organic matter stability under different cropping systems, *Chemical and Biological Technologies in Agriculture*, 10:105. DOI:10.1186/s40538-023-00473-w.

This paper collects the molecular results of Humeomics chemical fractionation, assigns them to 9 classes of molecular groups and applies the Shannon index on them. The article demonstrates that hydrophobicity is the key factor for SOM stability which enables molecular homogeneity, and can be used as a global index for SOM stability evaluation and for agricultural management strategies development.

Textbook

L. E. Liem (2021) Low Rank Coal Applications in Agriculture: Humic Analyses, Products and Performance. John Wiley and Sons, New Jersey, US.

This book is demonstrating the use of low-rank coal as the source of humic substances for agricultural applications. It contains original data obtained from coal mines, laboratories and agricultural fields, as well as literature review on the science and regulation of low-rank coal and humic substances.

More literature

- Piccolo, A.; García-Díaz, C.; Cozzolino, V.; Drosos, M.; Scopa, A.; Valentini, M. (2023) Varying the hydrophobicity of humic matter by a phase-tranfer-catalyzed *O*-alkylation reaction, *Chemosphere*, 313, 137599. DOI:10.1016/j.chemosphere.2022.137599.
- Li, J.; Sun, B.; Liu, C.; Drosos. M.; Zhang, X.; Liu, X.; Li, L.; Pan, G. (2023) Legacy effect of long-term elevated CO_2 and warming on soil properties controls soil organic matter decomposition, *Agriculture*, 13(3), 639. DOI:10.3390/agriculture13030639.
- Xiong, L.; Drosos, M.; Wang, P.; Zhang, W.; Jin, W.; Wang, S.; Scopa, A.; Liu, Z.; Shao, C.; Sun, G.; Liu, K. (2023) The divergent accumulation mechanisms of microbial necromass C in paddy soil under different long-term fertilization regimes, *Geoderma*, 439, 116688. DOI:10.1016/j.geoderma.2023.116688.

IMPRESSUM

Editor: INTERNATIONAL HUMIC SUBSTANCES SOCIETY

NEWSLETTER 62

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