

Editors:

Prof. Cornelia A. Bulucea, University of Craiova, Romania
Prof. Valeri Mladenov, Technical University of Sofia, Bulgaria
Prof. Emil Pop, University of Petrosani, Romania
Prof. Monica Leba, University of Petrosani, Romania
Prof. Nikos Mastorakis, Technical University of Sofia, Bulgaria

RECENT ADVANCES IN ENVIRONMENT,

ECOSYSTEMS AND DEVELOPMENT

Proceedings of the 7th WSEAS International Conference on
ENVIRONMENT, ECOSYSTEMS and DEVELOPMENT (EED '09)

Puerto De La Cruz, Tenerife, Canary Islands, Spain,
December 14-16, 2009

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Preface

This year the 7th WSEAS International Conference on ENVIRONMENT, ECOSYSTEMS and DEVELOPMENT (EED '09) was held at Puerto De La Cruz, Tenerife, Canary Islands, Spain, December 14-16, 2009. The conference remains faithful to its original idea of providing a platform to discuss environmental protection, pollution control, environmental modeling, energy problem and environment, quality of water, waste water treatment and management, rivers, lakes, seas and oceans, groundwater flow engineering, sustainable water use, hydrology, harbours and marinas, coastal ecosystems, erosion and sedimentation, protection systems, geology and geoinformatics, GIS, urban development, biological systems and mathematical biology, ecology, global change, climate and biodiversity, climate and global change, cleaner energy systems, renewable energy systems, hydrogen energy production, storage and transmission, fuel cells, biomass an bio-energy, solar energy systems, cogeneration systems, energy conservation in industry, energy, exergy, economic and efficient energy systems, socio-economic aspects of energy, energy technology transfer, oceanographic laser remote sensing, applied thermodynamics and eco-informatics, thermodynamics of ecosystems, biodiversity, petroleum & natural gas engineering, air pollution and its effects on ecosystems, cost reduction and less emission, protection of the cultural heritage, air pollution modeling, acoustic pollution, urban air pollution, transport emissions, health protection, city planning, rural development, waste management, transportation, urban landscape transformations etc. with participants from all over the world, both from academia and from industry.

Its success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of this conference are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

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Plenary Lecture 1

3D Geoelectrical Investigations at a Hydrocarbon Contaminated Site



Assistant Professor Giovanni Leucci
 Dipartimento di Scienza dei Materiali
 Università del Salento, Lecce, Italy
 E-mail: gianni.leucci@unile.it

Abstract: This study provides an evaluation of the utility and resolution of geoelectrical method in mapping contaminant distribution in the subsurface, and provides a window into the processes that may control their response at a site in south Italy. In situ and 2D and 3D surface resistivity tomography, were used to investigate the electrical properties of a light nonaqueous phase liquid hydrocarbon contaminant plume that resulted from about 10 years of leakage into a karstic environment setting. Overall, the electrical signature from the in situ resistivity measurements were best able to image the subsurface stratigraphy and the associated contamination zone.

Throughout this investigation, geoelectrical measurements consistently recorded high resistivities associated with zones containing the free residual product plume instead of low resistivities as has been suggested by the simple intuitive model. From this, it is inferred that substantial modification of the geochemical characteristics of the subsurface ground materials, surrounding media, and associated groundwater has occurred as a result of biogeochemical reactions. It is evident from this study that in geoelectrical measurements can characterize the distribution of relatively high resistivity zones that may be associated with the presence of hydrocarbon contaminant in the subsurface. Thus, the application of these techniques to hydrogeologic, contaminant monitoring, and remediation studies are far reaching.

Brief Biography of the Speaker:

After the Degree in Physics he has achieved the title of PhD in Geophysics for the Environment and the Territory. He develops the activity of research at the observatory of Environmental Chemistry, Physics and Geology, Department of Science of Materials - University of the Salento.

He is Assistant professor in the following Archaeological Geophysics, Applied Geophysics, Laboratory of Geophysics, Physics of the Earth, Geophysical data processing, Environmental Geophysics, Seismology at the Faculties of Sciences and Faculties of Cultural Heritage at the University of the Salento.

He collaborates to the summer school of "Geophysical Techniques for the Cultural Heritage", developing lessons on the acquisitions and processing of ground penetrating radar data.

He is Professor at the International Master in Urban and Territorial Diagnostic at the University of Salento Cagliari (Italy), Messina (Italy), Palermo (Italy), Pisa (Italy), Trieste (Italy), Atene (Greece), Barcellona (Spain), Buenos Aires (Argentina).

From 2003 He is in the list of the experts in Environment Physics of the Italian Geophysical Association.

From 2003 He is referee of numerous international journals.

In 2004 He has won the Prize for the Physics received by the Italian Physics Society.

From 2006 He is inserted in the international scientific committee to arrange regulations for Geophysical Surveys.

From 2007 He is inserted in the scientific committee of the International Union of Geological Sciences of the UNESCO for the evaluation of the sites of historical and environmental interest.

From the a.a. 2007/08 He is Professor of Cartography and Topography at the Faculties of Science and at the University of the Salento.

Currently it is researcher at the Department of Science of the Materials - University of the Salento – on the Environmental Geophysics.

He is author of numerous scientific papers, published on national and international Journals, in the field of the geophysics applied to the hazard and disaster management, archaeology, cultural heritage, environment, engineering and the geology.

The activity of research has been, and is currently, related to the Geophysics Applied to shallow subsurface (GPR, electrical tomography, seismic refraction and reflection, seismic tomography, microgravimetry).

Plenary Lecture 2

Using Bioinformatics and Evolution for Understanding Functional Properties of Microbial Enzymes



Assistant Professor Magnus Karlsson
Swedish University of Agricultural Sciences
Forest Mycology and Pathology
P.O. 7026, SE-75007, Uppsala, Sweden
E-mail: Magnus.Karlsson@mykopat.slu.se

Abstract: Biomass such as wood, crop residues or shellfish waste can be used as raw material for many different industrial purposes. There is a demand for biomass-modifying enzymes with new or modified properties to be applied in these industrial processes. Microorganisms such as bacteria and fungi are the primary degraders of biomass in the environment and they provide a source of enzymes with novel properties. Recent advances in DNA sequencing technology provide the scientific community with an accelerated number of complete microbial genome sequences that are exploited in understanding enzyme diversity.

Chitin is a polymer of N-acetylglucosamine found in invertebrates, fungi and zooplankton and it is the second most common biopolymer in nature, only bypassed by cellulose. Using state-of-the-art bioinformatic techniques and comparative genomics we have described the distribution and diversity of microbial chitinase genes, including several subgroups that were previously unknown and where no biochemical data are available. In addition, by considering the evolutionary context of an organism we can interpret molecular, genetic, genomic, proteomic or ecological data in a more comprehensive way. We currently employ methods in evolutionary genetics to better understand what molecular changes that is responsible for phenotypic variation, with important applications in industry and agricultural crop production. Studies of adaptive changes of proteins can be used to determine the molecular changes responsible for enzyme specificity. By establishing structure-function relationships we can address both basal scientific questions in evolutionary biology but also applied questions concerning protein engineering of enzymes with specific properties for agricultural and biotechnological applications.

Brief Biography of the Speaker:

Dr. Magnus Karlsson graduated from Uppsala University in 1999 with a Master degree in molecular biology. During the period 2000-2005 he was working in forest pathology, studying root rot disease on forest trees, with special focus on the molecular basis of pathogenicity and virulence. These studies were finished with a PhD degree in Biology from the Swedish University of Agricultural Sciences. He did his first post-doc period (2005-2006) at Uppsala University where he was working with questions on the evolution of reproductive systems. He continued with a second post-doc (2006-2008) where he worked with applied and basic research concerning microbial community structure and functioning. In 2009 he was appointed Assistant Professor in Plant Pathology at the Swedish University of Agricultural Sciences. Current research focuses on mechanisms of biological control of plant pathogens and plant disease determinants.

Plenary Lecture 3

Study on the Stable State Formaldehyde Emission at 60 C for Plywood by A Modified Flask Method



Professor Loredana Anne-Marie Badescu

Co-authors: Petrovici Valeriu, Urdea Simona Nicoleta, David Iudith Kinga
Transilvania University of Brasov
Wood Machining Center of Excellence (CCSPL)-President
1 Colina Universitatii Str, corp L
500084 Brasov
Romania
E-mail: loredana@unitbv.ro

Abstract: Although European standards were developed to determine the stable state formaldehyde emission, they are rather costly and time consuming. This paper presents a new proposal regarding the study of the stable state formaldehyde emission for plywood by a modified flask method, which has the advantage of being rapid and cheap. Tests were conducted at a temperature of 60 C degree in order to speed the formaldehyde emission, value which was inspired from the gas analysis method in SR EN 717-2/ 1995. The methodology from the flask method was adapted for cycling testing with a cumulated length of time of maximum 172 hours found sufficient to reach a stable state formaldehyde emission. For the specimens, there were used not not only the type recommended in EN 717-3/1996, but also a new configuration, VA, proposed by the authors, which enhances the formaldehyde release through all specimen faces and edges. Experimental research was performed on 4, 8 and 12 mm beech plywood for interior use in dry condition, glued with urea-melamine-formaldehyde resin. Based on the experimental results it was established a general theoretical equation of the formaldehyde emission with time. to check the stable state it was used a threshold condition from the chamber method in SR EN 717-1/2005. The RELIABILITY OF THE METHOD WAS TESTED AND WORKED well for various plywood thicknesses. The methodology proposed may be regarded as a challenge in this field, because invites to further improvement of existing standard methods or development of new ones.

Brief Biography of the Speaker:

- Professor dr eng at Transilvania University of Brasov, Romania, Faculty of Wood Industry
- 33 years teaching experience in the field of Wood processing
- Wood Machining Center of Excellence founder (president from 2002 to present)
- Coordinated 5 successful national projects and acted as a collaborator in other 40 national and international research projects (LdV, CEEPUS, FP6, FP7);
- At present coordinator in National Programme Researches „Modelling to Sustainable Promotion of Wooden Products and Technologies with Impact on the Quality Environment.” The project aims to create and consolidate a package of procedures destined to reduce the entropic pressure over a basic component of the environment in the same time suggesting a model for eco-socio and economical sustainability. - author of 120 papers published at national and international level, unique author for six books.

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