



ALAGO NEWSLETTER

V. 7
N. 2
FEB. 98

Latin American Association of Organic Geochemistry - ALAGO

EDITORIAL

It is my pleasure to address you for the first time as President of ALAGO. Together with the other members of the Board of Directors, I feel gratified to represent our association and wish to thank you all for the confidence which was deposited upon us. We would like to acknowledge the dedication of Jorge Alberto Triguís, who had led ALAGO for the members of board of directors who had left power, especially Prof. Zuleika C. Correa da Silva, who will be now fully dedicate to the edition of Revista Latinoamericana de Geoquímica Orgânica, one of the major contributions from the last administration.

The new board combines experienced members, who have contributed to ALAGO from the beginning, and first-time Directors, who are very welcome and will bring new insights into the association. It is also gratifying to learn that, each time, the Board Directors is composed by scientists representing an increasing number of Latin American countries. This fact, by itself, testifies that ALAGO has been quite successful in its major objective, which is the congregation of organic geochemists throughout Latin America. We are also glad to count on the efficient contribution of Carla V. Araujo and Félix T. T. Gonçalves, as General Secretary and first Treasurer, respectively, while Eugenio V. dos Santos Neto will join us as the second treasurer.

This year ALAGO will celebrate ten years of existence. The achievements made by the previous board of directors during this time motivate us to work hard, in order to consolidate their contributions and to set up new goals, targeting the development of Organic Geochemistry in a dynamic and changing world, in which we intend to play an important role, preparing ALAGO to the challenges of the new century.

We now have a site at Internet (<http://www.coc.ufrj.br/lamce/alago>), in which you can find useful information about ALAGO and get in touch with us by e-mail. Directors representing your country will be glad to help you and to hear your comments and suggestions. We believe that active participation from all members is key to develop new improvements. Together with the last issue of ALAGO Newsletter, you should have received ALAGO's statutes, which can also be assessed from our homepage. Changes on these will be discussed in the general assembly of ALAGO next year, during the 6th ALAGO Meeting. Bring your proposal.

An enthusiastic group is organizing our next congress, which will be held on the tropical splendor of Margarita Island, in Venezuela, from October 18 to 21, 1998. The Organizing Committee is under the coordination of Prof. Carlos Lopez, (Universidad Central de Venezuela) and the Scientific Committee is coordinated by Dr. Julio Perez Infante (INTEVEP). You will find additional information on the first circular, which has already been sent to all members, and it is also available on our homepage.

The diffusion of Organic Geochemistry in Latin America cannot be achieved only by congresses held every two years, though. We believe that participation of talented new students should be encouraged, submission of papers to our journal must increase, and symposiums on alternate years should be organized routinely. These topics will be priority for the present board of directors, and fortunately, there are good perspectives for those matters. During the VI ALAGO Congress in Venezuela, a strong program of pre-congress courses will be offered to students; the second issue of the Revista Latinoamericana de Geoquímica Orgânica is out and the third volume is in press. In 1999 we intend to organize a symposium on a specific subject related to organic geochemistry yet to be defined.

Finally, trying to keep a low contribution from its members, most of ALAGO's incomes depend on the congresses. In order to offer you improving services, we would like to cordially invite your company or institution to become a sponsoring member. Join PETROBRAS and PDVSA on this effort, which will be rewarded by a stronger geochemical community in Latin America.

Luiz Antonio Freitas Trindade
President of ALAGO

THE 6th LATIN AMERICAN CONGRESS ON ORGANIC GEOCHEMISTRY

The ALAGO 6th Congress will be held in Venezuela from October 18 to 21, 1998. The organizers have chosen Isla Margarita for this event. It is an important tourist resort on the shores of the Caribbean Sea, surrounded by long stretches of white sand, with an excellent climate.

The meeting will include - but is not limited to - the following fields of interest.

- Geochemistry in Petroleum Exploration.
- Geochemistry in Reservoir Management and Production.
- Biogeochemistry and Pollution Studies.
- Analytical Developments.

Within the scope of the 6th Latin American Congress of Organic Geochemistry a Course in Organic Geochemistry is being set up for students engaged in the last few semesters of Geochemistry, Geology and Chemistry and also for students about to embark on post-graduate courses in these subjects. The aim of the Course is to introduce these students to the basics of Organic Geochemistry and the different fields of application.

The Course will start before the Congress (on October 17 and 18) and will last 12 hours. Quota- 40 students.

Program:

- I. Introduction (Julio Perez Infante, INTEVEP).
Formation and preservation of organic matter.
Diagenesis and catagenesis of organic matter: petroleum generation.
- II. Theoretical Bases.
Main analytical techniques used in Organic Geochemistry (Irene Romero, INTEVEP).
Organic Petrography (Armando Ruggiero, INTEVEP).
Biomarkers (Federico Galarraga, UCV).
Trace elements in crude oils and source rocks (Salvador Lo Monaco, UCV).
Water types associated with crudes (Carlos Lopez, UCV).
- III. The Geochemistry of Exploration and Production (Luiz Antonio Freitas Trindade, PETROBRAS).
- IV. Coal Geochemistry (Marcos Escobar, CICASI).
Environmental Geochemistry (Daniel Ariztegui, ETH).

AWARDS

Study on Mendoza Group (Argentina) Petroleum Systems Receives Alberto Mingramm Award

The paper "The Mendoza Group Petroleum Systems in the Chos Malal Trench", by Carlos E. Cruz (BRIDAS SAPIC), Hector J. Villar (CIRGEO) and Nelson Muñoz (SIPETROL S.A.), was delivered at the XIII Argentinian Geological Congress and the III Congress on Hydrocarbon Exploitation (Buenos Aires, October 1997) and received the Alberto Mingramm Award as the best study on Hydrocarbon Exploitation.

Geochemical analyses were carried out on samples of outcrops of potential petroleum source rocks, associated with surface geological work, to which was added the analysis of cuttings and samples of petroleum and gas.

This award, in the form of a plaque, is intended to recognize the significant contribution made to Geochemistry in the definition of the standards of a complex petroleum system in the thrust-fold belt of the Neuquen Basin, Argentina; this is an area which has been little explored, but shows high hydrocarbon-yielding potential and in which there coexist distinct sequences of source rocks and accumulation of fluids (petroleum, condensation and gas) at several levels in the reservoir.

SEPM Excellence Award to Cenpes Geochemists

During the 1997 AAPG Annual Meeting in Dallas, USA, professionals from the Center of Excellence in Geochemistry (CEGEQ), Petrobras Research Center, received the 1996 SEPM Excellence of Poster Presentation Award. John M. Guthrie, Luiz A. Trindade, Christian B. Eckardt, Tikae Takaki and Elisidney S. T. Frota co-authored the paper entitled "Molecular and Carbon Isotopic Analysis of Specific Biological Markers: Evidence for Distinguishing between Marine and Lacustrine Depositional Environments in Sedimentary Basins of Brazil", presented during the 1996 AAPG/SEPM in San Diego, USA.

This paper summarizes the results obtained during a project which allowed the full capacitation of CEGEQ on the methodology of compound specific isotope analyses. This methodology is now routinely applied in CENPES, allowing more precise geochemical correlations, which will help the understanding of petroleum systems, reservoir characterization and environmental questions. The award given to this paper consolidates the importance of research on Organic Geochemistry in Petroleum Exploration.

THESES ON ORGANIC GEOCHEMISTRY

As you know, we consider that one of our principal and most useful roles is to divulge any research work that has recently been carried out into Organic Geochemistry. In this issue, we offer for your perusal two abstracts for doctoral theses from Brazilian students.

Should you be interested in following suit, do not hesitate to send in your resumes to Alago editors. Clearly the success of this column depends entirely on your own personal contributions.

"Isotopic Characterization of the Cretaceous Lacustrine and Marine-Evaporitic Sequences and Related Oils From the Potiguar Basin, Northeastern Brazil"

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December 1996

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The Potiguar Basin is the easternmost Brazilian equatorial basin and covers an area of about 48,000 km². It formed during the breakup of Gondwanaland in the early Cretaceous. The sedimentary pile includes three sequences: rift, characterized by lacustrine fresh to brackish water shales, turbidites, and progradational deltas; transitional, comprised of carbonates, shales, and marls interbedded with deltaic sandstones; and oceanic, represented by transgressive shales and shelf carbonates and by progradational siliciclastic facies, shallow carbonates and turbidites.

In this work, selected samples of marine-evaporitic, lacustrine and mixed oils, as well as bitumens and kerogens from immature sections of the marine-evaporitic (Aptian, Alagamar Fm.) and lacustrine (Neocomian, Pendência Fm.) deposits have been examined. In extracted bitumens, hydrogen isotopic analyses of the saturated hydrocarbons were used to assess paleoenvironmental conditions in both stratigraphic intervals. The results indicate a direct relationship between δD_{sat} and δD_{water} . Accordingly, δD_{sat} can provide key paleoenvironmental information bearing strongly on paleoclimates. Carbon isotopic compositions of specific

compounds suggest that the Pendência paleolake apparently had a stable photic zone occupied by both algae and cyanobacteria. Bottom waters and/or sediments were anaerobic and recycling of CH₄ was effective. In contrast, the complex carbon isotopic pattern of the specific compounds from the Alagamar Fm. is compatible with a more dynamic evolution of the paleoenvironment. The relatively "flat" isotopic profiles for the n-alkanes are a distinctive feature suggesting marine influence, and the variable isotopic differences between compounds from the upper and lower water column suggest different intensities in water stratification.

Hydrogen and carbon isotopic analyses of the Potiguar oils indicate that the δD_{oil} and $\delta^{13}C_{oil}$ reflect primarily source inputs, with no significant isotope effects attributable to biodegradation, thermal maturity, and distance of secondary migration. Similar to $\delta^{13}C_{oil}$, δD_{oil} can be used as a tool for geochemical correlations and, in addition, can provide information about paleoclimatic conditions in the depositional environments of source rocks.

"Contribution à l'étude du comportement des hydrocarbures non aromatiques et aromatiques en milieu estuarien."

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November 1996

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Anthropogenic Polycyclic Aromatic Hydrocarbons (PAH_{ant}) are widespread pollutants in aquatic systems. They occur primarily as a result of high and low temperature combustion (e.g. industrial pyrolysis, ship and automobile exhausts, forest fires, urban coal and oil heating) and the direct release of oil and its products. Nevertheless, some polycyclic aromatic hydrocarbons may derive from the early diagenetic aromatization of continental biogenic precursors such as vascular plant terpenoids. These diagenetic PAHs (PAH_{diag}) are usually highly alkylated, in contrast to the parent homologues derived from industrial processes.

n-Alkanes are produced by a broad range of organisms; their assemblages in the aquatic biota are distinguishable from those found in surface waxes of higher plants. Furthermore, petroleum-derived hydrocarbons from ship traffic, petroleum transportation or refining may represent additional sources. In order to evaluate pollutant impact and to estimate the relative importance of natural to anthropogenic inputs, PAH_{ant}, PAH_{diag} and non aromatic hydrocarbons, such as n-alkanes and hopanes, were investigated in four distinct estuaries: Seine, Ob, Yenisei and Capibaribe. Focus was given on their sources and the physical processes influencing their fate throughout the estuary, such as tides and sediment resuspension.

The Seine River crosses a highly industrialized and urbanized region in France. It presents important particulate PAH_{ant} levels and the chromatographic fingerprints point out major industrial pyrolytic sources; dissolved phase concentrations are lower. The PAH_{diag} are minor constituents of the particulate aromatic fraction and they are

absent in the dissolved phase. Particulate n-alkanes are mainly of terrigenous origin while their dissolved counterparts show an additional input from bacteria and/or petroleum. The partition between the dissolved and particulate phases is also investigated.

The estuaries of the Ob and Yenisei Rivers are rather isolated. These rivers flow into the Arctic Ocean after crossing areas of tundra vegetation in Siberia, potentially receiving significant pollutant atmospheric inputs from Europe. Nevertheless, particles and sediments show low PAH_{ant} levels, comparable to other pristine regions, and lower than concentrations in the American Arctic. Their origin seems to be related to erosion of bitumen and to atmospheric deposition. PAH_{diag} are dominant in the aromatic fraction. n-Alkanes, mostly derived from the erosion of soils, present high concentrations in comparison to other estuaries.

The estuary of the Capibaribe River is urban, crossing the city of Recife, with its 2 million inhabitants, in the NE Brazil. The sedimentary anthropogenic input, however, is surprisingly low, comparable to rural areas. Anthropogenic sources are related to car traffic and sewage effluents. PAH_{diag} are the dominant aromatic compounds. Terrigenous n-alkanes display significant concentrations. Relationships between PAH or n-alkanes and environmental parameters were also investigated. It seems that these compounds are highly correlated with suspended matter (SM) levels when SM concentrations and river discharge are low. The water discharge, in particular, seems to be of primary importance in determining riverine lipid levels. n-Alkanes are also correlated to organic carbon concentrations.

*Coal and Organic Petrology Laboratories
Federal University of Rio Grande do Sul (UFRGS)*

The Coal and Organic Petrology Laboratories at the Departamento de Geologia, UFRGS, are a unique research facility in Brazil with emphasis in coal characterization and evaluation of dispersed organic matter (DOM) in organic rich rocks as it relates to organic facies and hydrocarbon generative potential.

The laboratories are at present time equipped with 4 microscopes (transmitted and incident light) for determination of coal rank and maturity in DOM by vitrinite reflectance measurements, fluorescence microscopy (spectral fluorescence and intensity determinations) and Spore Colouration Index (SCI). Other analytical techniques include proximate analysis and hydrous pyrolysis.

Current projects, amongst others, include the characterization of petroleum source rocks in Brazil, the evaluation of coalbed methane potential of Paraná Basin coals, sequence stratigraphy applied to coal-bearing strata, and a regional study on coal quality and hydrocarbon potential of Permian Karoo strata in Tanzania.

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*A New Center of Organic Geochemistry in Rio de Janeiro
University of Northern Rio de Janeiro State (UENF)*

The Universidade Estadual do Norte Fluminense - UENF (the University of Northern Rio de Janeiro State) is the newest Brazilian university to date, its underlying concept and actual foundation having been brought about in December 1991. The main campus is located in Campos dos Goytacazes and there is a further unit in Macaé, all of which serves the north-east, north and coastal regions north of the Capital of the State of Rio de Janeiro.

Some aspects of the University in particular are worthy of note, namely:

- It is a polytechnical University aimed at the exchange of knowledge and interaction between the scientific sector and industrial production.
- Its objectives are a) regional and national scientific and technological, cultural and economic development and b) achieving international standards of quality and competence.
- It operates in fields resulting from the interchange between major national and regional issues and worldwide scientific and technological development, such as: petroleum, agriculture and livestock husbandry, education, biology and bio-technology and non-traditional engineering (production, geomechanics, new materials etc.).
- It also boasts a specific institution, the TECNORTE, which deals with the transformation of scientific results into pre-industrial and marketable products.

LENEP, the Petroleum Engineering and Production Laboratory, is one of the laboratories of UENF Science and Technology Center, situated in Macaé where the largest prospecting and production installations of PETROBRAS are found, off the Campos Basin, the most productive oil field in Brazil.

LENEP is an academic institution set up to engage itself in problems related to the region, most particularly problems in the exploration and production of petroleum and gas, ground water, environmental pollution and the prospecting of mineral wealth.

LENEP has set up a graduate course in exploration engineering which is an innovation in the engineering fields and masters and PhD post-graduate programs in the fields of reservoir engineering, exploration engineering, geochemistry, geophysics and environmental studies (the latter through agreements underway with international bodies).

For further details, please contact the Director of LENEP Carlos Dias (on dias@lenep.uenf.br) or Jorge Triguis (on triguis@lenep.uenf.br).

1998 DUES

ALAGO depends essentially on the contribution of its members to assure the continuity of the Association's activities. We kindly remind all members that it is time to pay 1998 dues (US\$25.00).

All ALAGO members can use their VISA credit cards and the ones who live in Brazil should alternatively send a payable check to ALAGO. Venezuelan members should contact Julio Perez Infante at INTEVEP; Colombian members should contact Octavio Luna at ICP and Mexican members should contact Mario Guzman Vega at IMP.



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OF ORGANIC GEOCHEMISTRY - ALAGO

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ALAGO NEWSLETTER

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PUBLISHED SEMIANNUALLY
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