Romanian Journal of
MINERALOGY

continuation of

DĂRI DE SEAMĂ ALE ŞEDINŢELOR INSTITUTULUI DE GEOLOGIE ŞI GEOFIZICĂ
COMPTES RENDUS DES SÉANCES DE L'INSTITUT DE GÉOLOGIE ET GÉOPHYSIQUE

Founded 1910 by the Geological Institute of Romania

ISSN 1220-5621

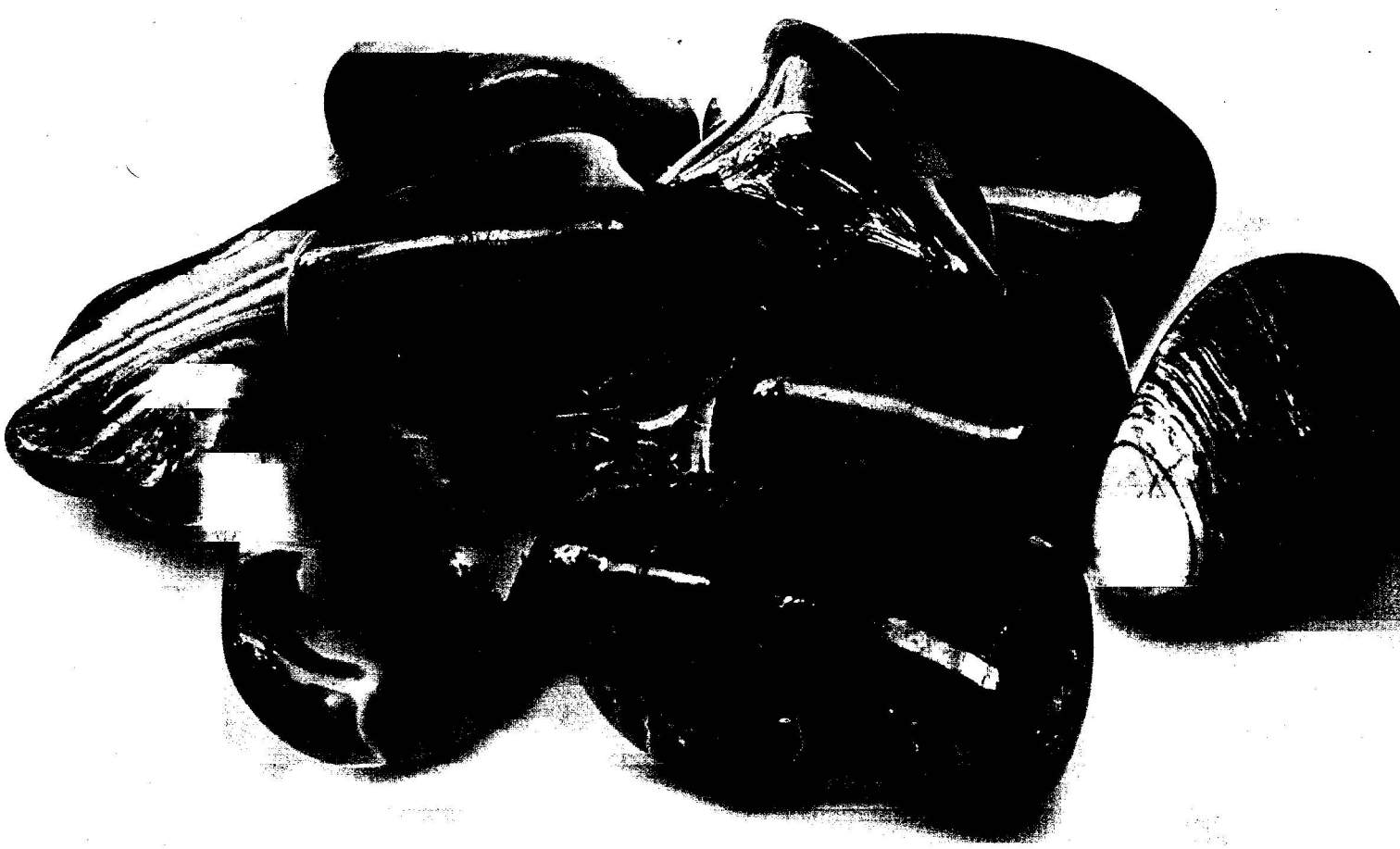
Vol. 84
(joint volume)

INTERNATIONAL SYMPOSIUM

MINERALOGY and GEODIVERSITY

Dedicated to:
The 70th anniversary of Prof. Dr. Emil Constantinescu

BUCHAREST 30 - 31 OCTOBER 2009



Institutul Geologic al României
Bucureşti - 2009

UNIVERSITY of BUCHAREST
Faculty of Geology and Geophysics

Geological Society of Romania

The marine microfossil record of past climatic changes in Eastern Mediterranean

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This work represents a review of the possible (micro) paleontological signatures of Milankovitch-scale climatic changes, recorded in past deep-sea sediments of Eastern Mediterranean.
It is well documented that climatic events are recorded in detail in the Mediterranean successions. This is due to the semi-enclosed character of the basin that yet favours the influence of local factors, modifying the effects of global changes.
In particular, because of its peculiar latitudinal position and its land-locked configuration, the Mediterranean is especially sensitive to astronomically induced climatic variations, which are well documented in its sedimentary record. Since the Mediterranean is involved in the deposition of eolian dust from the Sahara during dry periods, whereas riverine detrital input prevails during wet ones, the Mediterranean marine sapropel-bearing sequences provide high-resolution climatic information. These data have been employed in reconstructing astronomically calibrated time scales for the last 9 Ma of the earth's history. Furthermore, the exceptional accuracy of these paleoclimatic records improved our knowledge of the earth's orbital variations in the past.
Any organic rich layer of sediment is called a sapropel. Sapropels in the Mediterranean Sea are very interesting however because the Mediterranean is one of the least productive bodies of water today, and sediments there are extremely depleted in organic carbon. A very long historical record of sapropel deposition was collected by the Ocean Drilling Program Legs 160 and 161. Sapropels were first discovered in the Eastern Mediterranean Sea, but ODP found them to be synchronous in both basins.
Sapropels represent a scientific problem as yet unsolved. The discovery of strong paleontological and geochemical similarities in the Quaternary, Pliocene and Miocene sapropels suggest the occurrence of the same mechanism that led to the deposition of these anoxic layers in different geochronological intervals. Sapropels contain higher cell numbers and activities than carbon-lean intermediate layers demonstrating the presence of active microbial communities
Speculations about the origin of sapropels are often based on the interpretation of the fossil assemblages. However, we observed that the interpretation of ecological requirements of the microfauna and/or microflora occurring in sapropels in many cases is not clear. The probable cause of this fact is the lack of a conclusive understanding of modern assemblages.
Foraminiferal record has been proved to be an excellent tool to describe past climatic variations in global and regional climate and to resolve the existing dispute concerning sapropel provenance. Sea surface temperature and isotopic record derived from the microfauna record revealed several large and small scale climatic fluctuations. In particular, the distribution pattern of the planktonic foraminifera species are usually analyzed and used for the orbital configuration of the climatic changes and the sedimentary cyclicity characterised an outcrop or a core.
High resolution planktonic foraminiferal records are presented in order to reconstruct the climatic history of the Eastern Mediterranean basin the last 10 myrs. Sea Surface Temperature (SST) is constructed based on warm versus cold water indicators. Furthermore and in order to establish variations observed in Eastern Mediterranean proxy records and the possible influence of astronomical forcing, a spectral analysis is carried out using the periodicities of the Earth's orbital cycles.