

GÖLMARMARA LAKE (EASTERN AEGEAN REGION): LATE HOLOCENE ENVIRONMENTAL CHANGES

Ozlem Bulkan Yesiladali¹*, M. Namik Yalcin¹, Heinz Wilkes² and Lisa Doner³

¹ Istanbul University, Department of Geological Engineering, Avcılar, Istanbul, Turkey - bulkan@istanbul.edu.tr

² GeoForschungsZentrum Potsdam, Section 4.3, Telegrafenberg, D-14473 Potsdam, Germany

³ Istanbul Technical University, Eurasia Institute of Earth Sciences, 34469 Maslak, Istanbul, Turkey

Abstract

Gölmarmara Lake's sedimentary record has been investigated by multi-disciplinary approaches, to define environmental and climatic changes during Late Holocene in Eastern Aegean Region. For this purpose two 1.5m long cores were taken from two different depocenters of the Gölmarmara Lake. Along the cores different intervals were distinguished based on lithological, sedimentological properties, type and amount of organic matter and carbon isotopic composition of organic matter. These variations were then used to reconstruct the Late Holocene evolution of the lake system.

Keywords : *Organic Matter, Sedimentation, Aegean Sea.*

It's known that, even unremarkable changes in climatic, hydrologic, tectonic, volcanic processes are recorded in lake sediments. Although there are a number of recent lake systems in Western Turkey, only a few of them are studied in detail, to investigate this kind of paleo-environmental and paleo-climatic changes during Holocene. One of the less studied lake systems is the Gölmarmara Lake (Manisa). Formation age of the Marmara Lake is reported as Holocene [1], but its exact age is not determined by analytical investigations, yet. It is known that a number of old lake basins, close to the study area (around Salihli-Akhisar-İzmir), existed between Neogene and late Pliocene/late Pleistocene time period. Comparison of the Gölmarmara Lake system with these old lake systems will be one of the most useful approaches not only to understand past (Cenozoic) environmental and climatic conditions, but also to define probable changes of them at recent future in Eastern Aegean Region.

To investigate paleo-climatic and environmental changes during Holocene in Eastern Aegean Region, two different depocenters of the lake were cored by hammer coring techniques. These two cores are approximately 1.5m long and one of them (H3) is taken from the western depocenter of the lake and the other (H5) is from the eastern depocenter. Preliminary analytical result of the H3 core will be presented in detail.

Interpretation of the analytical results indicated that there are two different intervals along the H3 core (Fig. 1).

amount of (TOC: $\leq 0.5\%$), terrestrial (HI: 40-80 mg HC/ g TOC) organic matter. These intervals are also identified by carbon isotopic composition of organic matter and macroscopic investigations such as lithology and sedimentological properties. These variations are interpreted that the sedimentary sequence of 115-150cm is affected by oxidation processes whereas the interval above is deposited in a shallow lake environment. Furthermore variations in mineralogical composition, amount and type of organic material in sediments and carbon isotopic composition of organic matter will be discussed both in terms of environmental changes in the lake system and also of external effects such as climate, tectonics and hydrology.

Acknowledgements

This study is supported by Istanbul University Scientific Research Project Funding (project number: T-681/30062005). We would like to thank to The Marmara Research Centre of Scientific and Technological Research Council of Turkey (TUBITAK-MAM), Eastern Mediterranean Centre for Oceanography and Limnology, Turkey, (EMCOL) and Julich Research Centre, Germany for providing the laboratory facilities.

Reference

Hakyemez, H. Y., Erkal, T. and Göktaş F., 1999. Late Quaternary evolution of the Gediz and the Büyük Menderes Grabens, Western Anatolia, Turkey. *Quaternary Science Reviews*, 18: 549-554.

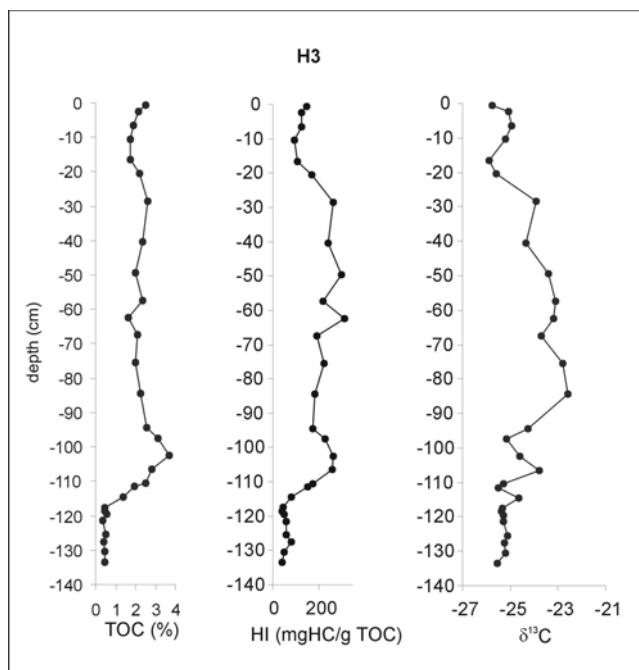


Fig. 1. The type, amount and carbon isotopic composition variations of organic matter along the H3 core.

First one is 0-115cm interval, which contains relatively high amount of (TOC: 1.4%-3.7%), mixed (HI: 82-315 mg HC/ g TOC) organic matter. The second is 115-150cm interval, which is characterized by less