

# Accepted Manuscript

The effect of heavy metal pollution on foraminifera in the Western Marmara Sea (Turkey)

Zeki Ünal Yümün



PII: S1464-343X(17)30031-6

DOI: [10.1016/j.jafrearsci.2017.01.023](https://doi.org/10.1016/j.jafrearsci.2017.01.023)

Reference: AES 2789

To appear in: *Journal of African Earth Sciences*

Received Date: 12 December 2016

Revised Date: 12 January 2017

Accepted Date: 18 January 2017

Please cite this article as: Ünal Yümün, Z., The effect of heavy metal pollution on foraminifera in the Western Marmara Sea (Turkey), *Journal of African Earth Sciences* (2017), doi: 10.1016/j.jafrearsci.2017.01.023.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Zeki Ünal YÜMÜN

\*Namık Kemal University, Çorlu Engineering Faculty, Çorlu, Tekirdağ, TURKEY / zyumun@gmail.com

## ABSTRACT

The aim of this study was to investigate the effects of heavy metals on foraminiferal assemblages in Holocene sediments in the western Marmara Sea. Accordingly, four drilling samples, one in Bandırma (Balıkesir/Turkey), two in Erdek Bay (Erdek-Bandırma/Turkey) and one in Tekirdağ (Turkey). Samples of cores taken from 43 different locations in the western Marmara Sea also have been examined. Changes in heavy metal concentrations were determined (spatially) in the vertical direction by means of drilling samples in the vertical direction for geochronology and in the horizontal direction by the areal distribution of the core samples, and foraminiferal assemblages were identified. In order to summarize the results of geochemical analyses, an average value defined as Pollution Index (PI) was used for the first time in this study. In this method, the pollution index value is obtained by dividing the sum of average value ratios of heavy metal measurement values by the number of measurements. The obtained index value was correlated separately with the numbers of foraminifer individuals and species. It was observed that the number of individuals and species decreased where the heavy metal measured values (MV) were higher than the pollution index and increased where the heavy metal values were lower than the pollution index. It was also observed that foraminifera were completely absent in some locations where PI was less than MV. Morphological changes were observed in *Elphidium crispum*, *Massilina secans*, and *Ammonia compacta* foraminifer species in the core samples taken in areas where industrial wastes are discharged into the southern parts of the Marmara Sea. No foraminifer species were observed at some locations where the heavy metal density was high (between Misakça-Denizkent, and Erdek-Balıkesir). The pollution index (PI) value measured in this area was higher than the critical value, indicating that heavy metal concentrations affect the habitats of foraminifera.

**Keywords:** Heavy metals, Marmara Sea, Erdek, Çanakkale, Tekirdağ, Foraminifera

Download English Version:

<https://daneshyari.com/en/article/5785700>

Download Persian Version:

<https://daneshyari.com/article/5785700>

[Daneshyari.com](https://daneshyari.com)