Geochemistry of Mn anomalies in the surficial bottom deposits of the Sea of Marmara

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Six box-cores, one boomerang core, and two hundred-nine grab samples were collected during the 1984, and 1988-1990 cruises of R.V. *Bilim* and the 1988 cruise of R.V. *Knorr* across the Sea of Marmara (Fig.1) in an attempt to establish the metal levels in the surficial sediments and the factors controlling their distribution within the basin; these were analyzed for grain-size distribution and organic carbon, carbonate and metal contents.

The sediment composition varies regionally and in response to textural variations and the heavy metal composition of sediment samples, determined for Fe (0.42-6.31%), Ni (6-161 ppm), Zn (20-180 ppm), Cr (5-174 ppm), Co (7-30 ppm), Cu (6-92 ppm), and Pb (8-94 ppm), can be largely explained by admixture of terrigenous components of variable composition and biogenic components poor in metal contents (BODUR M.N. and ERGIN M., 1991). The usually high concentrations of metals studied occur in the fine-grained sediments. Mn (152-9127 ppm) was found to be enriched in the deep-sea sediments of Marmara Trough (Figs. 2 and 3) over the possible contributions from terrigenous sources and the results indicate that there is no significant hydrothermal contribution of Mn to the sediments. In particular, the enrichment of Mn in the surface layers and the downcore changes of color from reddish-brown to greenish-grey is interpreted as reflecting the postdepositional remobilization/precipitation processes as a result of redox changes within the sediment column. The interelement relationships in the sediments indicate similar sources for all the metals analyzed, except for Mn, that seems to be enriched owing to the diagenesis and hydrogenesis within the oxygen-depleted deep basins of the Sea of Marmara.

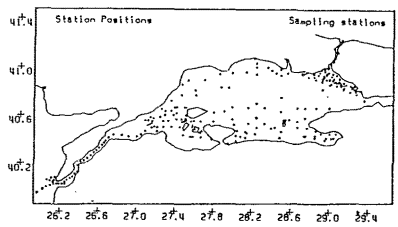

Fig.1. Sampling stations for surficial sediments in the Sea of Marmara.

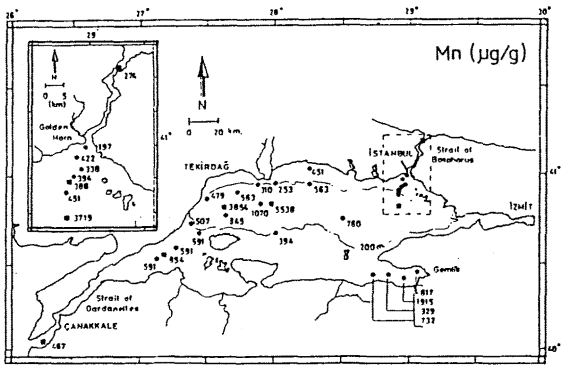

Fig. 2 . Distribution of Mn concentrations in the surficial Marmara sediments.

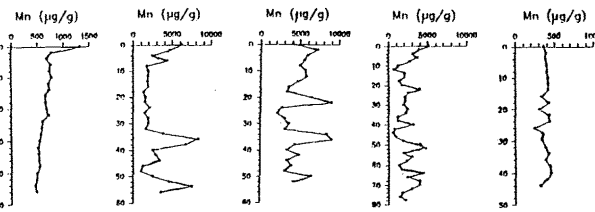

Fig. 3 . Downcore distribution of Mn concentrations in the Recent sediments across the Sea of Marmara, towards the Aegean Sea (left) and Black Sea (right) exits. Note the high Mn contents in deep-sea sediments.

REFERENCES

BODUR M.N. and ERGIN M., 1991.- Heavy metal geochemistry of surficial bottom deposits from the Sea of Marmara. *Manuscript submitted to Marine Geology.*