GEOCHEMISTRY OF SURFACE SEDIMENTS FROM STRYMONIKOS BAY, NORTHERN AEGEAN SEA

by

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37 sea-bed sediments from Strymonikos Bay, were analysed fo SiO_2, Al_2O_3, Fe_2O_3, MgO, CaO, K_2O, TiO_2, Ni, Cu, Zn, Pb, total organic matter and $CaCO_3$(fig. 1). The chemical analysis was carried out by X-ray fluorescence spectrometry. All samples were analysed in duplicate and the accuracy was ckecked by analyses of intern.standars. Total organic matter was determined by H_2O_2 oxidation and calcium carbonate by HCl attack (CARVER, 1971).

Total organic matter concentration is high in the samples taken from the area around the outfall of the domestic sewage of Asprovalta ($>2\%$). At most of the other stations total organic matter varies between 0,2% and 2%. At some of these stations the total organic matter concentration is attributed to the organic matter transported into the bay by the rivers.

Calcium carbonate concentration ranges between 2% and 40% and is due mainly to the carbonate skeletal fragments of living organisms. Along the eastern coast of the bay the calcium carbonate concentration is attributed primarily to the erosional products of the Neogene and Quaternary deposits and marbls of the land.

The concentration of SiO_2 varies from 44% to 84% with the highest concentration found along the coasts in sands rich in terrigenous clastic material. The lowest concentrations were found in the central and deeper areas of the bay which are covered by mud (CONISPOLIATIS, 1984).

The concentration of Al_2O_3, Fe_2O_3, TiO_2 and Ni vary between 7% to 20%, 0,2% to 7%, 0,03% to 0,59% and 4 to 110 ppm, respectively. The highest concentrations were found towards the central and deeper areas of the bay, while the lowest concentrations were along the coasts.

An examination of the interelationship between Al_2O_3 and Ni concentrations at each station shows that there is a linear correlation probably suggesting a common lithological derivation (COSMA et al., 1982).

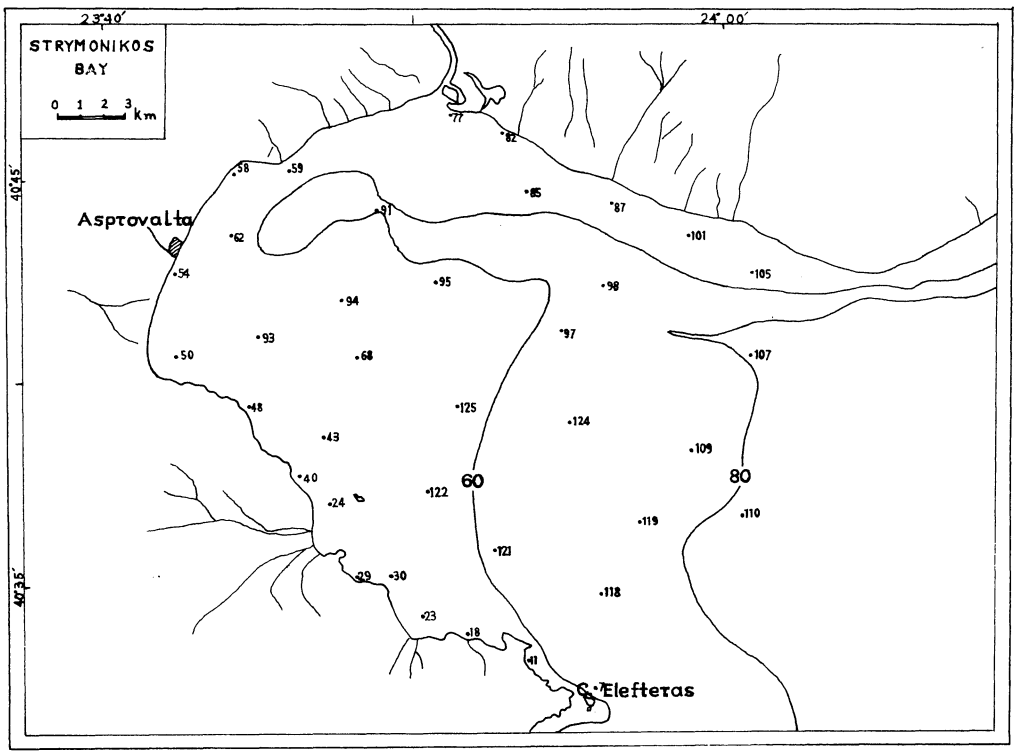

Fig. 1 .

The distribution of K_2O and MgO is generally uniform all over the area sampled.

An examination of the interelationship between Al_2O_3-Cu concentrations at the stations examined shows that there is a positive correlation between the above-mentioned elements at all the stations except at stations 58,54,62 which are near Asprovalta. This shows that there is an anthropogenic input of Cu.

Pb and Zn show a different distribution pattern from that of Al_2O_3 The highest concentrations of Pb (>200 ppm) are found along the coast of the cape Elefteras and are associated with the onshore mining activity. The highest concentrations of Zn (>220ppm) are observed in the areas near the cape Elefteras, as well as further offshore. The difference in the distribution patterns between Pb and Zn is due mainly to the fact that Zn is more mobile than Pb.

In comparison to other geochemical studies on sea-bed sediments from various Greek bays and areas of the Aegean (Varnavas et al. 1984 and 1984, Smith and Cronan 1975), the sediments of Strymonikos Bay are characterized by the highest concentrations of Zn and Pb which are due to the mining activity in the sulfides ores (B.P.G.) of Stratonikis area.

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