

²¹⁰Po AND ²¹⁰Pb IN THE TURKISH COAST OF THE AEGEAN SEA ECOSYSTEM

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Abstract

Samples of sea water, coastal sediment and other organisms have been collected from Turkish Coast of the Aegean Sea. Concentrations of ²¹⁰Po and ²¹⁰Pb in all the samples were analyzed by the chemical method and alpha counting technique. This paper presents the results of these investigations and compares them with Mediterranean marine radioactivity levels reported by others

Keywords : *Aegean Sea, Sediments, Fishes, Mollusca, Radionuclides.*

It is very well known that the importance of the protection of the marine environment for sustainable development and economy of coastal countries, like Turkey.

So far, the background radioactivity in the marine coastal environment of Turkish Coast Aegean Sea has not been studied very extensively. Since the coastal area is well develop, with beaches being utilised for recreation and also as large amounts of fish and seafood are harvested from the coastal water, the study of radioactivity in this area is of great interest.

The present work reports on an investigation carried out into concentrations of ²¹⁰Po and ²¹⁰Pb in marine environmental samples collected from near-shore region of the Turkish Aegean Coast.

The Aegean Sea, arm of Mediterranean Sea, 640 km long and 320 km wide and having a surface area approximately 214 000 km² is located off SE Europe between Greece and Turkey, Crete and Rhodes mark its southern limit. The Aegean Sea greatest depth is 2500m. The Dardanelles strait connects the Aegean Sea with the Sea of Marmara and Black Sea.

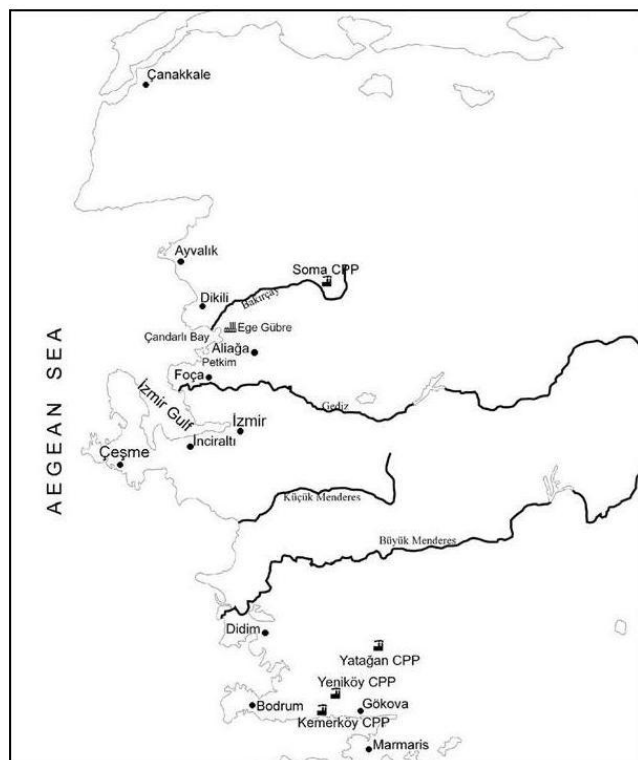


Fig. 1. Map of sampling locations.

The Turkish coastal zone of the Aegean Sea has been heavily industrialized in the last 25 years resulting in a considerable input of wastes to the coastal marine ecosystem. Fish and other edible marine organisms consumption is relatively higher in the region than at other parts of Turkey. Therefore it is important to determine the additional dietary radiation dose received by population originating from seafood. The information on levels and on distribution of natural radionuclides is however sparse due to limited number of investigations conducted on this coast line (Uğur,

Yener & Başarı, 2002; Tanbay (Uğur) & Yener, 2001; Tanbay (Uğur) et al., 1999).

Six sampling location (Çanakkale, Dikili, Foça, Çeşme, Didim and Bodrum) were selected and indicated in Figure 1. Sediment samples from the locations were recovered using a Van-Veen grab (5 lt) near the shore of the stations. In the case of sea water, samples of ?l were collected and filtered through 0.45µm filters and acidified before analysis. Fish samples were collected from the fresh catch sold in the local market. Mussels (*Mytilus galloprovincialis*) were also taken from the same sampling stations. ²¹⁰Po spontaneously deposited on copper disc was counted in an alpha spectrometer containing a PIPS detector.

In the bottom sediments, ²¹⁰Po concentration varies between 21±1 and 214±24 Bq kg⁻¹ dry wt with an average value of 70±7 Bq kg⁻¹. The concentrations in surface water of the sea during the sampling period are around 0.016±0.001 Bq l⁻¹. Amongst the fishes, small pelagic plankton feeding fish like anchovy (*Engraulis encrasicolus*) and sardine (*Sardine plichardus*) tend to accumulate more ²¹⁰Po. The concentration of ²¹⁰Po in mussels (*Mytilus galloprovincialis*) varies between 55±5 and 2288±124 Bq kg⁻¹ which is in general higher than those given in literature for other countries. The highest ²¹⁰Po concentration belongs to Didim mussels for winter time with a shell length of 4-6 cm.

Acknowledgements

This research work is supported by grants from International Atomic Energy Agency, IAEA Research Contract No: 302-K4.00.24-TUR-12641, B5-TUR-31834.

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