# *VARIATIONS OF METAL AND HYDROCARBON CONCENTRATIONS IN SURFACE SEDIMENTS OF THE NORTHEASTERN MEDITERRANEAN*

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## *ABSTRACT*

*While inorganic matter at the seafloor is carried by the river and flood waters, organic matter accumulated on the sediment is derived from terrestrial inputs and detritus of the primary and secondary production in the sea. Enhancement of the organic and inorganic matter in the coastal zone is one of the most precise pollution indicators. Eutrophic coastal zone of the Northeastern Mediterranean, including Mersin and Iskenderun Bays, is one of the regions, where higher concentrations of polycyclic aromatic hydrocarbons (PAHs) and metals are found. In the scope of National integrated Marine Pollution Programme (ÇŞB/ÇEDİDGM-TÜBİTAK/MAM; 2014-2016), in order to determine current status of the PAH and metal pollution in the Northeastern Mediterranean, 11 surface sediment samples were collected in 2014 and 2015 summer and their chemical analyses were performed. Regional variations of concentrations were depicted and by using previous results, which are accurate and acceptable, temporal variations were examined.*

*PAH and metal measurements were performed according to the recent pollution analysis techniques optimized in the last 15 years. Long-term data sets were evaluated by using reference values for the study region with the assumption of the low temporal variability. According to recent results in the study region, total PAH (tPAH) concentrations were higher in Mersin-Goksu region and minimum values were observed in Iskenderun surface sediments. tPAH concentrations varied between 0.47 and 0.78 μg/g in Iskenderun inner bay and Mersin bay where petroleum transportation activities were observed; values were about 6-10 fold higher compared to the reference values. When the results of the metal pollution were examined, maximum concentrations of Cd and Hg were observed in Mersin region and maximum Cr concentrations were measured in Iskenderun region. Surface sediments located in Mersin Bay generally have higher concentrations of Pb and Zn. Lower concentrations of Cr, Zn and Al were measured in Goksu Region. According to variations exceeding experimental error, surface sediments in coastal area of the Mersin Bay occasionally have higher concentrations of Cd and Zn. Particularly, metal pollution in Iskenderun inner bay were increased due to metal industries in the region. According to the reference values and enrichment factors, about 2-5 fold increase was observed in Cr and Zn concentrations. Higher Cr values and its regional variations were observed in the study region considering the natural inputs into the Eastern Mediterranean. The Hg values were observed in surface sediments of the coastal zone (Iskenderun and Mersin inner bay, Karataş, Taşucu-Goksu) fed by river and terrestrial inputs.*

*Due to increase in port activities and petroleum transportation, PAH and metal pollution in coastal zone have arisen concerns. According to a recent study, a positive relationship between TOC and Pb concentrations was found in the surface sediments. Developing eutrophic conditions and the accumulation of TOC at the seafloor can potentially lead to rapid accumulation of organic/metal pollutants and thus leading to accumulation of pollutants in the food chain by benthic/demersal organisms. It is very critical that systematic data sets should be developed for the precise assessment of spatial and temporal variations with carefully selected stations and study depths by using standardized methods and reference materials. Thus, after obtaining systematic data sets, it is possible to perform action plans for assessing threshold values for the regional pollution, the source assessment of the terrestrial pollutants and their impacts on the marine environment, and minimizing pollution loads of the sources.*

***Keywords:*** *Pollution, Northeastern Mediterranean, Metals, PAH, Sediment*