PAH/PCB CONCENTRATIONS IN MUSSELS (*MYTILUS GALLOPROVINCIALIS*) FROM IZMIT BAY

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Abstract
PAH and PCB concentrations were determined in mussel samples collected from Izmit Bay at the east of marmara Sea. The samples were taken from ten points in spring season and analyzed by gas chromatography after ultrasonic extraction. Total PAH concentrations varied between 2.5-13.9 ng.g-[1] wet wt., while the total PCB concentrations were between 4.2-140.7 ng.g-[1] wet wt. The results indicates a considerable pollution problem in the bay, especially with respect to PCBs.
Keywords: Pah, Pcb, Bivalves, Marmara Sea

Introduction
Izmit Bay, located in Northeastern Marmara Sea, has strongly been affected by growing populations and industrialization since 1960s. The study presents the first results of PAH/PCB analyses in the mussel samples in the framework of a pollution monitoring project in Izmit Bay.

Materials and Methods
Mussel samples were taken from ten different points in Izmit Bay in spring season (April 2008). Ultrasonic extraction was used to extract the PAHs and PCBs from the mussels samples. At least 30 mussels were dissected and soft parts selected for analysis. The samples were cleaned up on an alumina–silicic acid column containing 3 g of silicic acid (deactivated with 3% water) and 2 g of alumina (deactivated with 6% water). After treatment with sulfuric acid, the final sample volume was adjusted to 1 ml by nitrogen blow-down. The two fractions containing PAHs and PCBs were analyzed using a Hewlett-Packard 7890 gas chromatograph equipped with an flame ionization detector (for PAHs) and an electron capture detector (for PCBs).

Results and Discussions
Results were summarized in Fig. 1-2.

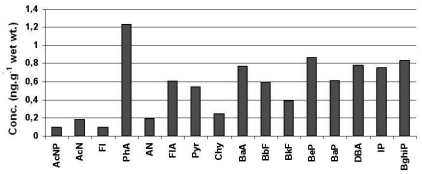

Fig. 1. Average PAH concentrations in mussels.

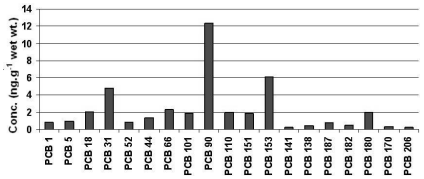

Fig. 2. Average PCB concentrations in mussels

Mean mussel shell length were determined 5.26 cm among ten stations. Total PAH concentrations varied between 2.5-13.9 ng.g^{-1} wet wt., with the average of 8.8 ng.g^{-1} wet wt. Relatively dominant PAH compounds were found as phenanthrene, benzo(e)pyrene and benzo(ghi)perylene. The mussel PAH levels were generally similar (higher than 7 ng.g^{-1} wet wt.) for the sampling points, with the exception of two points located on the north side of the Bay (with PAH levels about 2-3 ng.g^{-1} wet wt.). These results are interesting, because these two points are close to the refinery and other possible PAH sources. This may be attributed to the effect of water circulation patterns in the Bay, as given in a previous study [1]. On the other hand, observed PAH concentrations are in the range of the levels obtained in the mussels from similar polluted water bodies [2].
Total PCB levels, on the other hand, were between 4.2-140.7 ng.g^{-1} wet wt., producing an average of 42.1 ng.g^{-1} wet w. For PCBs, PCB 90, PCB 153 and PCB 31 were the dominant congeners. The highest PCB levels were observed in the points on north and east side of the Bay, suggesting a clear effect of industrial discharges. Mussel PCB levels were relatively high as compared to other studies conducted in Izmit Bay and Marmara Sea [1, 3].
A general evaluation of total PAH/PCB data from all the stations indicates that the pollution levels are considerably high not only at the points close to possible sources, but also the points away from these sources, possibly due to the effects of oceanographic and meteorological factors.

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