

Salihoğlu, G., N.K. Salioglu, E. Aksoy and Y. Taşdemir (2011) Spatial and temporal distribution of polychlorinated biphenyl (PCB) concentrations in soils of an industrialized city in Turkey. *Journal of Environmental Management* Vol.92 (3):724-732.

#### ABSTRACT

Surface soil (0-5 cm) samples from 43 sampling sites covering the entire urban territory of Bursa, an industrialized city in Turkey, were collected in each season and analyzed for 83 polychlorinated biphenyls (PCBs). The mean concentration of total PCBs ( $\Sigma 83$  PCBs) among all sites over the four seasons was 2121.51 pg/g dry weight (dw), with a range of 207.61-5461.95 pg/g dw. Total PCB concentrations in the soil samples collected near an industrial region were the highest in all seasons. In general, PCB patterns were dominated by low-chlorinated homologue groups ( $\leq 5$  Cl groups at a 79% level). The predominant homologue group found in Bursa city soils was the penta-CBs (29.1%) followed by the tetra-CBs (25.5%) and tri-CBs (17.6%). A total of seven dioxin-like PCB congeners (CB-77, 81, 105, 114, 118, 123, and 126) were found in every sampling location and their mean total concentration for all locations and seasons was 259.27 pg/g dw, with a range of 7.02-1581.13 pg/g dw. A significant relationship ( $r = 0.77$ ,  $p < 0.01$ ) was found between the concentrations of dioxin-like PCBs and the seasonal average sum of PCB concentrations. A correlation between light congeners ( $<$ penta-CB) and total organic carbon (TOC) was not observed, whereas a significant correlation ( $r = 0.36$ ,  $p < 0.05$ ) for heavy congeners ( $\geq$  penta-CB) and TOC was found. The pollution potential was assessed based on the values found in soils in different regions in relation to current guideline values. Overall, it was found that PCB levels in the urban soils of Bursa were much lower than both the target values and the values found in most European soils and other regions.