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## **Heavy Metal Concentrations in Some Bivalve Species from the Southern Coast of the Marmara Sea (Turkey)**

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**Objective:** In this study, concentrations of three heavy metals (Cd, Hg and Pb) were determined some bivalve species: oyster (*Ostrea edulis*), wedge clam (*Donax trunculus*) and manila clam (*Ruditapes philippinarium*) from the southern coast of the Marmara Sea, Turkey. Samples were collected seasonally by diving into several natural beds of littoral zones from three locations between 2013 and 2014.

**Methods:** For Cd, Hg and Pb determination, about 20–30 specimens from each species were homogenized by an Ultra-Turrax DI 25 dispersing device. All dissection equipment, plastic and glassware were cleaned by soaking in 10% v/v HNO<sub>3</sub> for 24 h and then rinsed with Milli Q water to avoid contamination. Cadmium

and lead were determined by Graphite Furnace Atomic Absorption Spectrometry. Mercury was determined by the hydride technique. Two grams of homogenized bivalve sample material were digested with 8 ml HNO<sub>3</sub> (65%) and 2 ml of H<sub>2</sub>O<sub>2</sub> (30%), in a closed Teflon vessel using a MARS 5 microwave oven at 200 psi with 25 min ramp time to 210 °C at a maximum power of 300 W and 10 min hold time. After mineralization, digests were cooled and diluted to 25 ml with Milli Q water and stored in polyethylene bottles until analysis. Measurements were performed in triplicate. The wavelengths monitored were 228.80 nm for Cd, 53.65 nm for Hg and 283.30 nm for Pb. Limits of detection (LODs) were 1.15 mg/kg for Cd, 50.28 mg/kg for Hg and 11.42 mg/kg for Pb. Limits of quantification (LOQs) were 3.80 mg/kg for Cd, 166.02 mg/kg for Hg and 37.68 mg/kg for Pb. The following relations were used:  $LOD = 3 s_b/m$  and  $LOQ = 10 s_b/m$ , where  $s_b$  is the standard deviation of the blank response ( $n=5$ ) and  $m$  is the slope of the calibration curve for each element.

**Results and Discussion:** The heavy metal levels of bivalves were found in the following ranges: Cd 0.03–1.12, Hg<LOD–0.14 and Pb 0.07–0.62 mg/kg. Among the reported metal levels, only Cd (1.12 mg/kg) in oysters in one stations exceeded the maximum critical concentrations enforced by Turkish legislation and European Commission. In conclusion, future monitoring programs should follow these changes in these metals.

**Keywords:** *Ostrea edulis*, *Donax trunculus*, *Ruditapes philippinarium*, heavy metal.

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