GRANULOMETRIC AND ORGANIC MATTER DEPENDENCE OF PB AND CD ACCUMULATION IN SEDIMENTS FROM THE KASTELA BAY (SPLIT, CROATIA)

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As investigation on trace metals in sediments are part and environmental of pollution control, the comparability of the results obtained is an indispensable prerequisite for trace metals monitoring. Therefore, trace metal concentrations have been determined in separate fraction (BROOK *et al.*,1988, MARTINCIC *et al.*, 1990, SCHNEIDER *et al.*, 1984) and in whole sediment and correlated with percentage of fine grained fraction (DONAZZOLO *et al.*, 1981). Sediment samples were collected at six stations in the Kastela Bay. The cores were divided into subsamples (5 cm long), and the subsamples were fractionated by wet sieving technique. The following sediment fractions were analyzed : 20–54 µm and <20 µm. Organic matter and trace metals (Pb and Cd) concentrations are determined in these fractions, as well as in the unsieved sediment samples. Electrothermal atomic absorption spectrometry was used for Pb and Cd concentrations. Linear regression method was applied for statistical purposes. The distribution of Pb in analyzed fractions of sediment show that it is significantly associated with smaller size particles, whereas Cd does not show such distribution (Fig. 1).

a)	Pb	Cd	b)	Pb	Cd
r	0.605	0.115		0.445	0.246
P	0.006	0.785		0.057	0.692
b	1.281	0.000		0.327	0.000

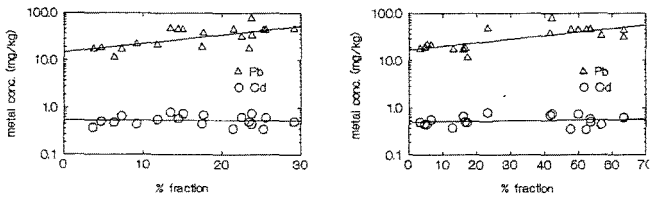

Fig. 1. Linear relationship between metal concentrations in whole sediment and percentage of fraction 20–54 µm (a), < 20 µm (b); r = correlation coefficient; P = significance; b = coefficient from equation y = bx + a.

From correlation coefficients, it might be concluded that the levels of Pb in various fraction of the sediment from the Kastela Bay are controlled by organic matter content in the same fraction, and Pb is chemically associated with various phases of organic matter present in the sediment, while, it is unlikely in the case of Cd (Fig.2).

a)	Pb	Cd	b)	Pb	Cd
r	0.657	0.501		0.769	0.593
P	0.034	0.269		0.009	0.228
b	3.840	0.005		4.662	0.006

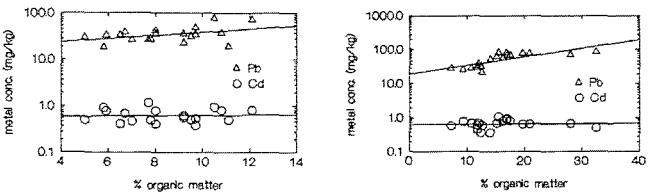

Fig. 2. Linear relationship between metal concentrations in each fraction and organic matter content in the same fraction: 20–54 µm (a), < 20 µm (b); r = correlation coefficient; P = significance; b = coefficient from equation y = bx + a.

Lead and Cd concentrations in the sediment is far less affected by fraction content than by organic matter content (Fig. 1 and 2). In all sediment layers, Pb and Cd concentrations increase with increase of organic matter, particularly in the fine–grained sediment fraction (< 20 µm). Lead concentrations in the sediment is surface sediment (0 – 5 cm)is two times higher compared to Pb concentrations obtained in the sediment layer between 20 and 25 cm below the sediment–water interface. The concentrations of the metals in the deepest layer of the sediment was taken as background. The obtained concentrations of Cd are similar to the values early reported : means value Cd–0.405 mg/kg and Pb – 36.00 mg/kg, (VUKADIN *et al.*, 1982). Obviously Pb concentrations have increased in the past ten years.

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