Effects of weight and age on Cadmium and Lead levels in foot, gills and the rest of soft tissue of Mussel *Mytilus galloprovincialis*

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Natural levels of Cd and Pb in foot, gills and the rest of soft tissue were analyzed in ıussel *Mytilus galloprovincialis*, collected from unpolluted shelf breeding area ıistrina in the Bay of Mali Ston (eastern middle Adriatic). Three different age groups ⁄ere used (A, 1.0; B 1.5; C, 2.0 years).

The aim of this study was to establish the distribution of these metals between foot, ills and the rest of soft tissue as affected by the weight and age of organisms.

Cadmium concentration in foot of mussel from the natural environment was ›und to decrease with the increase of this organ mass (Fig. 1).

This was observed for all three ge groups (A, B, C), particularly ›r the youngest one. In contrast › the mass, age does not affect ıdmium concentration in mus-ıl foot.

The effect of foot mass on lead ›ncentration is more significant ıan in Cd (Fig.1). Pb concen-ations is decreased with greater ›ot mass in all age groups, ırticularly in age group A.

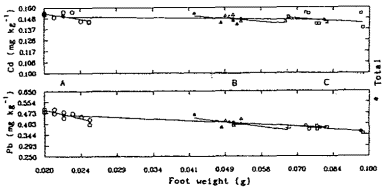

Fig.1. Log-log relation between metal concentration and foot wet weight

Apart from the tissue mass, lead concentration in foot (in contrast to cadmium) is e function of mussel age.

As distinct from foot, Cd ›ncentration in gills is gher if their mass is greater ig. 2). This was observed for l three age groups, ırticularly for the oldest one ') Cd concentration in gills ghtly increases with mussel ge.

Gill mass increase effect on › gills concentration is ıilar to that on Cd gills ncentration (Fig.2). Lead ıncentrations are also gnificantly affected by ıssel age.

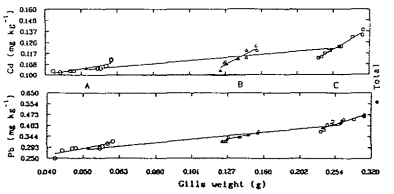

Fig.2. Log-log relation between metal concentration and gills wet weight

In contrast to foot and gills, in ıich the mass considerably ›ects cadmium and lead levels, › rest of soft tissue does not at l affect its Cd and Pb ncentrations (Fig. 3).

Cd concentration is very ghtly reduced and that of lead ry slightly increased with ıssel age.

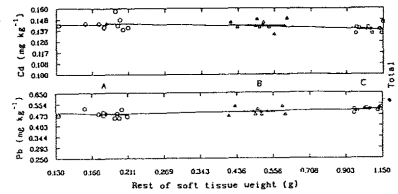

Fig.3. Log-log relation between metal concentration and the rest of soft tissue weight

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Mercury and Chromium in organisms of the coastal marine area between Po Delta and Ravenna Harbour

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Samples of marine sediments and organisms were collected in March 1990 from the coastal area of the Northern Adriatic Sea between Po River Delta and Ravenna Harbour (Fig. 1). In this area, influenced by Po River waters (BARALE *et al.*, 1986), a high deposition of fine materials takes place at a depth higher than 10 m, especially in winter (BORTOLUZZI *et al.*, 1984). Dredging materials from Ravenna Harbour are disposed in a rectangular dumping site (Fig. 1).

Table 1 shows the Hg and Cr contents in the superficial sediments of the studied area (GIANI *et al.*, 1992). Hg and Cr decrease from delta Po southwards. The maximum Hg concentration is in the harbour zone due to general pollution of the channel harbour and surrounded salt marshes caused by chemical plants (MISEROCCHI *et al.*, 1990).

The organisms collected were classified, weighed and their length measured. Muscle tissue of specimens of *Gobius niger jozo* (n=10), *Squilla mantis* (n=7) and soft tissue pools (1-8) of specimens of *Ostrea edulis* (n=17), *Crassostrea gigas* (n=45) and *Natica millepunctata* (n=8) caught in the different zones were digested in teflon bombs with nitric acid by a microwave digester. Hg was determined by CVAAS after reduction by SnC12 and Cr analysis was performed by GFAAS (Fig. 1 and Fig. 2). The recoveries with respect to MA-A-2 (TM) reference material were 100% for total Hg and 88% for total Cr.

Mercury. Hg values are low. There are no differences between the Hg levels in the same species caught in the different zones. *S. Mantis* and *C. gigas* seemed to be the better Hg-concentrating species. In *G. niger jozo* Hg increases with the total length but the values are five-fold lower than those reported by other authors for the same area and about *S. mantis* and *N. millepunctata* our data are lower than the ones too (CIUSA and GIACCIO, 1984). In *O. edulis* and *C. gigas* Hg concentrations are generally lower than the ones found in the Venezia Lagoon (PERDICARO, 1989). Chromium. The Cr letterature data are often not sufficient and not comparable. Fig. 1 shows higher Cr concentration in the bivalves and a gradual decrease from the specimens of the A-zone towards B and P-zone. This observation and the apparent Cr concentration decrease with the toal length of the *S. mantis* need further research.

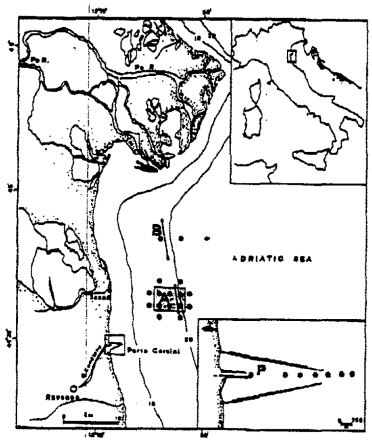

Fig. 1 - Study area and sampling stations (A : dumping-zone; B : Po-delta-zone; P : harbour-zone; O : sediments; -> : organisms).

TABLE 1 - Hg and Cr concentrations (µg/g d.w.) in surface sediments.

Zone	N° of samples	Hg Range	Hg Av. ± S.D.	Cr Range	Cr Av. ± S.D.
A	14	0.130-0.460	0.278 ± 0.102	123-162	135 ± 14
B	2	0.380-0.508	0.444 ± 0.064	161-171	166 ± 5
C	6	0.120-1.932	0.607 ± 0.653	92-124	113 ± 15

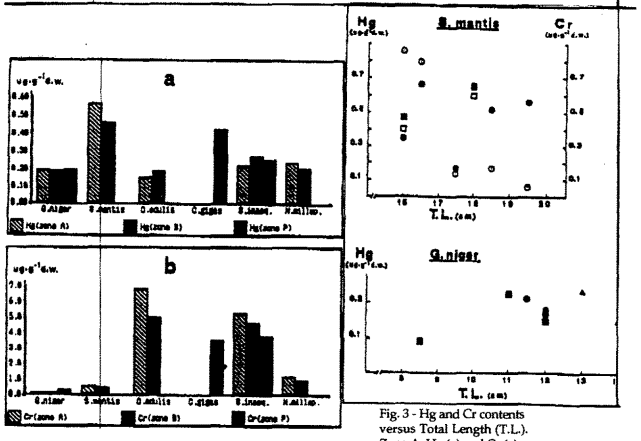

Fig. 2 - Hg average concentration (a) and Cr average concentration (b) in some species caught in the different zones.

Fig. 3 - Hg and Cr contents versus Total Length (T.L.). Zone A: Hg ( ) and Cr ( ). Zone B: Hg ( ) and Cr ( ). Zone P: Hg ( ).

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