

UPTAKE OF CADMIUM FROM WATER AND FOOD IN MUREX TRUNCULUS

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A previous study aimed to determine Cd concentration in *Murex trunculus* from different areas of North Tyrrhenian coast showed that, also in unpolluted marine waters, this gastropod can reach a high concentration of this metal.

In some marine areas of this coast, Cd is found only in *Murex* and not in other species (*Donax*, *Venus*, *Macra* and *Mytilus*) living in the same environment. Data on Cd levels in *Murex* were obtained by atomic absorption spectrophotometric methods (IL S11 spectrophotometer equipped with a deuterium lamp). The soft parts of *Murex* were first digested overnight in cold 65% nitric acid (Merck Suprapur) and subsequently in boiling acid in distillation vessels. The values of Cd concentrations are expressed in ppm dry weight. Reference standards of lobster hepatopancreas (National Research Council, Canada) were also processed in order to check the analytical accuracy. All the standards gave values inside the 95% range of the mean certified value.

The analytical data, in agreement with other authors (BOUQUEGNEAU, 1988), showed that the digestive gland is the target organ for Cd. From our data, this organ represents about 80% of the total metal body burden whereas a contribution of 2.5% is due to the gills. In order to get a further insight to the ways Cd is accumulated in *Murex*, two experiments were carried out in the laboratory.

In a first experiment, 16 animals were exposed to 150 µg/l of Cd administered as nitrate in seawater. In a second experiment, 20 animals were fed with mussels previously contaminated through a 6 weeks exposure to 150 µg/l of Cd in seawater. Every animal was fed with one mussel and received a load of about 50 µg of the metal.

In the *Murex* of the first experiment, a fast increase of Cd was observed in the gills whereas in the digestive gland, after 14 days of Cd exposition, the concentration of this metal was not significantly different from uncontaminated animals (Fig.1-2).

The data of the second experiment showed that at the 8th week after predation, the levels of Cd in the digestive gland were yet 10 times higher than the values measured in the controls. Moreover, this time, the loss of the metal from the digestive gland seems very slow. The gills showed an increase with a maximum value at the 3th week after predation to decrease subsequently. Cd accumulation in the gills is probably linked to the transfer of the metal from the digestive gland by the blood.

Therefore the digestive gland of *Murex* seems to take high load of Cd only when present in the food and not when the metal is present in dissolved form in seawater. Cd consumed with the food, on the other hand, is lost speedily by the digestive gland in the first weeks but subsequently the excretion, in agreement with data on other molluscs (VIARENGO, 1989), is very slow. This seems to indicate that the diet is the more important source of cadmium for *Murex trunculus*. An histological study was performed on the digestive gland in order to observe alterations at the subcellular level due to this toxic.

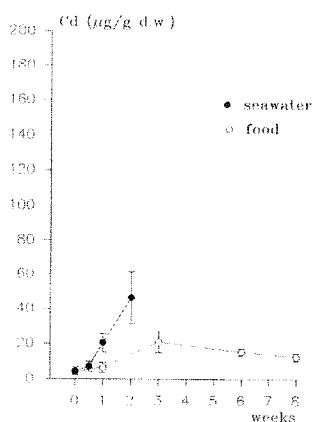


Fig.1. Cd in the gill of *Murex* exposed to contaminated sea water or food

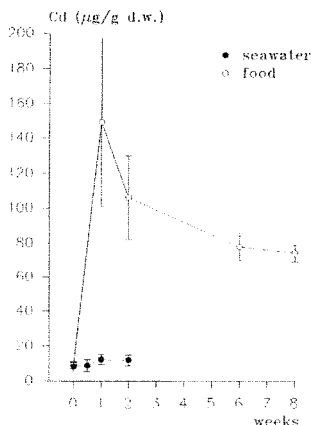


Fig.2. Cd in digestive gland of *Murex* exposed to contaminated sea water or food

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