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Lead compartmentation in Kidney Cell of *Murex trunculus* (Mollusca: Prosobranchia)

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The intracellular compartmentation of essential and xenobiotic metals is of great interest for improving our understanding of the normal metabolism of metals and of their mechanisms of cell injury (FOWLER, 1987). The role of a given compartment in the regulation of metal cations bioavailability depends on various factors such as cell type and species (FOWLER, 1987). The kidney of molluscs is a suitable material for studying the cellular mechanisms of metal homeostasis in non mammalian animals, due to its high capacity to concentrate metals (CARMICHAEL et al., 1980 ; GOLDBERG, 1986).

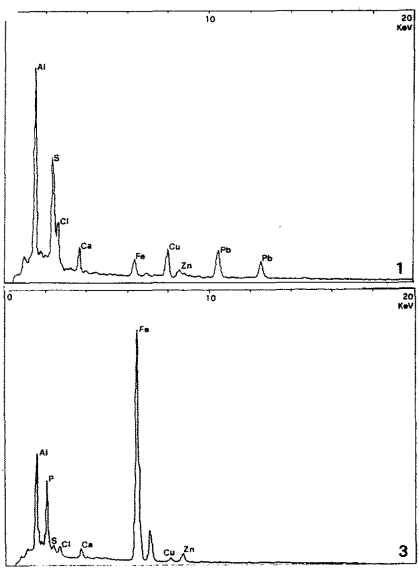
This paper reports preliminary data on Pb concentration and its intracellular localization in the kidney of *Murex trunculus* , a common predatory gastropod mollusc. The animals were collected in a heavily polluted marine area of the gulf of Follonica (North Tyrrhenian Sea). This area receives effluents from both industrial (production of TiO_2 and H_2SO_4) and domestic activities. Specimens of *Murex*, sampled in unpolluted waters of Sardinia (Porto Pozzo), were used for comparison. Metal concentration in the organ was measured by Atomic Absorption Spectrophotometry after wet digestion with HNO_3 in teflon vessels at 120°C. Accuracy of analytical procedures was checked with standard of *Homarus* (National Research Council Canada). Intracellular localization was revealed on chemically fixed material by Transmission Electron Microscopy and X-ray microprobe analysis.

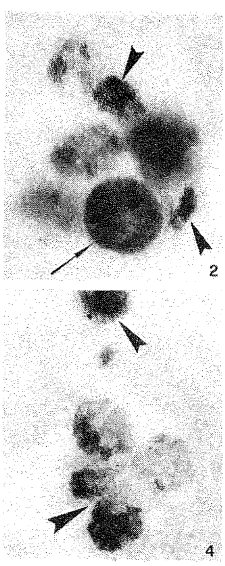
Renal concentrations higher than 700 ppm were measured in *Murex* from Follonica, whereas individuals from Porto Pozzo showed values lower than 1 ppm (dry weight). Kidney cells of *Murex* from Follonica showed a large number of lysosome-like inclusions (Fig. 2), containing an highly electrondense material and often homogeneous spherical bodies (0.4 - 0.6 µm in diameter) (Fig. 2 arrow). These inclusions contained also clusters of fine granules composed mainly by Fe (Fig. 2 arrow heads). X-ray microanalysis revealed that Pb was associated with the spherical bodies (Fig. 1).

Morphologically similar inclusions were seldom found in renal cells of *Murex* from Porto Pozzo (Fig. 4). However, these inclusions never contained lead (Fig. 3).

Cu and Zn were associated with the spherical bodies of *Murex* from both areas.

The values of Pb found in *Murex* from Follonica are remarkably higher in respect to literature data (DI CINTIO, 1986), indicating a very high lead pollution in this area. Our findings also confirm that this metal can be tolerated by molluscs in concentrations much higher than those found in normal tissues. This is probably due to the sequestration of lead within membrane bound lysosome-like bodies. This evidence supports previous data indicating these organelles as one of the major "sinks" for metal cations (FOWLER et al., 1975).





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