

# METALS AND POLYCYCLIC AROMATIC HIDROCARBONS DETERMINATION IN TRANSPLANTED MUSSELS IN THE SEASHORE OF SÃO PAULO STATE, BRAZIL

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Coastal regions are often used for the discharge of urban and industrial effluents, causing water pollution by several chemicals and interference in marine life. A world-wide increase in contaminant levels was verified, which lead to the search of strategies in order to lessen the impact of pollutants to the ecosystems. Polluted ecosystems may jeopardize the health of the local population in case of utilization of contaminated waters for fishing or leisure activities<sup>1</sup>.

Various coastal region contamination episodes lead many countries to establish extensive monitoring programs for the quality of waters, sediments and marine organisms for organic and inorganic contaminants. The elements of interest in this type of program are those with the highest toxicity such as: Hg, Pb, Cd, As, Ni, Cu, Zn and Sb. Besides inorganic compounds, organic contaminants are also of interest such as the polycyclic aromatic hydrocarbons (PAHs), because these compounds are persistent in the environment and are harmful to the biota of marine, coastal and estuarine waters.

Previous studies in the São Paulo State seashore indicated contamination and toxicity in water and sediment samples from the São Sebastião Channel and the Santos Estuary as well as bioaccumulation of contaminants in marine organisms<sup>2,3</sup>.

These regions are subjected to heavy anthropic impact since the 70's, mainly in Santos, due to large amounts of industrial discharges without proper control, which resulted in air, soil and water pollution. Despite contamination, fishing and capture of bivalve mollusks continued, leading to serious concern in relation to the consumption of these organisms by the local population<sup>4</sup>.

To assess the exposition to metals and PAHs in these regions, cultivated *Perna perna* (Linnaeus, 1758) mussels were transplanted from Cocanha Beach – Caraguatatuba City and used as control samples. The study sites were: Praia do Engenho d'Água – Ilhabela City, Terminal Almirante Barroso (Tebar) - São Sebastião City, Ilha das Palmas (Santos Bay) and Itaipu (Santos Bay). After a 3-month exposition period (June to August, 2005 – winter season), possible bioaccumulation of metals and PAHs was assessed in mussel tissues.

As, Ca, Co, Cr, Fe, Na, Se e Zn were determined in the transplanted mussel samples by instrumental neutron activation analysis (INAA); Cd and Pb were determined by eletrothermic atomic absorption spectrometry (ET AAS) and Hg was determined by cold vapor atomic absorption spectrometry (CV AAS)<sup>5</sup>. PAHs were determined by gas chromatography with mass spectrometric detection (GC-MS).

The results show that there was no significant contaminant bioaccumulation in the control site (Cocanha) after the transplant. However, As and Se levels were higher than the maximum tolerance levels according to the Brazilian legislation<sup>6,7</sup>. Engenho d'Água site presented the highest levels of Hg and Cd; Tebar site presented the highest levels of PAHs

(methyl-naphthalene, biphenyl, phenanthrene, fluoranthene, pyrene, crysene, benzo[b]fluoranthene, benzo[k]fluoranthene and benzo[e]pyrene); while mussels transplanted to Santos Bay (Palmas and Itaipu sites) presented the highest levels of Cr, Fe, Co and Pb. There was no significant correlation among metal and PAHs concentrations, indicating the possibility of different contamination sources in the studied sites.

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## Acknowledgments

The authors acknowledge CNPq, FAPESP, CAPES and the IAEA for financial support.