EVALUATION OF THE SHELL OF THE BIVALVE MOLLUSK *PERNA PERNA* AS A POTENTIAL BIOINDICATOR OF SETTLEABLE ATMOSPHERIC PARTICULATE MATTER

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INTRODUCTION: Metallurgical industries are among the main sources of particulate matter (PM) emissions into the atmosphere. This residue is considered an relevant environmental contaminant due to its metallic composition. In Vitória, Espírito Santo (ES), Brazil, air, soil, and water contamination resulting from PM deposition originates from the Tubarão Industrial Complex and can impact the local biota. **OBJECTIVE:** This study aimed to evaluate the incorporation of metals from settleable particulate matter (SePM) in the shell of the mussel *P. perna* after exposure to different SePM concentrations. **MATERIALS AND METHODS:** SePM samples were collected from Ilha do Boi, Vitória (ES), and *P. perna* specimens were collected from pristine areas at Cocanha Beach, Caraguatatuba (SP). *P. perna* individuals (n=360) were acclimated in the laboratory and subsequently exposed for 30 days to different SePM concentrations (0, 0.01, 0.1, and 1.0 $g \cdot L^{-1}$), followed by a 30-day depuration phase in clean water (without SePM). For chemical analysis of the shells, acid digestion was performed, and metal concentrations were determined using inductively coupled plasma mass spectrometry (ICP-MS). Data were analyzed using factorial ANOVA with R Studio software version 4.4.2. For ultrastructural shell analysis, scanning electron microscopy (SEM) equipped with an electron backscatter diffraction (EBSD) detector, a low-field detector (LFD), and an energy-dispersive X-ray spectroscopy (EDS) system was used to identify metallic particles. **RESULTS AND CONCLUSION:** Emerging metals such as V, Cr, and Cu were identified in the mussel shells, while Zn was detected and As, Cd, Hg, and Pb were below detection limits. SEM analysis confirmed the incorporation of metallic particles containing Al, Ti, Mn, and Ni within the shell layers. The data suggest that mussels can accumulate metals in their shells with minimal structural loss. Moreover, the presence of metallic particles both in SePM and within the shell indicates that the shell of *P. perna* can be used as a bioindicator of environmental contamination by metals and metallic nanoparticles.

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