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## Preliminary Study by Environmental Indicator Measurements of Sediments in a Mangrove Forest in Ilha Grande Bay, Rio de Janeiro, Southeastern Brazil

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### ABSTRACT

Mangroves perform essential functions in biological cycles and are protected by law in Brazil. However, they are being degraded above their support limit, leading to a reduction in the areas around the world. The area investigated in the present study is a potentially unpolluted mangrove ecosystem in the south of Rio de Janeiro state, Brazil. The aim of this work was to investigate the presence of metals and polycyclic aromatic hydrocarbons (PAHs) in mangrove sediment and to correlate them with mutagenic and genotoxic activity. Four seasonal samplings undertaken between 2009 and 2010 at five sites were analyzed. Dichloromethane extracts were obtained under sonication and subjected to mutagenicity assays using *Salmonella* micro-suspension. Metal (Cd, Cr, Cu, Ni and Pb) contents were determined by atomic absorption spectrometry, while the quantification of PAHs was performed by gas chromatography-mass spectrometry. *Goniopsis cruentata* hemocytes were used to assess potential genotoxic damage (Micronucleus assay). The absence of mutagenicity was observed for all samples using *Salmonella typhimurium* strains TA97, TA98, TA100 and TA102, in the absence and presence of an exogenous mammalian metabolizing system. Among the metals, Cd and Cu were detected in autumn at values exceeding the threshold effect level and below the probable effect level. Benzo[a] pyrene was detected at levels above the threshold at one site, where small effects could be observed in the biota. Significant differences in the micronucleated cells observed suggest DNA damage had been induced by the PAHs identified.

### KEYWORDS

Sediments; Mutagenicity; *Goniopsis cruentata*; Genotoxicity; Polycyclic Aromatic Hydrocarbons (PAHs); Metals

### Cite this paper

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