Linnaeus ECO-TECH 2020
Kalmar, Sweden, November 23-25, 2020

ECOLOGICAL RISK ASSESSMENT IN SEDIMENTS FROM THE URBANIZED LAGOON OF THE OLYMPIC PARK

Isabela Yasmin das Chagas Rodrigues
Júlia das Chagas Campos
Rafael Muniz Cavalcante
Amanda Carvalho Coutinho
Alena Torres Netto
André Luís de Sá Salomão

Dep. Sanitary and Environ. Engineering, Rio de Janeiro State University, Brazil

Abstract
The Jacarepaguá Lagoon (JPAL) is part of a lagoon complex, formed by others three lagoons, located in the west zone of Rio de Janeiro city, and has largest drainage area of the complex (103 Km^2). JPAL constantly receives the clandestine release of domestic and industrial effluents, in addition to diffuse contributions from drainage waters from different sources, with a high pollution load. Ecological Risk Assessment (ERA) is an important tool with a more global view of the risks for the management of contaminated areas, including the identification of adverse effects of contaminants on the environment. This study aimed to develop an ERA for the JPAL, using two lines of evidence (LoE): Ecotoxicological LoE and Ecological LoE. The sediments samples were collected in four sampling points (SP) in the JPAL. The Ecotoxicological LoE was based on chronic ecotoxicity assays (*Chlorella vulgaris* and *Ceriodaphnia dubia*) to estimate the Ecotoxicological Risk. The Ecological LoE was based on the analysis of the richness and abundance of local algae species to estimate the Ecological Risk. The Environmental Risk was estimated by integrating the Risks of the two LoE. The Ecotoxicological Risk was 0.80±0.12, classified as very high (0.75-1.0). The highest Ecotoxicological Risk was estimated for the SP3, being 0.95. The Ecological Risk was 0.746±0.01, classified as high risk (0.50-0.75). The estimated Environmental Risk was 0.78±0.08, which was a very high risk. The highest Environmental Risk was estimated also for the SP3, being 0.88. In summary, JPAL had an advanced stage of contamination, with a high content of organic matter in the sediment, caused by irregular effluents released. JPAL's current environmental risk exposes the urgent need for more inspection actions to prevent the release of sewage before the total degradation of the local ecosystem.

Keywords: Coastal lagoon, Environmental risk, Algal diversity, Lines of evidence, Domestic effluents, Industrial effluents.

ISBN: 978-91-89081-03-1