

Analysis of Cytotoxicity and Morphological Effect of Tributyltin (Tbt) Using Brine Shrimps**Fathima, A.T.¹, Bandara, K.R.V.², Manage, P.M.^{1*}**¹*Centre for Water Quality and Algae Research, Department of Zoology,
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University of Sri Jayewardenepura, Nugegoda, Sri Lanka***pathmalal@sjp.ac.lk***Abstract**

As an antifouling agent, Tributyltin (TBT) is widely employed in industrial applications. Still, it has been implicated in toxic effects on aquatic life, raising imbalance in the ecosystem, biodiversity loss, and bioaccumulation. Numerous research studies have recently been conducted to analyze the toxicological impact of TBT on marine organisms. Moreover, these studies employed alternative biological assays. The Brine Shrimp Lethality Assay is the most suitable system for assessing the toxicity of compounds, as it provides a wide range of advantages, including availability, simplicity, and rapidness. This study aimed to determine the cytotoxicity and morphological effects of tributyltin (TBT), a persistent environmental organotin pollutant, on brine shrimp (*Artemia salina*). Nauplii of brine shrimps (n=15) were exposed to increasing concentrations of TBT (3.1 ng. L⁻¹, 6.25 ng. L⁻¹, 12.5 ng. L⁻¹, 25 ng. L⁻¹, 50 ng. L⁻¹, and 100 ng. L⁻¹) and the mortality rates, lethal concentration (LC₅₀) value, and morphological abnormalities were assessed over 24-hour exposure. Triplicate assessments were done for all concentrations. An LC₅₀ value of 54.50 ngL⁻¹ was determined and prominent morphological changes in total length, head width, and abdomen width. Other morphological deformities, including asymmetrical appendages, elongated bodies, shortened antennae, swollen limbs, malformations along the tail, and impaired motility, were observed. A significant correlation was observed between increasing concentrations of TBT and its impact on mortality rates and morphological alterations ($p \leq 0.05$). The findings highlight TBT as a highly toxic environmental pollutant with potent cytotoxic effects on brine shrimp. Therefore, there is a need for further analysis of the toxicity of TBT, its impact on ecological systems, and the utilization of brine shrimp *A. salina* as a model organism for cytotoxicity investigations.

Keywords: *Tributyltin, Toxicity testing, Morphological abnormality, Brine shrimp, LC₅₀*