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Imposex in the gastropod, *Thais clavigera* as a sensitive biomarker for tributyltin (TBT) pollution

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Imposex occurs when certain invertebrates are exposed to organotin antifouling paints, resulting in the formation of morphological traits such as the penis and vas deferens in female gastropod mollusks or the superimposition of male morphological features onto females. Imposex is a morphological biomarker that can be used to detect organotin contamination in marine habitats. Among the various butyltin compounds, TBT accumulates the most and is the most common cause of imposex. TBT-induced imposex may be responsible for a significant amount of the loss of certain coastal marine invertebrates. The gastropod, *Thais clavigera* was used for imposex studies considering its high TBT sensitivity. *T. clavigera* species were collected from both commercial and fishery harbors in Western and Southern coastal stretches (n=30). Imposex response in the populations was evaluated by using the Relative Percentage Penis Length Index (RPLI) and Vas Deferens Length Index (VDLI), and Imposex development was assessed by calculating the indices of imposex incidence or Frequency (I %) given as a percentage of imposex-affected females in the sample. Statistical analyses were done by using Anova, 2016. Results revealed that the highest imposex frequency and TBT concentration were detected in Colombo harbor (TBT= 303± 7.4 ng/L; I= 38%), where the highest TBT concentration was recorded in Sri Lanka. Dikkowita (97± 4.3 ng/L; I= 36%), Galle (110± 4.1 ng/L; I=8%), Mirissa (54± 3.6 ng/L; I= 5%) and Kirinda (2. 2± 0.3 ng/L; I= 2%) followed with varying TBT concentrations and I%. No imposex frequency was recorded in samples collected from Dewundara and Hambanthota harbors, showing the relationship between contamination levels of TBT and imposex development in mollusks. RPLI in *T. clavigera* was found from 14.63% to 24.77%. Further, it was found that the imposex severity was high in females of *T. clavigera* collected from the Colombo and Dikkowita harbors. A positive correlation between the frequency of imposex incidence and TBT concentrations found at different locations ($p < 0.05$ & $r^2 = 0.64$) suggests that imposex-affected females in the population of *T. clavigera* augment with increasing TBT concentrations in the marine environment. It could be concluded that TBT is a potential xenobiotic chemical that acts as an environmental hormone that adversely affects mollusks causing reproductive impairment and leading to imposex incidences.

Keywords: Biomarker, Imposex, *Thais clavigera*, Tributyltin (TBT), Xenobiotic

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