



CONTAMINATION STATUS OF TRIBUTYL TIN IN COMMERCIAL AND FISHERY HARBORS IN SRI LANKA

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Abstract

Tributyltin (TBT) is a xenobiotic which belongs to the group of organotins with trisubstituted. TBT has a broad range of biocide properties and is used as an active ingredient in antifouling paints. These paints are applied as a finish coat to the immersed section of boats and floating structures to prevent the fixation of aquatic organisms which can cause major interferences with maritime activities. However, TBT is an endocrine disruptor and causes shell deformations, developmental retardation and imposex in some selected aquatic invertebrates leading to reproductive failure and population decline in the environment. Thus, in the present study we aimed to find the contamination status of TBT in both commercial and fishing harbors where boat activities are high. Water samples were collected from Colombo, Galle, Hambanthota and Trincomalee commercial harbors and ten fishery harbors operating in Southern and Eastern coastal belt in Sri Lanka. Surface water samples were collected from three different GPS locations in each harbor. Collected water samples were subjected to Solid Phase Micro Extraction (SPME) and quantification was done in Gas Chromatography Mass Spectrometry (GCMS). The results showed that the highest TBT concentration recorded in Colombo port ($303 \pm 7.4 \text{ ng L}^{-1}$) wherein Galle and Trincomalee were $72 \pm 4.1 \text{ ng L}^{-1}$ and $50 \pm 3.7 \text{ ng L}^{-1}$ respectively. TBT was not detected in Hambanthota port. TBT concentration in fishery harbors at Beruwala, Ambalangoda, Hikkaduwa, Galle, Kudawella, Kirinda and Trincomalee were in the range from $25 \pm 4.2 \text{ ng L}^{-1}$ to $241 \pm 5 \text{ ng L}^{-1}$ wherein Mirissa, Dewundara and Hambanthota were less than the minimum detection limit (1 ng L^{-1}). Hence, it can be concluded that the number of boats and the amount of maritime activities are responsible factors for the TBT contamination. Further, the concentration of TBT in some coastal water samples exceeded the concentration, which causes severe adverse effects (1 ng L^{-1}).

Keywords: Tributyltin (TBT), organotin, imposex, Solid Phase Micro Extraction (SPME)