Monitoring Tributyltin (TBT) Contamination of Southern Coastal Waters in Sri Lanka

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Tributyltin (TBT) is an organotin compound belongs to the group of Persistent Organic Pollutants (POPs) and one of the active ingredient in antifouling paints used for boat hulls, docks, fish nets in order to prevent the growth of aquatic fouling organisms. The presence of TBT in the aquatic environment is extremely toxic to target and non-target organisms and it is responsible for severe sexual disorders like sex changes called imposex leading to sterile aquatic populations which lead to decline of animal diversity. According to WHO, the No Observed Effective Level (NOEL) of TBT is below 1 ngL^{-1}. However, there are no information has been recorded regarding the TBT contamination in water and its adverse effect on aquatic organisms in Sri Lanka. Therefore, the study aims to monitor the contamination status of TBT in southern coastal area in Sri Lanka. Coastal water samples were collected from river canals, fishing harbors and river mouth along the Southern Coastal area from Dehiwala to Mirissa. TBT was extracted by using a newly optimized Solid Phase Micro Extraction (SPME) method. Hydridization process was followed for quantification by using the Gas Chromatography-Mass Spectrometry (GC-MS) in parts per trillion level (ppt). Results showed that the highest TBT concentration in highly polluted Dehiwala ($3.4ngL^{-1}$) and Wellawatta canals ($3.4ngL^{-1}$). TBT concentrations in fishing harbors at Ambalangoda, Galle, Mirissa and Beruwala were range from 1.4 ngL^{-1} to $3.2ngL^{-1}$ where in Madu and Benthota river mouth were $0.8ngL^{-1}$ and $0.9ngL^{-1}$ respectively. The recovery of the TBT extraction method was 87±0.1% for the artificial sea water. Thus, the preliminary results of the study showed that high contamination of TBT may adversely effect on marine biodiversity.

Keywords: Tributyltin hydride, Imposex, Solid Phase Micro Extraction (SPME), Gas Chromatography- Mass Spectrometry (GC-MS).