

Potential tributyl-tin (TBT) biodegradation agent in contaminated sediment

ABSTRACT

This study was conducted in order to seek potential microorganisms which are able to biodegrade TBT in sediments. Sediment samples were obtained from three seagrass beds (Merambong, Tanjung Adang, and Tanjung Kupang) and a fishing pier (Jeti Pendas). Microorganisms that are resistant to TBT concentration of more than 4.2 M were isolated and identified based on gram staining methods. The total numbers of colonies isolated from Tanjung Kupang, Tanjung Adang and Merambong were five, six, and nil, respectively. The surface sediments of all seagrass beds comprised of sandy clay. The total number of colonies from the pier's sediments which were resistant to TBT at concentrations of 4.2 M, 8.4 M, and 12.6 M were 59, ten, and five respectively. A total of 26 colonies were selected for this study, including all of the colonies from Tanjung Kupang and Tanjung Adang, as well as colonies that were resistant to 8.4 M, and 12.6 M TBT from the pier's sediment. All of the colonies were found to be gram negative whilst 16 colonies were resistant to 33.6 M TBT or more. This study showed that the Merambong seagrass beds are more sensitive to TBT contamination as compared to other seagrass beds and that potential microbe capable of degrading TBT can be found in TBT-contaminated sediments. These microbes may have a great potential in the bioremediation of TBT contamination if their degradation ability is confirmed and assayed in a detailed study.

Keyword: Tributyl-tin (TBT); Sediment; Straits of Johor; Microorganism; Resistant