

Booster biocides levels in the major blood cockle (*Tegillarca granosa* L., 1758) cultivation areas along the coastal area of Peninsular Malaysia

ABSTRACT

Booster biocides have been rapidly growing in use, mainly in the shipping industry and in agricultural activities. The use of booster biocides is known to cause adverse effects on marine ecosystems, such as by inhibiting the photosynthesis process in marine plants, and they have the potential to accumulate in marine organisms. In the present study, booster biocides of Irgarol 1051, diuron, 3,4-dichloroaniline (3,4-DCA) and chlorothalonil were measured in the major blood cockle (*Tegillarca granosa*) cultivation areas along the west coast of Peninsular Malaysia. The highest Irgarol 1051 mean was found in the blood cockle with a value of 98.92 ± 13.65 $\mu\text{g}/\text{kg}$ in Kapar, Selangor, while the means of diuron and its metabolites and 3,4-DCA showed the highest values of 40.31 ± 7.61 and 41.42 ± 21.58 $\mu\text{g}/\text{kg}$ in Kapar, Selangor and Sungai Ayam, Johor, respectively. Sungai Ayam, Johor also exhibited the highest amount of chlorothalonil of 29.76 ± 8.80 $\mu\text{g}/\text{kg}$. By referring to sediment quality guidelines, about 72% and more than 90% of sediment samples exceeded the environmental risk limits (ERLs) and maximum permissible concentration (MPC) for Irgarol 1051 and diuron, respectively. However, referring to the risk characterization ratio (RCR), none of the blood cockle samples exceeded 1, which means that there is no potential for adverse effects to occur. Thus, the contaminants in the marine ecosystem caused by booster biocides are highlighted as a serious issue, mainly in sediment.

Keyword: Booster biocides; Antifouling paint; Blood cockle; Sediment; Health risk assessment