A preliminary study on the use of gastropod-sediment accumulation factors (GSAFs) to identify gastropods as potential biomonitors of heavy metals contamination.

Abstract

This study presented the gastropod-sediment accumulation factor (GSAF) of four species of tropical gastropods from Peninsular Malaysia, which focused on the different parts of gastropods namely shell, digestive caecum, operculum and foot. It was found that the different parts of the gastropods could be classified into 1) macroconcentrator (GSAF > 2), 2) microconcentrator (1 < GSAF <2) and 3) deconcentrators (GSAF < 1), as proposed by Dallinger (1993). It was found that Chicoreous capucinus and Pomacea insularum were good macroconcentrators for Pb (in all parts namely shell, digestive caecum, operculum and foot). Thais sp. was found as a good macroconcentrator for Cu in all parts while Chi. capucinus was a good macroconcentrator for Cd and Cu based on shell, digestive caecum and foot and for Zn based on digestive caecum, operculum and foot. Similarly Cerithidea obtusa was found as a good macroconcentrator for Cd based on shell, digestive caecum and operculum. Therefore, the above results indicated that the metal accumulation rates and metal storage were tissue specific, and thus specific organ/tissues can be used for a better interpretative biomonitoring purpose. This preliminary study points to the use of GSAF values as potential indicators of metal bioavailabilities and contamination in coastal areas of Peninsular Malaysia and this should merit further studies.

Keyword: Gastropod-sediment accumulation factor; Metal distribution; Heavy metals contamination.