

Assessment of bioavailability and contamination by Cd in the tropical intertidal area, using different soft tissues of *Telescopium telescopium*: Statistical multivariate analyses.

Abstract

The mudflat snails *Telescopium telescopium* were collected from 18 geographical sampling sites in the intertidal area of Peninsular Malaysia. In this paper, the concentrations of Cd were determined in seven different soft tissues of the snails, namely foot, cephalic tentacles, mantle, muscle, gill, digestive caecum and remaining soft tissues. From this study, it was found that different concentrations of Cd were found in different soft tissues, indicating different mechanisms of sequestration and regulations of Cd in these different tissues. By comparing the Cd concentrations in the similar tissues, spatial variation of Cd was found in the different sampling sites although Kuala Juru always showed higher Cd levels based on the data of both snails and surface sediments. This is an indication of the polluted condition by Cd at Kuala Juru and localisation of Cd contamination in the intertidal area of Peninsular Malaysia. Digestive caecum was the main target organ for Cd storage and accumulation based on accumulation pattern of Cd in the seven soft tissues. The present study had revealed the importance of employing multivariate analyses in finding reliable relationships of Cd concentrations between the different soft tissues of *T. telescopium* and sediments. Cephalic tentacle and mantle were identified as good biomonitoring organs for Cd contamination in snails based on correlation analysis and multiple linear stepwise regression analysis, in which significant ($P < 0.05$) relationships were found between both tissues and sediments. Different bioaccumulation patterns of Cd were found in the different soft tissues of snails where tissue redistributions of Cd in cephalic tentacle and foot were good indicators of high Cd bioavailability of the sampling sites. This study may be the most comprehensive study on Cd tissue distribution in the different soft tissues of *T. telescopium* in relation to sediment in the tropical intertidal areas.

Keyword: *Telescopium telescopium*; Cd distribution; Different soft tissues.