

Use of different tissues of flat-tree oyster *Isognomon alatus* as biomonitors of bioavailabilities and contamination by Zn in the mangrove area of Peninsular Malaysia

Abstract

Oyster is a net accumulator of metals, especially Zn, which can be used as a biomonitor of time—integrated records of bioavailable Zn fractions over its life time. Total soft tissues of oysters have been frequently used in metal bio-monitoring study. However, a lot of environmental and biological effects could influence the metal data. In order to reduce such confounding factors, the use of different soft tissues in oysters is proposed in this study. The muscle, mantle plus gills, byssus and remaining soft tissues of flat-tree oyster *Isognomon alatus*, collected from the estuaries of Lukut (5 sites), Sepang Besar (2 sites) and one polluted site at Kg. Pasir Puteh, were analysed for Zn. Significant spatial differences in the accumulated Zn concentrations of the oysters (and hence bioavailabilities) were found between sampling sites and estuaries, and these could be attributed to anthropogenic inputs, including discharges of shrimp ponds (Lukut), animal husbandry (Sepang Besar), sewage, shipping and industrial effluents (Kg. Pasir Puteh). The use of different soft tissues of *I. alatus* as biomonitors of bioavailability and contamination by Zn in the mangrove area of Peninsular Malaysia is proposed. The erroneous results due to spawning and the problem of defaecation before dissection could be potentially reduced by using the oyster muscle. Hence, a more accurate interpretation of the bioavailability and contamination by heavy metals in coastal waters could be obtained. Overall, the present baseline data based on different soft tissues of the oysters can be used for regular biomonitoring, considering the rapid land-based development in the coastal area of Peninsular Malaysia.

Keyword: Biomonitoring; *Isognomon alatus*; Zn bioavailability; Mangrove area of Peninsular Malaysia