

Consumption of *Meretrix meretrix* (Linnaeus 1758) by selective shell size reduces heavy metal toxicity risk and overfishing in Tawau, North Borneo

ABSTRACT

Meretrix meretrix can accumulate heavy metals from the contaminated environment in its tissues and passed on these elements through the food chain, which can cause health hazards. The mean size distribution of the *M. meretrix* wild population at Batu Payung, Tawau, North Borneo, was determined by the linear morphometric analysis of outer shell length, and bivalve was categorized by the outer shell length size at 5-mm interval cluster groups. The selected heavy metals concentration in wild *M. meretrix* whole tissues was determined by an Induced Couple Plasma-Optical Emission Spectrometer (ICP-OES) to provide baseline data for policymakers and stakeholders to formulate sustainable harvest management. The largest group of outer shell size (45.00–50.00 mm) had the concentration of the least heavy metals in its tissues among other smaller shell size cluster groups, indicating *M. meretrix* outer shell length size of more than 45 mm cleanse excessive heavy metals out of their body more efficiently. A negative correlation between nonessential heavy metals (Cd, Pb) concentration in *M. meretrix* edible tissues and its outer shell length size signified that the largest group of outer shell size was safer to consume. *M. meretrix* is also facing overfishing like elsewhere in North Borneo.