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Proximate composition and heavy metal content in *Marcia opima* (Venus shell clam) in Kalpitiya Lagoon, Sri Lanka

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Abstract

*Marcia opima (*clam) is one of the highly abundant bivalve species found in Kalpitiya lagoon. Despite its abundance, this clam remains an underutilized food resource in Sri Lanka due to low consumer demand. This study was focused on analyzing the proximate composition and the heavy metal content of the *M. opima* in Kalpitiya Lagoon. Heavy metal content of the water and sediment samples were analyzed using the atomic absorption spectrophotometer. Clams (50 Calms/site) water and sediments were collected from two sites ie: Kandakuliya (KA) and Gangewadiya (GA). The moisture (80%), ash (1.3%), crude lipid (2.5%), crude protein (41%) in clams were not significantly different in KA and GA. The heavy metal concentrations in water were in the order of Pb>Cu>Cd at both sites. The Pb (0.24-0.19 mgL^{-1}), Cu (0.23-0.15 mgL^{-1}) concentrations in water were significantly higher in KA than that in GA but Cd (0.18-0.14 mgL^{-1}) concentration was significantly higher in GA compared to KA. The Pb, Cu, Cd concentrations in water at both sites exceeded the permissible level given by FAO. The Pb (11.0-10.0 $mgkg^{-1}$) and Cd (5.0-3.0 $mgkg^{-1}$) concentrations in sediment were not significantly different in both sites. The Cu concentration (6.0-4.0 $mgkg^{-1}$) in sediment was significantly higher in KA than that in GA. The Cd concentration in sediment exceeded the permissible level given by FAO. Cu (0.9-0.6 $mgkg^{-1}$) and Cd (0.8-0.5 $mgkg^{-1}$) concentrations in clams were significantly higher in KA compared to GA. The Pb (1.0-2.0 $mgkg^{-1}$) and Cd (0.8-0.5 $mgkg^{-1}$) concentration in clams in both sites exceeded the permissible level given by FAO. The pH (8.09±0.02), Conductivity (72.16±10.68 μScm^{-1}), Salinity (36.56±0.17 psu), total dissolved solid (24.67±5.46 ppt) were significantly higher in KA than in GA. The results indicated that clams were a highly nutritious food resource, though the concentrations of Cd and Pb exceeded the permissible level. Therefore, this raises concern about the potential health risk associated with their consumption and indicates the need of regular monitoring for food safety.

Keywords

Proximate composition, heavy metals, moisture, ash, crude lipid, crude protein