



Proximate composition and heavy metal content of *Crassostrea madrasensis* in Puttalam Lagoon, Sri Lanka

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Abstract

Oysters are a highly abundant shellfish group in Puttalam Lagoon, Sri Lanka. They are successful filter feeders that feed off nutrients in water. This study was conducted to analyze proximate composition and heavy metal content of *Crassostrea madrasensis* at two sites; Kandakuliya (KK) and Gangewadiya (GW) in Puttalam Lagoon, Sri Lanka. A total of 30 oysters were collected from both sites and morphometric parameters, and proximate composition of oyster flesh were analyzed. The presence of heavy metals (Pb, Cd and Cu) in flesh of oysters, lagoon water and sediments were also assessed. Results revealed that the length and weight (7.95 ± 0.42 cm, 457.97 ± 19.52 g) of oysters in KK were significantly higher than those (6.45 ± 0.52 cm, 199.35 ± 20.22 g) in GW. The moisture% of oyster flesh was significantly higher in GW (90.26%) compared to that of KK (80.36%). The crude protein (46.17%-46.22%), lipid (1.60%-1.67%), and ash contents (11.58%-11.64%) of oyster flesh were not significantly different among two sites. The pH, temperature, EC, salinity and TDS (8.10 ± 0.02 , 33.77 ± 0.82 °C, 72.16 ± 10.68 mScm⁻¹, 36.56 ± 0.17 PSU, 24.67 ± 5.46 ppm) of water in KK were significantly higher than those of water (7.88 ± 0.20 , 31.72 ± 0.64 °C, 49.35 ± 5.17 mScm⁻¹, 25.48 ± 0.91 PSU, 20.45 ± 0.16 ppm) in GW. The concentrations of Pb (0.0153 - 0.0157 mg g⁻¹) and Cd (0.0013 - 0.0015 mgg⁻¹) in oyster flesh were above the WHO/ FAO standard permissible limit in both sites. The Pb (0.1964 - 0.2436 mgL⁻¹), Cu (0.1520 - 0.2300 mgL⁻¹) and Cd (0.1477 - 0.1819 mgL⁻¹) concentrations in water samples from both sites were above the standards of CEA. The Cd concentration (0.0037 - 0.0055 mgg⁻¹) in sediments from two sites exceeded the WHO/ FAO lower permissible limit but Pb (0.0104 - 0.0114 mgg⁻¹) and Cu (0.0049 - 0.0064 mgg⁻¹) were below the permissible limit. Despite being a nutritious food source, oysters have Pb and Cd levels exceeding WHO/ FAO standards that may cause potential health risks.

Keywords

Oysters, heavy metals, proximate composition, Puttalam Lagoon