

Characterisation of cholinesterase activity from Asian swamp eel; *monopterus albus*, and testing its capabilities as a biosensor on metal ion contamination

ABSTRACT

The presence of high concentrations of heavy metals in the river impedes daily activities and damages the surrounding aquatic ecosystem. Continuous monitoring should be implemented to prevent continuous discharge resulting in increased levels of pollution over time. This study aims to determine the sensitivity of *Monopterus albus* muscle ChE to metal ions. Priorly, ChE was purified from *M. albus* muscle tissue using the ion exchange matrix, DEAE, with the yield percentage of 42.16% with the purification fold of 2.17. PTC was selected as a specific synthetic substrate with the highest concentration and lowest biomolecular constant at $145838 \pm 7533 \mu\text{M}\cdot\text{min}^{-1}\text{mg}^{-1}$ and 0.26 mM, while optimal assay parameters were obtained at pH 7.5 at 20 °C. Inhibition studies of metal ions involving Cr, Cd, Ag, As, Hg, Pb, Ni and Cu at the concentration of 10 mg/L. The activity of *M. albus* ChE was 56.61% inhibited by Hg²⁺ and the highest recorded compared to the other metals ion arranged in declining order; Cr < Cd = Ni < Cu < Pb < As < Ag. Overall, purified ChE from *M. albus* muscle has proven its ability to be applied as a biosensor that can be used for environmental monitoring programs.