

Characterisation of cholinesterase from kidney tissue of Asian seabass (*Lates calcarifer*) and its inhibition in presence of metal ions

ABSTRACT

Aim: The cholinesterase (ChE) based inhibition studies from fish were investigated and presented here emerged to be one of the great potential biomarkers for heavy metals monitoring. **Methodology:** In this study, the capability of ChE extracted from the kidney of *Lates calcarifer* was assessed for of metal. ChE was purified through ammonium sulphate precipitation and ion exchange chromatography. **Results:** The purified enzyme gave 12 fold purification with the recovery of 12.17% with specific activity of 2.889 U mg⁻¹. The Michaelis-Menten constant (K) and V_{max} value obtained was 0.1426 mM and 0.0217 μmol min⁻¹mg⁻¹, respectively. The enzyme has the ability to hydrolyse acetylthiocholine iodide (ATC) at a faster rate compared to other two synthetic substrates, propionylthiocholine iodide (PTC) and butyrylthiocholine iodide (BTC). ChE gave highest activity at 20- 30°C in Tris-HO buffer pH 8.0. The results showed that cholinesterase from *L. calcarifer* kidney was very sensitive to sensitive to copper and lead after being tested argentum, arsenic, cadmium, chromium, copper, cobalt, mercury, nickel, lead and zinc. **Interpretation:** The effect of heavy metals studied on the activity of ChE differed from each other. The result of the study can be used as a tool for further developing a biomarker for the detection of heavy metals in aquatic ecosystems. In addition, the information can also be used for designing a kit, that would give a rapid and accurate result.

Keyword: Biomarker; Cholinesterase; Metal ions; *Lates calcarifer*