

Assessment of acetylcholinesterase from *Channa micropeltes* as a source of enzyme for insecticides detection

Abstract

In this work we assess the potential of acetylcholinesterase (AChE) from *Channa micropeltes* (Toman) as a sensitive test for the presence of insecticides. The partial purification and characterization of a soluble AChE from *C. micropeltes* brain tissues using affinity chromatography gel (procainamide–Sephacryl S-1000) showed that the partially purified AChE was most active on acetylthiocholine (ATC) but had low activities on propionylthiocholine (PTC) and butyrylthiocholine (BTC), indicating that the partially purified fraction was predominantly AChE. Soluble AChE was partially purified 9.27-fold with a 91.12% yield. The partially purified AChE displayed the highest activity on ATC at pH 7 and at 30°C using 0.1 M Tris buffer. The enzyme exhibited Michaelis-Menten kinetic constants, K_m , for ATC, BTC and PTC at 36, 77 and 250 μM , respectively, and the maximum velocities, V_{max} , were 18.75, 0.12 and 0.05 $\mu\text{mol}/\text{min}/\text{mg}$ protein, respectively. Moreover, the AChE from *C. micropeltes* presented comparable sensitivity to carbamates and organophosphates insecticides than that from *Electrophorus electricus* by comparing half maximal inhibitory concentration values, therefore the enzyme is a valuable source for insecticides detection in Malaysian waters at lower cost.

Keyword: AChE; *Channa micropeltes*; Affinity chromatography; Biomarker