

PROPERTIES OF THIAMINASE IN FRESHWATER PRAWN

MACHROBRACHIUM ROSENBERGII

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ABSTRACT

Thiaminase (EC 2.5.1.2) catalyzes the displacement of the thiazole moiety of thiamine (vitamin B1) by a wide variety of nucleophiles. The presence of thiaminase in the diet has been associated with the occurrence of thiamine deficiency symptoms among mammals, including humans and fish. Here, we reported the properties of thiaminase in the hepatopancreas of fresh water prawn (*Machrobrachium rosenbergii*) from Asejire Lake in Southwestern Nigeria. The enzyme was partially purified with ammonium sulphate precipitation and affinity chromatography. The specific activity of the thiaminase was 0.2 $\mu\text{mol}/\text{min}/\text{mg}$ of protein. The Michealis-Menton (K_m) constant was 0.5 mM as compared to 1 mM of aniline. The optimum pH was 5.0, while the optimum temperature was 50⁰C. Reduced glutathione (GSH), 2 – mercapto ethanol (MCPE), Ethylene diamine tetra acetic acid (EDTA) and ascorbate significantly inhibited the enzyme but citrate showed activation of the enzyme activity at 97%. The amino acids: serine, lysine, valine, cysteine, proline, and aspartate also showed significant inhibition. The cations: Ca²⁺, Mg²⁺ Mn²⁺ and Sn⁺ showed complete inhibition on the enzyme. Hg²⁺, showed a slight inhibition on the enzyme. The thiaminase activity was significantly enhanced by Ni²⁺ while Zn²⁺ had no activity on the enzyme.

KEYWORDS: Thiaminase, Fresh Water Prawn, Hepatopancreas, Physicochemical, Properties