



PRELIMINARY STUDIES ON EXTRACTION OF UREASE ENZYME FROM SELECTED, SRI LANKAN VARIETIES OF *Cucurbita* sp. PUMPKIN SEEDS

Kolamunna K.C., Godakumbura P.I.* and Prashantha M.A.B.

Department of Chemistry, Faculty of Applied Sciences,
University of Sri Jayewardenepura, Sri Lanka
pahanig@sjp.ac.lk

Abstract

Urease is one of the highly efficient metalloenzyme that catalyzes the hydrolysis of urea into ammonium and carbonate ions. This study was aimed to extract urease from Sri Lankan pumpkin seeds (*Cucurbita* sp.). The significance of extracting urease from different varieties of same pumpkin species is to determine the highest efficient urease variety compared to commercial urease. The enzyme was extracted and then purified using ammonium sulphate precipitation and dialysis. Three varieties of pumpkin seeds (Padma, Dubai and Malbaro) found in Sri Lanka were compared with each other using urease activity and kinetics constants (K_m and V_{max}). Colorimetric analysis from indophenol method was used to determine kinetic constants. Maximum urease activity was achieved at the optimum conditions of 40° C and pH 7.4 after 40 min of incubation. The apparent K_m values for Padma, Dubai and Malbaro pumpkin urease enzymes were estimated by Lineweaver-Burk plot and found to be 22.89 mM, 20.89 mM and 42.28 mM respectively, when the maximum reaction rate (V_{max}) of urease were at 1.409, 1.360 and 1.974 mM min⁻¹. Obtained results of enzyme from Padma and Dubai were better compared to the Jack bean urease in which the K_m was 23.903 mM and V_{max} was 1.416 mM min⁻¹. The literature reported K_m value for Jack bean urease is 29.40 mM and it was higher than the reported value in this study. The effects of pH, concentration of substrate and storage period on urease activity were examined. Out of all the varieties, only Padma urease elicited substrate inhibition at higher concentration of urea. As an application, this kinetic study of enzyme can be used for the analysis of urea content in urine samples using indophenol method.

Keywords: Urease, *Cucurbita* sp., Pumpkin Seeds, Kinetics Constants, Indophenol Method