Application of Papain from Paw Paw (Carica papaya) latex in the Hydrolysis of Tiger Nut (C.esculentus) Proteins

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Abstract

Enzymatic hydrolysis of tiger nut protein homogenate offers many advantages as compared to the use of strong chemical reagents such as O-phthaldialdehyde (OPA) which destroys some amino acids present. Papain was purified to 6.82 purification folds with an activity yield of 531U/min by three steps purification processes of ammonium sulphate precipitation, followed by gel filtration on sephadex G50 and G200. The pH and optimum temperature of the enzyme was determined and found to be pH 7.5 and 90ºC respectively. The enzyme activity of crude enzyme and purified enzyme was 179U/min and 531U/min with Vmax and Km values of 1.133µmole/min and 0.487µg/ml respectively. Tiger nut protein homogenate was hydrolysed using the papain obtained from C. papaya latex and compared with that hydrolysed by O-phthaldialdehyde (OPA) after 10mins incubation. Equally, it was observed from the result of this study that papain hydrolysed the protein more than O-phthaldialdehyde (OPA). Hence, the optimum incubation time of 10mins was obtained at 37oC and pH 7.5 for all concentrations analysed. This protein hydrolysate could be used in preparing feeds for both livestock and human consumption.

Keyword: Papain, C. papaya, Hydrolysis, Tigernut, protein homogenate