

Određivanje proteolitičke aktivnosti i efekta bromelaina na fibrin, kolagen, hemoglobin i albumin

APSTRAKT. Bromelain je proteolitički enzim iz familije cistein-proteaza koja se nalazi u svežem ananasu. Ovaj enzim je čest sastojak antiinflamatornih preparata kao i različitih komercijalnih preparata za smanjenje telesne težine i pojačanje imunog sistema. Cilj ovog rada je ispitivanje proteolitičkog dejstva bromelaina na glavni protein koaguluma – fibrin, dva najčešća proteina krvi – hemoglobin i albumin, i kolagen – protein iz matriksa vezivnih tkiva.

Efekat bromelaina je određivan na nekoiko načina, u zavisnosti od vrste ispitivanog proteina.

Efekat na fibrin i kolagen je utvrđen vizuelno – praćenjem promena na fibrinskom vlaknu i gelu kolagena mikroskopski. Uticaj na hemoglobin i albumin je praćen merenjem koncentracije slobodnih aminokiselina i malih peptida u rastvoru iznad proteina denaturisanih trihlor sirćetnom kiselinom nakon dejstva bromelanina.

Proteolitička aktivnost bromelaina je potvrđena za sva četiri proteina pri čemu su najveće promene opažene kod fibrina i kolagena. Ovaj rezultat odgovara očekivanjima jer su fibrin i kolagen fibrozni proteini, koji su kao takvi podložniji dejstvu proteaza.

Determination of Proteolytic Activity of Bromelain and Its Effect on Fibrin, Collagen, Hemoglobin and Albumin

SUMMARY. Bromelaine is a proteolytic enzyme from pineapple that belongs to the cysteine-proteases class of enzymes. This enzyme is a common ingredient of anti-inflammatory preparations, as well of various commercial preparations used for weight reduction or immunity boost. The goal of this research was to investigate the proteolytic effect of bromelain on fibrin, two most common blood proteins – hemoglobin and albumin and collagen – the protein from the connective tissue matrix.

The effect of bromelain was estimated in several ways, depending on the protein in question. Effect of bromelain on fibrin and collagene were established visually, by observing changes on the fibrin fibre and collagen gell microscopically. Effects on hemoglobin and albumin were determined spectrophotometrically by measuring the concentration of amino acid residues in the supernatant over proteins denatured by trichloroacetic acid after 5 minutes of bromelain activity. The proteolytic effect of bromelain on the examined proteins was confirmed in all 4 proteins, with the greatest changes observed in fibrin and collagen. This is expected since these two are fibrous proteins, and thereby more prone to protease action.