

Biological Regulation of Endogenous Enzymatic Activity of Rainbow Trout (*Oncorhynchus Mykiss*) with Protease Inhibitors Chickpea in Model Systems

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Abstract : Protease is the generic name of enzymes that hydrolyze proteins. These are classified in the subgroup EC3.4.11-99X of the classification enzymes. In food technology the proteolysis is used to modify functional and nutritional properties of food, and in some cases this proteolysis may cause food spoilage. In general, seafood and rainbow trout have accelerated decomposition process once it has done its capture, due to various factors such as the endogenous enzymatic activity that can result in loss of structure, shape and firmness, besides the release of amino acid precursors of biogenic amines. Some studies suggest the use of protease inhibitors from legume as biological regulators of proteolytic activity. The enzyme inhibitors are any substance that reduces the rate of a reaction catalyzed by an enzyme. The objective of this study was to evaluate the reduction of the proteolytic activity of enzymes in extracts of rainbow trout with protease inhibitors obtained from chickpea flour. Different proportions of rainbow trout enzyme extract (75%, 50% and 25%) and extract chickpea enzyme inhibitors were evaluated. Chickpea inhibitors were obtained by mixing 5 g of flour in 30 mL of pH 7.0 phosphate buffer. The sample was centrifuged at 8000 rpm for 10 min. The supernatant was stored at -15°C. Likewise, 20 g of rainbow trout were ground in 20 mL of phosphate buffer solution at pH 7.0 and the mixture was centrifuged at 5000 rpm for 20 min. The supernatant was used for the study. In each treatment was determined the specific enzymatic activity with the technique of Kunitz, using hemoglobin as substrate for the enzymes acid fraction and casein for basic enzymes. Also biuret protein was quantified for each treatment. The results showed for fraction of basic enzymes in the treatments evaluated, that were inhibition of endogenous enzymatic activity. Inhibition values compared to control were 51.05%, 56.59% and 59.29% when the proportions of endogenous enzymes extract rainbow trout were 75%, 50% and 25% and the remaining volume used was extract with inhibitors. Treatments with acid enzymes showed no reduction in enzyme activity. In conclusion chickpea flour reduced the endogenous enzymatic activity of rainbow trout, which may favor its application to increase the half-life of this food. The authors acknowledge the funding provided by the CONACYT for the project 131998.

Keywords : rainbow trout, enzyme inhibitors, proteolysis, enzyme activity

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