BOOK OF ABSTRACTS

5TH MEETING OF YOUNG RESEARCHERS OF UNIVERSITY OF PORTO

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Proteolytic activity of surplus yeast extracts

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The surplus yeast is the second largest brewing by-product and presents rich chemical composition. The most abundant classes of macromolecules in yeast cells are proteins and carbohydrates. It is also rich in vitamins and minerals. The total mineral content of yeast is approximately 5–10% of the cell dry weight. This fraction comprises a multitude of elements, specially potassium and phosphorus. Several compounds of industrial interest can be isolated from brewer's yeast biomass, such as β-glucan, enzymes, proteins, vitamins, amino acids, cytochromes, the purine components of DNA and RNA [1].

The goal of this work was to evaluate the proteolytic activity of surplus yeast extracts using standard casein assay and by RP-HPLC using a protein subtract very resistent to hydrolysis, such as elastin. Comparison with activity of commercial enzymes was also performed.

Six yeast extracts (a mixture of enzymes, peptides, nucleotides and other soluble components of yeast cells) were produced by the breaking down of yeast cells using a mecanic process. β-glucan from cell walls was separated after centrifugation. Two yeast extracts were obtained from first use of yeast (Gn0 and Hn0) and the other four were obtained from reused yeast surplus (Gn+1, Gn+2, Hn+1, Hn+2). Protein content of extracts was evaluated by Bradford method and its proteolytic activity was confirmed by casein assay (Fig. 1). Good correlation was obtained between protein content and enzymatic activity of extracts.

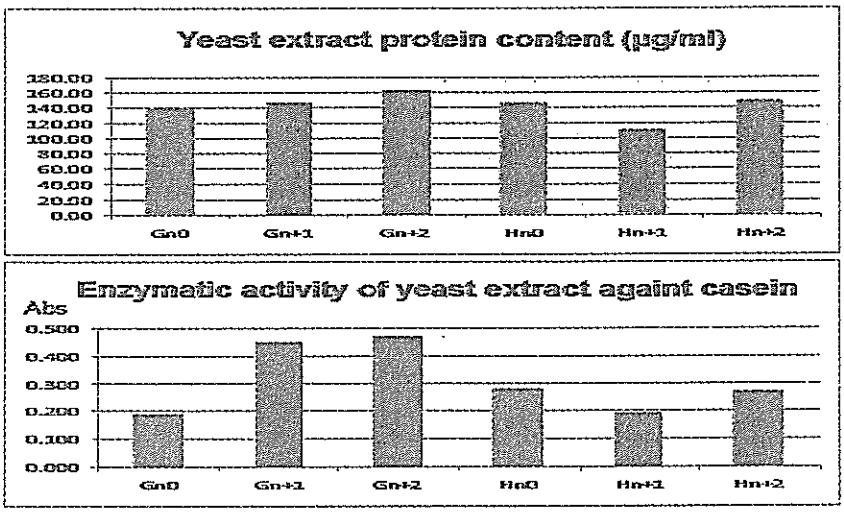

Fig. 1 - Protein content and proteolytic activity of yeast enzymatic extracts.

Hydrolysis of elastin and peptide formation was monitored by RP-HPLC/UV. Extensive peptide formation was observed after 24h incubation. Similar proteolysis was observed for commercial enzymes, namely alcalase.

[1] Ferreira, I.M.P.L.V.O., Pinho, O., Vieira, E., Tavarela J.G. (2010). *Brewer's Saccharomyces yeast biomass: characteristics and potential applications*. Trends Food Sci & Techn, 21, 77-84.