ANTIOXIDANT ACTIVITY OF *Mucuna pruriens* L. PROTEIN HYDROLYSATES.

Betancur-Ancona, D.; Herrera-Chalé, F.; Segura-Campos M.R.

Facultad de Ingeniería Química, Universidad Autónoma de Yucatán, Periférico Nte. Km. 33.5, Tablaje Catastral 13615, Col. Chuburná de Hidalgo Inn, 97203, Mérida, Yucatán, México. Teléfono: +529999460956; Fax: +529999460994. E-mail: maira.segura@uady.mx

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Introduction. Recently, there has been increasing interest in naturally occurring substances with antioxidative features. They are already used as natural antioxidants in the food industry, and there is increasing evidence that these substances retain their antioxidative effect within the human body. Some food-protein hydrolysates have been found to exhibit antioxidant activity. The utilization of protein hydrolysates to improve the antioxidant activity in foods presents additional advantages over other natural antioxidants, since they also confer nutritional value, as well as, desired functional properties.
The objective of the present study was to modify enzymatically protein concentrates of *M. pruriens* and to evaluate the antioxidant properties of the hydrolysates.

Methods. *M. pruriens* seeds were obtained from the February 2010 harvest in Yucatan state, Mexico. A single extraction was done with 6 kg *M. pruriens* seeds. Impurities and damaged seeds were removed and sound seeds were milled in a Mykros impact mill until passing through a 20-mesh screen (0.85 mm), and then in a Cyclotec 1093 (Tecator, Sweden) mill until passing through a 60-mesh screen (0.24 mm). The resulting flour was processed using the wet fractionation method of Betancur-Ancona et al. (1). Hydrolysis of the protein extract was done using a totally randomized design, with the treatments being the enzymatic system applied: Alcalase-Flavourzyme and Pepsin-Pancreatin sequential systems. The response variable was degree of hydrolysis which was calculated by determining free amino groups with o-phthaldialdehyde following Nielsen et al. (2). *M. pruriens* hydrolysates were fractionated by ultrafiltration (UF) according to Cho et al. (3). The hydrolysates and their corresponding ultrafiltered peptide fractions were analyzed to determine their antioxidant activity.

Results. Alcalase-Flavourzyme and pepsin–pancreatin were used to produce extensively hydrolyzed *M. pruriens* protein extract. DH differed between the enzymatic systems with percentages of 20.23 and 40.15%, respectively. Fractionation increased *in vitro* biological activity in the peptide fractions, with TEAC (Trolox equivalent antioxidant coefficient) value ranges of 29.95-162.86 (AFH) (Fig. 1) and 10.12-709.81 (PPH) mM/mg protein (Fig.2). Although further research is needed on purification steps and peptide sequences, hydrolysates from *M. pruriens* are promising natural antioxidants and potential ingredients in functional food systems.

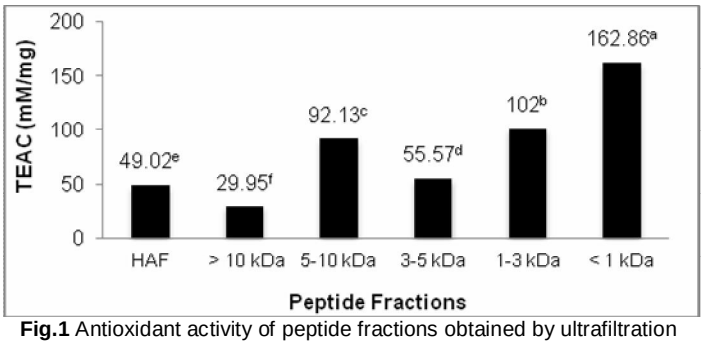

Fig.1 Antioxidant activity of peptide fractions obtained by ultrafiltration from Alcalase-Flavourzyme protein hydrolysates. Different superscript letters indicate statistical difference (P < 0.05).

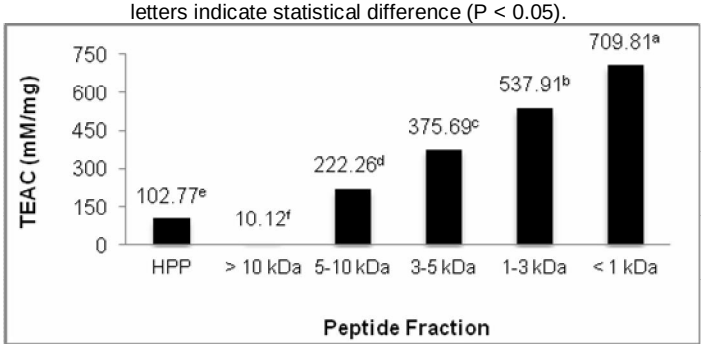

Fig.2 Antioxidant activity of peptide fractions obtained by ultrafiltration from Pepsin-Pancreatin protein hydrolysates. Different superscript letters indicate statistical difference (P < 0.05).

Conclusions. The results indicate the possibility of obtaining bioactive peptides from *M. pruriens* proteins by means of a controlled protein hydrolysis using AF and PP. The *M. pruriens* protein hydrolysates and their corresponding ultrafiltered peptide fractions might be utilized for physiologically functional foods with antioxidant activity.

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References.

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