

Potential Use of *Cnidoscolus Chayamansa* Leaf from Mexico as High-Quality Protein Source

Authors : Diana Karina Baigts Allende, Mariana Gonzalez Diaz, Luis Antonio Chel Guerrero, Mukthar Sandoval Peraza

Abstract : Poverty and food insecurity are still incident problems in the developing countries, where population's diet is based on cereals which are lack in protein content. Nevertheless, during last years the use of native plants has been studied as an alternative source of protein in order to improve the nutritional intake. Chaya crop also called Spinach tree, is a prehispanic plant native from Central America and South of Mexico (Mayan culture), which has been especially valued due to its high nutritional content particularly protein and some medicinal properties. The aim of this work was to study the effect of protein isolation processing from Chaya leaf harvest in Yucatan, Mexico on its structure quality in order: i) to valorize the Chaya crop and ii) to produce low-cost and high-quality protein. Chaya leaf was extruded, clarified and recovered using: a) acid precipitation by decreasing the pH value until reach the isoelectric point (3.5) and b) thermal coagulation, by heating the protein solution at 80 °C during 30 min. Solubilized protein was re-dissolved in water and spray dried. The presence of Fraction I protein, known as RuBisCO (Rubilose-1,5-biphosfate carboxylase/oxygenase) was confirmed by gel electrophoresis (SDS-PAGE) where molecular weight bands of 55 KDa and 12 KDa were observed. The infrared spectrum showed changes in protein structure due to the isolation method. The use of high temperatures (thermal coagulation) highly decreased protein solubility in comparison to isoelectric precipitated protein, the nutritional properties according to amino acid profile was also disturbed, showing minor amounts of overall essential amino acids from 435.9 to 367.8 mg/g. Chaya protein isolate obtained by acid precipitation showed higher protein quality according to essential amino acid score compared to FAO recommendations, which could represent an important sustainable source of protein for human consumption.

Keywords : chaya leaf, nutritional properties, protein isolate, protein structure

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