XIV Congreso Nacional de Biotecnología y Bioingeniería

OPTIMIZATION OF ENZYMATIC LIQUEFACTION OF JICAMA (*PACHYRHIZUS EROSUS*) BY PECTINEX ULTRA SP L

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Key words: Pectinex, yam bean, enzymatic pulping

Introduction. Jicama is a tropical legume used for its starchy tuber that is crisp like an apple and succulent, with a light sweet pleasant flavor (Juarez et al*.,* 1994). However, it is underutilized as it is only consumed as a raw vegetable with lemon and chili, in soups or salads, stir fried, conserved in vinegar with onion and chili or as a substitute for the water chestnut (Aquino-Bolaños et al., 2000). Liquefied jicama can be a source of food products (beverages) and ingredients (polysaccharides, oligosaccharides or monosaccharides). The very low amount of lectin and other anti-nutrient factors reported by Noman et al. (2007) showed no threat by anti-nutrients against bioavailability of nutrients in the tuber. From the industrial viewpoint, it is necessary to improve the yield of juice produced (Mélo *et al*., 2003).

Enzymatic jicama liquefaction process has been optimized to recover the highest yield (volume) and weight loss. Responses such as pH, °Brix, weight loss, alcohol insoluble solids (AIS), volume and weight loss were studied.

Materials and methods. Jicama (*Pachyrhizus erosus* L.) tissue was treated with a commercial enzyme preparation (Pectinex Ultra SP L). Optimization of liquefaction and saccharification of jicama root was done using Response Surface Methodology with a 2 factor (incubation time and enzyme ratio), 5 level central composite rotatable design with 5 experiments at central point and 39 total experiments. The independent variables were the incubation time (X_1) and the Pectinex Ultra ratio (X_2). The response functions were pH (Y_1), total soluble solids (Y_2), weight loss (Y_3), AIS (Y_4) and volume (Y_5).

Results. At the optimum conditions for liquefaction and saccharification (incubation time and enzyme ratio of 10.00 h and 2.40 (v/w), respectively), the pH was 4.24, the total soluble solids (TSS) amount was 9.00 °Brix, weight loss percentage was 95.82%, AIS yield was 0.12% and the volume obtained was 98.00 mL.

Conclusion. Optimal conditions of liquefaction and saccharification of jicama tissue have been found to obtain the highest weight loss and volume. The products obtained have uses in a wide variety of applications in food processing.

Acknowledgements. A.M. Ramos-de-la-Peña received the scholarship for his graduate degree from CONACYT.

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