

Oil Recovery from Enzymatically-treated Goldenberry (*Physalis peruviana* L.) Pomace: Range of Operational Variables

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Goldenberry (*Physalis peruviana* L.) is one of the most promising fruits and many interesting functional products anticipated to be developed from it. The pomace (seeds and skins) represent a large portion of the waste generated during juice processing (ca. 27.4% of fruit weight). The potential of goldenberry agro-industrial wastes for use as substrate for production of edible oil was evaluated. The *n*-hexane-extractable oil content of the raw by-products was estimated to be 19.3%. Aqueous enzymatic extraction was investigated for recovery of oil from the fruit pomace. The most significant factors affecting extraction were enzyme concentration, the time of digestion with enzymes, substrate concentration in water and the particle size of substrate. A broad variation in extracted oil was obtained depending on the operational conditions during the enzyme-aided aqueous extraction. The optimum and economical values were those obtained for 4: 0.02: 1 water: enzyme: substrate ratio. Generally, enzymatic treatment increased the extraction yield. The more than 42% yield by enzymation compared to the nearly 3% yield in the control process (without enzyme) implies a significant relative increase in yield by about 92.8%. Although proteases slightly improve yield, the enhancement values are much lower than those obtained with Cellulase EC and Pektinase L40. Rapid increase in yield occurred as the enzyme concentration increased from 1 to 2 g /100 g substrate. Yield increased with dilution, but it began to fall when the substrate became more diluted. Moreover, extractability increased significantly when particle size reduced.

Literature:

1- Ramadan, M. F., and Moersel, J.-T. (2007) J. Sci. Food Agric. 87:452-460.

2- Ramadan, M. F., and Moersel, J.-T. (2007) Int. J. Food Sci. Technol. in press.