



210/B

Studies on modified methods for pectin precipitation in commercial production of pectin from yellow passion fruit peel (*Passiflora Indica*)

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Pectin is a high value functional food ingredient that is widely used as a gelling agent and a stabilizer in food, beverage, pharmaceutical and biotechnology industry. Most commonly used sources of pectin are from apple pomace and citrus peel. New sources of pectin are of importance to meet the increasing demand. Extraction of pectin from passion fruit peel could offer economic advantages and create a positive environmental impact to the local food industry. This study investigates on some chemical and physical characteristics of pectin extracted from yellow passion fruit endocarp (*Passiflora Indica*) and on economical methods to precipitate pectin from the extracts.

Pectin was extracted from passion fruit endocarp, from fresh and dried powder (40 °C for 24 h), with 1 M HCl (pH 1.34) at 65 °C for 2 h, and filtered. Pectin was precipitated from the filtrate using three different concentrations/solvents; such as ethyl alcohol (absolute), ethyl alcohol (96 %, commercial food grade) and isopropyl alcohol, was left to precipitate for 16 h and the effect on yield was quantified. Changes in the quality parameters; such as Degree of esterification (DE), Methoxyl content, Acetyl value, Galacturonic acid content, Equivalent weight (EW), Gel grade and setting time were quantified.

The yield of pectin from fresh, concentrated and dried and milled fruit endocarp was

14.03 ± 0.06 , 17.5 ± 0.42 and 32 ± 2 % (on dry basis), respectively. These values are higher than reported values from other sources like apple pomace and citrus peel. Although a higher yield of pectin was obtained by precipitation with absolute ethyl alcohol (32.33 ± 0.58 %), the use of commercial grade ethyl alcohol (28.33 ± 0.58 %), was found to be more economical. The DE (%) ($72.56 \pm 1.36 > 68.73 \pm 0.47$) and Methoxyl content ($9.78 \pm 0.14 > 7.9 \pm 0.40$) of passion fruit pectin was higher than pectin purchased from commercial sources. Results suggest that, passion fruit pectin is a high methoxy pectin (>7%) for use in the food industry. The purity of pectin was high (84.87 ± 1.03 % galacturonic acid content) while the Acetyl value was < 1% , hence gel forming (0.81 ± 0.02). Both EW ($847.63 \pm 25.43 < 1307.23 \pm 20.94$) and gel grade ($140 < 150$) was lower than the commercial products, but showed similar setting time (<25 min) Passion fruit peel is a good source for the production of food grade pectins with a yield of approximately 30%. Commercial grade ethyl alcohol (96 %) is more economical as a precipitating agent for extraction of pectin from passion fruit peel.