

## **Preliminary Study on the Production of Essential Oil and Pectin from the Peel and Fruit Waste of Sour Orange (*Citrus aurantium*)**

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Sour Orange is one of the underutilized plants found in Sri Lanka and parts of this plant can be utilized for the production of value added products namely essential oils and pectin. The present study focuses on the development of processes needed for the extraction of value added products like essential oil from sour orange peel and pectin from waste collected after juice extraction. For essential oil production, initially sour orange peel produced 75 ml of essential oil / 100 g of peel when it was treated with solid (peel) to solvent (distilled water) ratio of 1:2 at 88 °C temperature for 60 minutes. After the optimization of conditions such as temperature (98 °C), time (60 min) and solid to solvent ratio (1:2), the production of essential oil was significantly increased by 1.47 times (110 ml essential oil / 100 g peel). Chemical properties such as acid value, peroxide value, saponification value and specific gravity of the extracted oil were determined and results of these values were 5.05 mg KOH/g oil, 10.00, 39.30 mg KOH/g oil and 0.99 g/cm<sup>3</sup> respectively. For pectin extraction 20 g of sour orange waste was dipped in different pH of citric acid solution (1.0, 1.5, 2.0, and 3.0) and heated at 80° for 1hour. Highest yield was obtained at pH level of 1.0 (1.13 g) and the yield was significantly reduced with increase of pH values. Then chemical properties such as methoxy content, degree of esterification and acetyl value of extracted pectin were determined. The methoxy content of pectin from sour orange waste was 5.95 %. Therefore it belongs to the low methoxy pectin. Generally low methoxy pectin (less than 7.0 %) can form gels with lower concentrations of sugars. The degree of esterification of this pectin is 62.50 % and it can be classified as slow set pectin (DE 58-65 %). Acetyl value of extracted pectin was 0.36 % and it is similar to acetyl value of commercial pectin (0.36 %). This is a preliminary study and further studies needed to confirm the results.

**Key words:** Essential oil, Fruit waste, Pectin, Peel, Sour orange