

**PREPARATION OF WATERMELON (*Citrullus lanatus*)
JAM USING PECTIN EXTRACTED FROM
LEMON (*Citrus limon* L.) PEELS**



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ABSTRACT

Pectin is widely used as a gelling agent, thickener, emulsifier and stabilizer in different food processing operations. But citrus fruits peels are very rich in pectin source and can be used as source for its production commercially. During processing citrus peels contribute almost 5-20% of total fruit. Therefore, huge amount of municipal solid wastes, which have been an increasingly tough environmental issue. Therefore, a research was conducted to make use of lemon peels, as a source of pectin and utilization in the watermelon jam formulations with different combinations of sugar and pectin and to assess the quality attributes during storage.

Pectin was extracted using ethanol precipitation method from peels of lemon after which the extracted pectin and commercial pectin were characterized using both qualitative and quantitative analysis. Considering the results of preliminary studies five formulation of watermelon jams were formulated by using different combinations of sugar and pectin in the weight ratio of (80:0, 75:1.8, 70:2.3, 65:2.8, 60:3.3). The freshly made watermelon jam formulations were subjected to physico-chemical, sensory analysis and microbial assessment. Analysis were done at 2 weeks interval through the storage period. Nutritional parameters of titratable acidity, pH, ascorbic acid content, total soluble solids, moisture and total sugar were analyzed for the watermelon jam formulations. Sensory attributes of colour, taste, texture, aroma and overall acceptability were evaluated by 20 semi – trained panelists using a seven point hedonic scale. The most preferred formulations (T₁, T₃, T₄, T₅) were selected for storage studies. The formulations were stored at room temperature $30\pm 1^{\circ}\text{C}$ and 70.75% RH for 12 weeks.

Considering the result in the quantitative test the pectin yield was found to be 20.3%, Methoxyl content of the extracted pectin was found to be < 7%, so the extracted lemon peel pectin is considered as low methoxyl pectin. The nutritional analysis of freshly made watermelon jam shown increasing trend in titratable acidity (from 0.27% to 0.61% as citric acid), moisture (from 52.9% to 63.1%) and decreasing trend in pH (from 3.95 to 3.31), total soluble solids (from 68.04 °Brix to 66.11 °Brix), total sugar (from 50.43 to 16.55%). The sensory assessment of freshly made watermelon jam revealed that there were significant ($p < 0.05$) differences among the sensory attributes according to Tukey's Test.

Nutritional analysis of the stored watermelon jam formulations revealed the increasing trend in total sugar, total soluble solids, titratable acidity, and moisture. And declining trend in pH, and ascorbic acid. The nutritional analysis showed that there were significant ($p < 0.05$) difference among the formulations. The sensory assessment revealed that there were significant ($p < 0.05$) difference among the sensory attributed following storage. Mean scores of all organoleptic characters were gradually decreased during 12 weeks of storage period. The highest overall acceptability was observed in formulation with 65g sugar and 2.8g pectin and the all formulations were microbiologically safe.

Based on the nutritional quality assessment, sensory analysis and microbiological studies, the watermelon jam with 65g sugar and 2.8g pectin, could be stored for 12 weeks without any significant changes and extend the shelf life, the lemon peel pectin is a good source of pectin, and subsequently, watermelon jam might be produced using extracted pectin lemon peel powder which as no deleterious effect on consumers.

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