

Abstract

Jackfruit is widely cultivated in tropical areas. The fruit is mainly grown and consumed fresh. Approximately 65% of jackfruit is inedible and this part is commonly fed to animals or discarded. However jackfruit waste can be processed into pectin for use in food processing. The characteristic of pectin vary between and within sources implying a deeper understanding of a pectin source is needed if its efficient utilization is to be achieved.

A survey was conducted in five selected districts of Uganda (Jinja, Kamuli, Kayunga, Luuka and Mityana) to establish the existing jackfruit types, production levels, maturity period and utilization. Jackfruit samples of varying flake color were picked. Fruit dimensions, fruit part proportions and flake physico-chemical properties were determined. Pectin was extracted from each of these parts and the physico-chemical properties of the pectin analyzed.

Results showed that jackfruit is widely grown in the study areas but on rudimentary scale mainly for house hold consumption and to a small extent, the flakes are dried into chips or fermented into jackfruit wine. The study areas were estimated to have about 1.7 million fruiting jackfruit trees yielding between 20-120 fruits per tree per season with an average weight of 11 kg per fruit. The annual production for Jinja, Kamuli, Mityana, Kayunga and Luuka districts was estimated at 0.403, 0.345, 0.309, 0.297 and 0.172 million tons, respectively. Yellow flaked fruit types had the biggest flake size followed by the white and orange flaked fruit types ($p < 0.05$). The period to maturity varied with flake type ($p < 0.05$) and ranged between 95 to 113 days. Jackfruit flakes contained 1.6-4.3mg/100g ascorbic acid, 0.3-2.4mg/100g carotenoids and total soluble solids 17-26 brix, with TSS: acid ratio of 44-65. Flake hardness was 12.1 ± 1.2 N/mm in white flakes 10.5 ± 1.0 N/mm in yellow flakes and 6.6 ± 0.7 N/mm in orange. The average equivalent weight (EQW) for yellow, orange and white flakes pectin was 917, 868 and 662g/mol respectively. The methoxyl content (MeO) for the majority of jackfruit pectins studied was above 7% the critical limit. Whereas, anhydrogalacturonic acid (AUA) content was below 65%. The degree of esterification (DE) for all pectin types was about 50%. Pectin from different jackfruit parts and types varied in gelling properties when tested at different Ca^{2+} levels with pectin from orange and white flaked jackfruit types gelling at 35 mg/100ml [Ca^{2+}] at room temperature. The results of this study, suggest that the study areas have a high potential for jackfruit production and pectin from jackfruit is of a good quality and therefore suitable for industrial application.