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Evaluation of Physicochemical and Sensory Properties of Indian Jujube (*Ziziphus Mauritiana L.*) Fruit Jam as Influenced by Different Sweeteners

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Background:
The main type of sugar used to make jams is granulated sugar, but its excessive consumption in fruit jam has been linked to several illnesses. Thus, it calls for a need to substitute it with other sweeteners. However, substituting sugar in the manufacturing of jams can result in modifications of their flavour, texture, and structure, which will decrease their commercial appeal. Besides, *Bidara* is an underutilized fruit with high nutritional and phytochemical values. Therefore, the goal was to determine the effect of different sweeteners on physicochemical and to evaluate the sensory acceptability of *Bidara* fruit jam.

Methods: Four *Bidara* fruit jam were prepared by incorporating sucrose, stevia, allulose and xylitol, respectively. Fruit jam was cooked until it reached the desired total soluble solids as a jam, at 65 °Brix. Physicochemical properties such as pH, viscosity, spreadability, moisture content, water activity (a_w), total titratable acidity and sugar analysis, of *Bidara* fruit jam were compared. Apart from that, sensory attributes of fruit jam such as appearance, aroma, taste, texture, spreadability and overall acceptability were evaluated to determine acceptability of these jams as compared to the one that is conventionally prepared using sucrose.

Results: The proximate composition found that *Bidara* fruit jam have 26.20-34.24% of moisture content, with a_w 0.7076-0.8748, pH 3.23-3.40, viscosity at 0.60-3.18 Pa.s, 4.91-5.76% of total titratable acidity, and 2.51-26.86% of reducing sugar. The spreadability analysis demonstrated that the parameters between fruit jam prepared with sucrose and stevia showed no significant differences ($p>0.05$) which suggests that they have similar textural properties. Despite no significant differences ($p>0.05$) were observed in all sensory attributes between the samples, score of sensory evaluation has revealed that *Bidara* fruit jam prepared using stevia received the highest score in overall acceptability.

Conclusion: This study revealed that different types of sweeteners have different effects on physicochemical properties of *Bidara* jam, due to their varied compositions and qualities. Furthermore, the browning response during jam processing can be influenced by the sweetener used, which might have an impact on the development of flavour and colour. Sensory evaluation showed that all *Bidara* jam are equally acceptable regardless the type of sweeteners incorporated.

Keywords: Fruit Jam, *Ziziphus mauritiana*, *Bidara*, Xylitol, Stevia

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