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Effect of Fermentation and Drying Techniques on Physiochemical Properties of Guava (*Psidium Guajava*) Leaf Infusion

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Structured Abstract

Background: The increasing demand for functional beverages has prompted the investigation into other botanical sources aside from the traditional Camellia sinensis tea. Guava (*Psidium guajava*) leaves continue to be underutilized despite their rich composition of bioactive compounds, such as polyphenols, tannins, flavonoids, and antioxidants. Large amounts of guava leaves go to waste during agricultural and postharvest processing, so it is highly necessary to optimize this valuable plant resource. Fermentation and drying are crucial processes that determine the physical and chemical nature of tea-based beverages. Thus, this investigation is carried out to determine the effects on fermentation time and drying processes on the physicochemical attributes and the sensorial attributes of the guava (*Psidium guajava*) leaf infusion.

Methods: Fresh guava leaves (*Psidium guajava*) were fractioned into particle sizes of <2 mm and >2 mm, then subjected to 14- and 21-day fermentation periods at two temperatures of 25°C and 35°C. The leaves were then dried by microwave and oven-drying techniques. The dried leaves were extracted for guava leaf infusions. The physical properties of the processed leaves, measured by moisture content, water activity, bulk density, tapped density, flowability, carr's index, hausner ratio, and specific gravity, were assessed. The chemical properties of the processed leaves, measured by antioxidant activity, total phenolic content, and total tannin content, were determined. Sensory evaluation was done by the 9-point hedonic scaling method for colour, aroma, taste, aftertaste, and general Acceptability of the infusions. Statistical analysis was done by four-way ANOVA.

Results: The findings of the study showed all factors significantly impacted all the physicochemical and sensory characteristics considered in guava (*Psidium guajava*) leaves infusion. Sensory evaluation demonstrated that infusions with acceptable colour, aroma, and taste characteristics, similar to black tea, could be obtained for selected conditions of fermentation and drying.

Conclusion: In conclusion, the potential use of guava (*Psidium guajava*) leaves as a material for a tea drink has proven viable. The methods used in this study could improve the quality, thus suggesting that guava (*Psidium guajava* leaves have potential uses as a value-added material in a functional drink, which would be used as an alternative tea drink apart from *Camellia sinensis*.

Keywords: Guava, *Psidium guajava*, fermentation, drying

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