Molecular Characterization and Comparative Evaluation of the Microbiological, Sensory Characterization of Spontaneously, Mono and Coculture Fermented Soursop Beverages

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Certification

This is to certify that **Olatunji Abiodun AYODELE**, with the matriculation number: **LCU/PG/003857**, carried out this research work titled **" Molecular Characterization and Comparative Evaluation of the Microbiological, Sensory Characterization of Spontaneously, Mono and Coculture Fermented Soursop Beverages"** in the Department of Biological Science, Faculty of Natural and Applied Science, Lead City University, Ibadan, Oyo State, for the award of Bachelor of Science Degree (M.Sc.) in Microbiology and that this has not been previously submitted.

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Dr Felicia C. Adesina **Date**
(Promoter)

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Dr Omonike Bakare **Date**
(Head of Department)

Dedication

This Thesis is dedicated to Almighty God, from whom all things flow.

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Abstract

Soursop is a nutrient-dense tropical fruit rich in bioactive compounds, with prebiotic characteristics yet its commercial potential is limited because of short shelf life and underutilization. This study aimed at developing fermented soursop beverage using selected starter cultures regarded as safe among microbes indigenous to the fruit in mono and mixed-cultures under controlled environmental condition in order to expand its usefulness to human. Microbial and nutritional value of spontaneously fermented soursop juice was done at 24-hour interval for 120 hours using standard methods. Among isolated microbes were *Kurtzmaniella quercitrusa* and *Leuconostoc mesenteroides* that met starter attributes and were used for fermentation of the extracted juice from fruit. Nutritional value of recovered beverages was compared with that of spontaneously fermented juice and sensory evaluation was conducted on starter fermented beverages using a 5-point hedonic scale to measure general acceptability. Peak microbial count was at 48 and 72 hours. Significant differences were observed on some parameters tested among recovered beverage and controls, specifically in crude proteins, vitamins, Zinc and Magnesium contents with co-cultured fermentation beverage having the best attributes and being more acceptable. All starter fermented beverages had considerably improved aroma, titratable acidity, lactic acid and ethanol contents also increased to acceptable level, so also mineral contents. Findings confirmed the effectiveness of mixed-culture fermentation in enhancing the nutritional stability, palatability, and functional quality of fermented foods. Resulting beverage shows potential as a probiotic-rich non-dairy beverage suitable for health-conscious consumers and those with lactose intolerance.

Word Count: 242

Keywords: Soursop, Starter, *Leuconostoc mesenteroides*, *Kurtzmaniella quercitrusa*, Functional beverage, Sensory evaluation.

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List of Acronyms

Abbreviation	Meaning
LAB	Lactic Acid Bacteria
FFs	Fermented Foods
LA	Lactic Acid
SCOBY	Symbiotic Community of Bacteria and Yeast Symbiotic community of Bacteria and Yeast
CNS	Coagulase Negative staphylococci
Abv	Alcoholic Strength by Volume
NA-FB	Non Alcoholic Beverages
LA-FB	Low Alcoholic Fermented Beverages
AFB	Alcoholic Fermented Beverages
HPH	High Pressure Homogenization
HHP	High Hydrostatic Pressure
PGA	Polyglutamic Acid
DVS	Direct Vat Set

List of Appendices