

**OPTIMIZATION OF INGREDIENTS AND FERMENTATION DURATION OF
KOMBUCHA PRODUCED FROM COFFEE BYPRODUCTS (CBP)**

By

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STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.


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ABSTRACT

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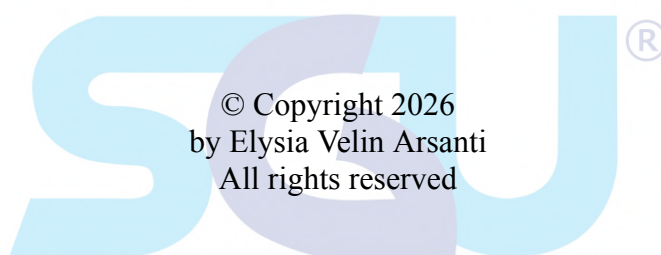
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Global coffee processing produces high amounts of coffee byproducts (CBP) annually. This research aims to investigate the feasibility of valorizing CBPs such as coffee cascara (CA), coffee silverskin (CS), and coffee pixel (PX) by utilizing them in kombucha. In the first stage of research, characterization of CBPs as kombucha ingredients, results showed that CBP tea contained lower antioxidant properties than black tea (BT), but exhibited comparable values after kombucha fermentation. In the second stage of research, Custom Optimal (Combined) design by Design Expert 13.0[®] was used to generate 16 trial designs of CBP kombucha utilizing CA, CS, and sugar for ingredients in kombucha production as numeric variation with different fermentation duration as categoric variation. Tested responses included pH, acid value, SCOBY growth, and hedonic acceptance as indicators of standard compliance and consumer acceptance. Optimization based on the responses of the trial designs resulted in 3 CBP kombucha formulations, all with 13 days fermentation time but with variation of CA, CS, and sugar content in the formulation. Validations of CBP kombucha with the highest desirability score of 0.79 fell within the 95% PI for tested parameters except for acid value. Further comparison with BT kombucha showed that CBP kombucha had a better sensory acceptance of 6.71 (“like slightly”) compared to conventional tea kombucha.

Keywords: kombucha, optimization, cascara, silverskin, fermentation.





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DEDICATION

I dedicate this work to my family and friends whose support and encouragement strengthened my every step of this long journey.



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May all praise and gratitude be expressed to God Almighty, in which this thesis titled “Optimization of Ingredients and Fermentation Duration of Kombucha Produced from Coffee Byproducts (CBP)” has been successfully completed. The completion of this thesis would not have been possible without the help and support from numerous parties as well. Therefore, the author would like to express their deepest gratitude to:

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The author hopes this thesis work can be beneficial to others and help towards the continuous improvement of scientific knowledge.

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