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Effect of Enzymatic Treatment and Sugar Germination of Robusta Coffee Beans on Antioxidants Assay, Fatty Acid and Colour in Comparison to Arabica

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Structured Abstract

Background: One of the most consumed drinks worldwide is coffee. Arabica coffee beans and Robusta coffee beans are the two main varieties of coffee. Arabica coffee is in higher demand in the market because of its better quality compared to Robusta coffee but it is more expensive and high cost of it. The cost of commercially available mixtures depends significantly on the percentage content of the more expensive. Studies have indicated that germination with the addition of enzymes and sugar significantly affects the antioxidant properties, fatty acid and colour of Robusta coffee beans.

Methods: The research methodology includes the sample preparation of five different treatments of Robusta coffee beans and drying, roasting and grinding. Moreover, the methodology includes the antioxidants analysis of total phenolic content and FRAP using a spectrophotometer, fatty acid profiles using gas chromatography and colour using the Chroma Metre CR-400 model.

Results: The results of this study show that R2 was the highest (206.51 ± 0.381^{a}) among all the samples but R4 (189.43 ± 1.153^{b}) was the closest with the Arabica sample (185.62 ± 0.764^{c}) for TPC value. For FRAP value, R4(10.824 ± 2.187^{a}) have the highest value but R2 (6.529 ± 2.430^{ab}) have the closest FRAP value with the Arabica sample (6.873 ± 2.916^{ab}). The fatty acids for R1 have the highest value for palmitic and stearic acids and all of this treatment of Robusta coffee cannot compete Arabica sample. For the color, L* value for R1(19.38 ± 0.56^{a}) have the highest value while R4 (16.34 ± 0.96^{c}) have the closest L* with Arabica sample (16.03 ± 0.60^{cd}). For the a* and b* values, it shows that R2 has the highest value among all Robusta samples, which are 9.45 ± 0.28^{a} and 13.31 ± 0.23^{a} while for the overall a* and b* values, R1(9.36 ± 0.37^{a}) and (13.05 ± 0.10^{a}) have the closest value with Arabica sample (9.22 ± 0.17^{a}) and (12.71 ± 0.18^{b}).

Conclusion: Therefore, by understanding the correct method of germination such as temperature and light, it can influence the final result of this research where it come out with the success result.

Keywords: Arabica coffee, Robusta coffee, Enzyme, Sugar, Germination

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