

The Effect of Three Combination of Honey on Total Phenolic Content by Using Response Surface Methodology.

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ABSTRACT

*Objectives/Research Problem:* Honey is a natural product produced by honey bees and consists of a complex mixture of sugars. As such, the effects of Trigona bee honey ( $X_1$ : 1.14-118.86 ratio), Mellifera honey ( $X_2$ : 1.14-118.86 ratio), and Dorsata honey ( $X_3$ : 1.14-118.86 ratio) on the overall level of the total phenolic content ( $Y_1$ ) were investigated in this study.

*Materials and Method:* Response surface methodology was used to evaluate the combination of Trigona bee honey, Mellifera honey and Dorsata honey that could achieve the maximum recovery of total phenolic content (TPC).

*Results and Discussion:* The highest TPC readings were obtained from the ratio of Trigona bee honey, Mellifera honey and Dorsata honey at 95:25:25. The second order of polynomial model ( $y = 0.27 + 0.03 X_1 - 0.021 X_2 - 0.020 X_3$ ) produced satisfactory results of the experimental data as the coefficient of determination ( $R^2$ ) for TPC was 0.5519, while its  $R^2$  (adjusted) was 0.4751, with an overall regression value of 0.0038. The value of lack-of-fit test was noted to be high with a reading of 0.1124 for the TPC analysis, signifying the suitability of the model in accurately predicting the variations. Predicted values for of TPC were in agreement with those of the experimental values.

*Conclusion:* Overall, the response surface methodology was successfully implemented in producing a model/equation that could give the highest combination effect on TPC value of Trigona bee honey, Mellifera honey and Dorsata where the highers contribution of phenolic content by Trigona bee honey.

**KEYWORDS:** Response surface methodology, total phenolic content, Trigona bee honey, Mellifera honey, Dorsata honey

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