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Effect of Concentration of Symbiotic Culture of Bacteria and Yeast on Physicochemical and Sensorial Profile of Red Dates Tea (*Ziziphus Jujuba mill)* Kombucha

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Structured Abstract

Background: Amidst the contemporary stressful environment, red dates, enriched with antioxidants such as vitamin C, are recognized for their potential in alleviating disrupted sleep and depression. Concurrently, Kombucha has demonstrated positive effects on gut health. This study aims to evaluate the impact of varying concentrations of SCOBY (Symbiotic Culture of Bacteria and Yeast) on red dates tea kombucha, comprehensively analyzing its physicochemical properties, alcohol content, cytotoxicity, microbial aspects, and sensory acceptability.

Methods: The red dates tea kombucha was prepared by slicing dried red dates into smaller pieces, washing them, and then measuring 60 g for every 1 liter of boiling water. Subsequently, the tea was allowed to cool, and the kombucha stock solution, along with the SCOBY layer, was introduced according to each formulation. Formulations F1, F2, and F3 corresponded to concentrations of 5%, 10%, and 15%, respectively.

Results: This study observed that red dates tea kombucha underwent a lightening and more yellowish transformation with prolonged fermentation. Formulation 1 exhibited the highest L* value at 28.01±0.02. As fermentation extended, the pH of the kombucha decreased, with Formulation 3 displaying the lowest pH after 7 days (2.59±0.01). A similar trend was observed for total soluble solids, with a reduction over the extended fermentation period, notably, Formulation 2 showed the highest difference between day 0 and day 7 values, with a 12% reduction in total soluble solids. Viscosity demonstrated no significant difference between the samples ($p<0.05$) at day 7, although there was an increasing trend from day 0 to 7. Alcohol levels increased but remained below 1%, adhering to halal requirements (F1: 0.86±0.05, F2: 0.88±0.07, F3: 0.69±0.13), with no significant differences observed on day 7 between the samples. Cytotoxicity testing indicated that all formulations survived at serial dilutions 2 through dilutions 8, and red dates tea kombucha showed the presence of Lactobacillus spp. In terms of optical density (OD650), Formulation 2 exhibited the highest value at 0.7083±0.006. Regarding sensory properties, consumer preferences leaned towards sweeter samples, with sweetness being the only attribute that showed statistical significance.

Conclusion: In conclusion, Formulation 2, with a SCOBY concentration of 10%, demonstrated optimal outcomes, suggesting it to be the most suitable concentration for achieving the desired results. These findings offer valuable insights that can serve as a reference for researchers and the food industry, aiding in the optimization of alcohol content and the control of physicochemical properties in red dates tea kombucha (RDTK).

Keywords: Kombucha, Red Dates, Symbiotic Culture of Bacteria and Yeast (SCOBY)

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