# EFFECTS OF EXTERNAL PARAMETERS ON PHYSICO-CHEMICAL PROPERTIES AND PERCENTAGE OF RECOVERY VOLUME OF RED DRAGON FRUIT (*Hylocereus polyrhizus*) ENZYMATIC DRINK (BROWN SUGAR LEMON SYSTEM)

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## ABSTRACT

In this study, red dragon fruit enzymatic drink was produced through natural fermentation and the effects of external parameters (headspace, duration and temperature of fermentation) on the physico-chemical properties (soluble solid content, water activity, total titratable acidity, pH and ethanol content) and percentage of recovery volume of the samples were studied using single factor experiments. Independent variables were coded at 4 levels (200g, 400g, 600g and 800g) for headspace, 4 levels (17, 21, 25 and 29 days) for duration of fermentation and 2 levels (25 and 37°C) for temperature of fermentation. Headspace exhibited significant effects ($p<0.05$) on final soluble solid content, final citric and lactic acid content, ethanol content as well as percentage of recovery volume. The physico-chemical properties of 800g formulation were 4.64% ethanol concentration, final soluble solid content of 19.5°Brix, final water activity of 0.938, final pH of 3.78, final total titratable acidity of 1.05% for citric acid and 1.48% for lactic acid while the percentage of recovery volume was 10.9%. Ethanol content, percentage of recovery volume, final soluble solid content, final pH and final lactic acid were significantly affected ($p<0.05$) by duration of fermentation. Sample day 21 demonstrated final soluble solid content of 24.6°Brix, 0.934 final water activity final, pH of 3.71, 0.59% ethanol content, 4.5% recovery volume, final citric and lactic acid of 0.78% and 1.10%, respectively. Meanwhile, temperature exerted significant effect ($p<0.05$) on final soluble solid content, final citric and lactic acid content, ethanol content and percentage of recovery volume. Sample fermented at 25°C showed 24.2°Brix final soluble solid content, 0.936 final water activity, pH 3.60, 5.25% ethanol content, 0.77% citric acid, 1.08% lactic acid and 5.4% of recovery volume. Temperature exhibited significant effects ($p<0.05$) on microbes test with $1.7 \times 10^5$ cfu/ml of yeast and mold and $3.1 \times 10^3$ cfu/ml of lactic acid bacteria. The test revealed the samples are not safe for consumption as the count was over the recommended limit.