

EFFECTS OF EXTERNAL FACTORS ON  
PHYSICOCHEMICAL PROPERTIES  
AND PERCENTAGE OF RECOVERY  
VOLUME OF RED DRAGON FRUIT  
(*Hylocereus polyrhizus*)  
ENZYMATIC DRINK  
CANE SUGAR LEMON  
SYSTEM

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## ABSTRACT

Fermented red dragon fruit drink has started to generate a great deal of consumer interest owing to its unique flavour as well as its potential health benefits. In current study, red dragon fruit enzymatic drink was produced through natural fermentation and the effect of external factors (fermentation headspace, fermentation duration and fermentation temperature) on physicochemical analyses (soluble solid content, water activity, pH, total titratable acidity, ethanol content) as well as percentage of recovery volume were investigated using single factor experiments. Independent variables were coded at 4 levels (200, 400, 600 and 800g) for fermentation headspace, 4 levels for fermentation duration (17, 21, 25 and 29 days) and 2 levels for fermentation temperature (25 and 37°C). The result showed that external factors significantly ( $p < 0.05$ ) affected the physicochemical characteristic as well as percentage of recovery volume of red dragon fruit enzymatic drink. Headspace exerted significant effect ( $p < 0.05$ ) on all physicochemical analyses and percentage of recovery volume except final lactic acid and citric acid content. Sample 800g demonstrated 24.9°Bx of soluble solid content, 0.939 water activity, 1.30% lactic acid, 0.92% citric acid, pH 3.51, 0.96% of ethanol content and 53.9% of recovery volume. On the other hand, duration significantly affected ( $p < 0.05$ ) all physicochemical analyses and percentage of recovery volume whereby red dragon fruit enzymatic drink which was fermented for 21 days exhibited 23.6°Bx of soluble solid content, 0.938 water activity, 1.06% lactic acid, 0.76% citric acid, pH 3.31, 1.34% ethanol and 45.38% of final recovery volume. All physicochemical analyses and percentage of recovery volume were temperature dependent whereby final soluble solid content, final lactic acid and final citric acid content were positively correlated to temperature while final water activity, final pH, ethanol content and final percentage of recovery volume were inversely correlated to temperature. Higher yeast count was associated with fermentation at 25°C whereas higher bacterial count was coupled with fermentation at 37°C with  $1.90 \times 10^6$  cfu/mL and  $1.65 \times 10^3$  cfu/mL, respectively.