



SYSTEMATIC EVALUATION OF A PROCESS FOR THE PRODUCTION OF MEADS BASED ON COLOMBIAN MONOFLORALS HONEYS

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INTRODUCTION

Mead is a fermented alcoholic product made with yeasts (*Sacharomices cerevisiae*). It is made from honey must with or without blends of other inputs. The objective of this work was the elaboration of meads with monofloral honeys of Eucalyptus, Encenillo and Matarratón, optimizing water, honey and yeast, in a discontinuous system (Batch) at a temperature of 32°C. Some meads can have between 7% and 15% ethanol and a wide range of compounds such as sugars, acids, vitamins, antioxidants and minerals among others.

MATERIALS AND METHODS



Figure 1. Transformation of ethanol and CO₂ during the fermentation process into monofloral mead musts

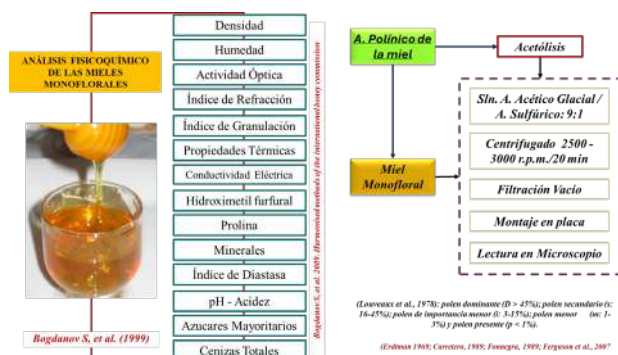
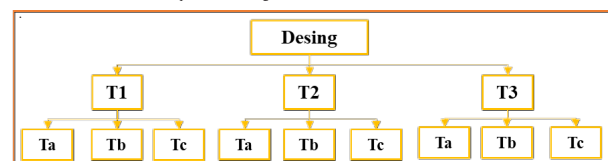


Figure 2. Determination of the Botanical Origin and Physicochemical Analyses of Colombian Monofloral Honeys

During fermentation, 27 reactors were used with musts inoculated with 0.30, 0.40 and 0.60 g/l of yeast. The transformation of sugars, volatile and total acids was evaluated using the Sigmoidal-Logistic mathematical model. The measurement of OH⁻ and CO₂ was adjusted to the Sigmoidal-Slogistic1 mathematical model with logarithmic interaction of Levenberg Marquart.

Table 1. Raw material and experimental design for meads



T1: Encenillo; T2: Eucalipto y T3: Matarratón (Ta-0,30; Tb-0,40; Tc-0,60)

RESULTS AND DISCUSSION

The results showed a decrease in soluble solids during the fermentation process, from 22.2 ± 0.40 to 9.10 ± 0.05 °Brix. The ethanol fraction in the musts evolved with the increase of yeast; for the meads it was in the range of 8.34 ± 0.22 to 11.2 ± 0.33 g.L⁻¹. For the evaluation of the kinetics, the statistical package OriginPro2016 was used. Carbon dioxide evolution showed a higher reaction rate in musts with higher yeast levels, from 17.4 ± 0.06 to 20.8 ± 0.70 g.L⁻¹ accumulated during the 11 days of fermentation. The final product was evaluated in terms of ethanol fraction, soluble solids, total acidity, volatile acidity and carbon dioxide.

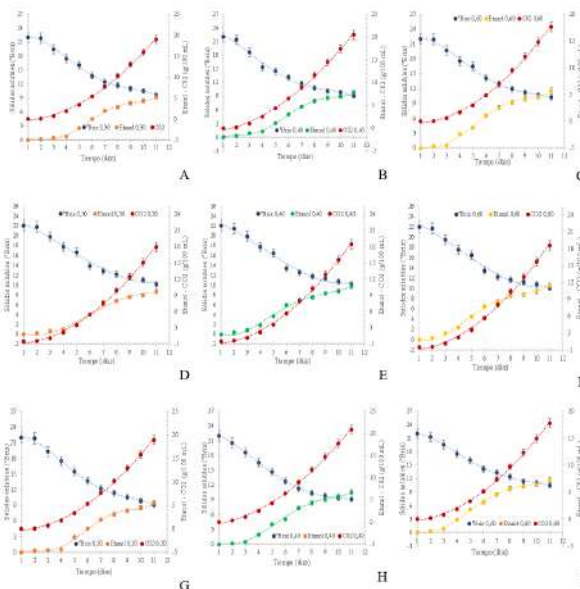


Figure 7. Transformation of ethanol and CO₂ during the fermentation process into monofloral mead musts

CONCLUSIONS

Research has shown that the greater the number of microorganisms, the greater the efficiency of the process. However, high concentrations of yeast cannot be used during the beginning of the process because it generates unpleasant conditions in the final product

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Mead production plays a crucial role in the transformation of honey, offering economic, nutritional and cultural benefits, representing a dynamic process in a complex and valuable beverage. The growing craft industry is driving innovation in styles, flavors and production methods, making mead an increasingly popular choice among consumers worldwide. The objective of this study focused on optimizing Colombian meads using monofloral honey from eucalyptus (*Eucalyptus globulus* Labill.), encenillo (*Weinmannia tomentosa* L.f.) and matarratón (*Gliricidia sepium* (Jacq.) Walp.), from Villanueva (Casanare), Paipa (Boyacá) and Mariquita (Tolima), Colombia. The research focused on developing a value-added product by evaluating the physicochemical properties of the raw material and conducting pollen analysis to confirm its botanical origin. A batch fermentation system was used at room temperature with musts at 22 °Brix and three yeast levels (0.30, 0.40, and 0.60 g·L⁻¹) of *Saccharomyces bayanus*. Fermentation kinetics were analyzed using a Sigmoidal-Logistic model, assessing ethanol and carbon dioxide production through Levenberg-Marquardt logarithmic interaction. Results showed a decrease in soluble solids from 22.2 ± 0.40 to 9.10 ± 0.05 °Brix. Ethanol content increased with yeast concentration, ranging from 8.34 ± 0.22 to 11.2 ± 0.33 g·L⁻¹. Carbon dioxide production was highest in musts with greater yeast levels, accumulating between 17.4 ± 0.06 and 20.8 ± 0.70 g·L⁻¹ over 11 days. The final product was evaluated in terms of ethanol content, soluble solids, total acidity, volatile compounds, and carbon dioxide, providing valuable insights into the fermentation process and product development. Mead production is not just an alternative use for honey but a sophisticated transformation process that enhances its value, extends its utility, and contributes to both economic and cultural sustainability. Its rising popularity in the craft beverage industry further highlights its importance in modern food and drink markets.