

## ANALYSIS OF pH AND ACETIC ACID IN FERMENTED COFFEE BEVERAGE USING KOMBUCHA CULTURE

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### Introduction

Kombucha is a beverage traditionally obtained from the fermentation of *Camellia sinensis* tea by a symbiotic culture of bacteria and yeast (SCOBY) (Jayabalan et al., 2014). This beverage has become very popular in the last years due to its potential effects on human health. The consumption of potentially functional drinks has encouraged research on beverages as a vehicle for health promotion. In this context, coffee beverage appears as an option for the diversification of substrates to produce kombucha, besides being one of the most consumed beverages in the world, it is a source of bioactive compounds. In Brazil, the kombucha Identity and Quality Standard is regulated by the Normative Instruction (NI) No. 41, of September 17, 2019, of the Ministry of Agriculture, Livestock and Supply, which establishes the analytical parameters and conditions for producing this beverage. The aim of this study was to analyze the pH and determine the acetic acid content of a beverage produced with coffee fermented using SCOBY, over 21 days of fermentation.

### Method

The beverages were prepared from infusions of roasted and ground commercial coffee (*Coffea arabica* L.), with 2% of coffee (w/v) and 5% of sucrose, in quintuplicate. After cooling the infusion, SCOBY (5%) and a volume of the previously fermented beverage (10%) were added. The beverages were kept at a room temperature of  $25 \pm 3^\circ\text{C}$ , and evaluated at the fermentation times of 0, 3, 6, 9, 12, 15, 18 and 21 days. The fermented beverage was filtered using Whatman paper n° 5, to remove cellulose residues. The pH values were measured using a previously calibrated potentiometer, and the acetic acid content, by titration, with a NaOH 0.1 M solution and phenolphthalein, as an indicator. The results were presented through the mean and standard deviation of the individual experiments of five prepared beverages.

### Results and Discussion

During the 21 days of fermentation, the pH decreased, with a variation from  $4.47 \pm 0.23$  to  $3.29 \pm 0.07$ . On the other hand, the acetic acid content increased, with a maximum content equivalent to  $7.0 \pm 0.10$  g / L, on the last day of fermentation. These results can be explained through the production of organic acids by the symbiotic culture of bacteria and yeast, present in SCOBY. Mainly acetic acid was produced, which, consequently, contributes to the increase in the acidity of the beverage (Jayabalan et al., 2014). Therefore, the increase in organic acids is directly related to the decrease in pH during the fermentation of the beverage. NI No. 41 (Brasil, 2019) determines that the pH of the kombucha must be in the range of  $\geq 2.5$  to  $\leq 4.2$ , and no value for titratable acidity is present. In this sense, the beverage produced in this study has a pH parameter according to the established by the Brazilian legislation for kombucha beverage and according to others authors regarding acetic acid that ranged from 0.5 to 9.08 g / L (Jakubczyk et al., 2020).

## **Conclusion**

The increase of acetic acid content and the decrease of pH observed during fermentation showed the presence of metabolic activity of SCOBY in this coffee infusion. The fermented coffee beverage presented parameters that are in agreement with NI No.41 and the literature, which revealed the possibility of its use as an alternative substrate in the kombucha production.

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