INFLUENCE OF CONCENTRATION OF PASSION FRUIT PULP FROM CAATINGA \textit{(Passiflora cincinnata} Mast.) ON THE VIABILITY OF \textit{Lactobacillus rhamnosus} ATCC7469 DURING FERMENTATION

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1. INTRODUCTION

The insertion of probiotics in matrices that favor their survival and the fermentation process is essential to extend the shelf life of these products (FILHO et al., 2019). The lactic fermentation generates products that increase the acidity of the medium and inhibit the growth of pathogens, preventing an accelerated deterioration of the food. However, for this fermentation to occur and for the probiotic to be effective, the insertion medium needs to offer components that keep the microorganisms viable. With this in mind, the use of fruit pulp has been gaining ground in the production of probiotic beverages, because it contains a composition rich in nutrients and has attractive sensory characteristics. The passion fruit of the Caatinga (\textit{Passiflora cincinnata} Mast.), a species native to northeastern Brazil, is nutritionally rich fruit, with vitamins, fibers, flavonoids, and other functional substances. \textit{Lactobacillus rhamnosus} ATCC 7469 has been increasingly studied in conjunction with the passion fruit pulp from Caatinga for presenting excellent adaptation to the environment (FARIAS et al., 2016; SANTOS et al., 2017; ANDRADE et al., 2019). However, the viability of probiotics in fruit juices depends on some factors, such as type of strain, pH, and substances in the culture medium (LILLO-PÉREZ et al., 2021). Thus, this study aimed to analyze the influence of passion fruit pulp concentration on the viability of \textit{L. rhamnosus} ATCC7469 during fermentation.

2. MATERIALS AND METHODS

Initially, 2 mL of the microbial suspension, kept in glycerol at -20°C, was inoculated into 50 mL of MRS broth (from Man, Rogosa, and Sharpe) in an Erlenmeyer flask, and subsequently incubated at 37 °C for 18 hours. In the preparation of the beverages, an inoculum of 10% (V/V) was transferred to the culture medium, prepared by diluting the pasteurized pulp of the passion fruit from the Caatinga. Three pulp concentrations were used: 20, 35, and 50% (V/V). The initial pH of the beverages was adjusted to 6 before pasteurization. Beverages inoculated with \textit{L. rhamnosus} ATCC 7469 were placed in an oven (SP-101/216, LABOR) at 37°C. Initial viability was 6.5 Log CFU/mL. The viability, expressed in Colony Forming Units per milliliters (CFU/mL), was analyzed after 24 hours of fermentation. A volume of 1 mL of each beverage was used for viability analysis, performed after serial dilution in 0.9% saline solution (m/V) and subsequent Spread-Plate in MRS-agar medium. The plates were incubated in the oven at 37°C. After 48 hours, the counting was performed. The pH was analyzed using a digital potentiometer (P62000, Gehaka). In addition, before and after fermentation of the beverages, the concentrations of fructose, glucose, and lactic acid were analyzed using high-performance liquid chromatography.
3. RESULTS AND DISCUSSION

Beverages formulated at lower pulp concentrations (20% v/v) proved to be an excellent vehicle during fermentation, as they presented higher growth variation, reaching a final viability of 8.4 Log (CFU/mL), higher concentration of lactic acid (11.57 g/L) and pH of 4.2, ideal for product conservation. Fermentations using passion fruit pulp from Caatinga concentrations below 20% (V/V) and *L. rhamnosus* ATCC 7469 have been used (FARIAS et al., 2016; SANTOS et al., 2017). Farias et al. (2016) report that, with 20 hours of fermentation, the viability increased about 2 Log (CFU/mL), using 14.45% (V/V) of the pulp. According to Lillo-Pérez et al. (2021), the minimum amount of probiotic cells needed per product to ensure benefits to the gut microbiota is 6 Log (CFU/mL). The pH values decreased in the three fermentations. The increase in acidity occurs due to the production of lactic acid during the fermentation process, and this change in pH is a characteristic that helps in the conservation of fermented foods (ADEBAYO-TAYO et al., 2021). Some bacteria, such as *L. rhamnosus*, can grow in media with more acidic pHs, but most pathogens do not support this condition, with acidity being an example of an antimicrobial agent (FARIAS et al., 2016).

4. CONCLUSIONS

It was observed that the low concentration of passion fruit pulp from the Caatinga promoted higher viability during fermentation and that this may be related to the fermentation time. In this way, the concentration had an influence on time and, consequently, on the final viability and pH, important factors in the development of a product. Studying better ways to combine these factors is of great relevance to achieve better results in the production of probiotic foods. Therefore, more studies are needed to aggregate the research and prove the study hypothesis.

5. REFERENCES


