PROXIMATE COMPOSITION OF MUNGUBA (*Pachira aquatica*) SEED YOGURT ALTERNATIVE

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Introduction

Given the population growth, coupled with the increasing recognition of food intolerances, such as lactose intolerance and allergies to milk proteins, as well as the adoption of vegetarian and vegan dietary practices, there has been a rising trend towards plant-based beverages as alternatives to milk [1]. However, plant-based milk alternatives present some limitations, such as their nutritional value and short shelf life. To address these issues, lactic fermentation has been applied, also contributing to the diversification of products derived from these plant-based milks [1, 2]. In this context, the diversification of plant raw materials is also important for expanding the nutritional variety of these products. A promising plant source is munguba, a tree species (*Pachira aquatica*) native to Latin America. Classified as an Unconventional Food Plant (UFP), munguba currently lacks market value and its consumption is limited to certain regions of the Amazon [3]. Thus, the development of a munguba seed yogurt analogue, in addition to adding value to an UFP, can contribute to providing health-beneficial nutrients in the diet. Therefore, the objective of this study was to develop a munguba seed yogurt analogue and determine its proximate composition.

Material and Methods

The fruits were collected at Quinta da Boa Vista park (Rio de Janeiro). The species was deposited in the UFF Herbarium (NIT 12350), and the project was registered in SisGen (no. A18D314). The plant-based milk alternative was produced following these steps: seed sanitization, peeling, blanching, grinding in the presence of water (1:4 w/v), and filtration through a conical sieve. To produce the munguba seed yogurt analogue, dextrose was added at a proportion of 5% (w/v), followed by the addition of Yoflex® Harmony 1.0 starter culture (0.01% w/v), containing *Streptococcus thermophilus*, *Lactobacillus delbrueckii* subsp. *bulgaricus*, and *Lactobacillus fermentum*. Fermentation was carried out at 36°C until the pH reached 4.5 [4, 5]. After packaging, the product was stored under refrigeration at 5°C. The proximate composition was evaluated according to Adolfo Lutz methods: moisture content was determined by oven drying at 105°C, ash by incineration in a muffle furnace at 550°C, protein by the Kjeldahl method (conversion factor = 6.25), lipids by the Bligh-Dyer method, and carbohydrates by the Lane-Eynon method [6]. Results were calculated using descriptive statistics with Microsoft Excel 2019.

Results and Discussion

The proximate composition of the munguba seed yogurt analogue includes 91.93 g/100 mL of moisture, characteristic of a liquid food. Regarding nutrients, it contains 0.92 g/100 mL of lipids, 0.56 g/100 mL of proteins, 0.29 g/100 mL of ash, and 9.77 g/100 mL of carbohydrates, of which 9.14 g/100 mL are reducing sugars, and 0.57 g/100 mL represents starch-equivalent carbohydrates. These results are summarized in Table 1.

Table 1 - Proximate composition of the fermented water-soluble extract of munguba

Component (g/100 mL)	Mean ± SD
Moisture	91.93 ± 0.13
Ashes	0.29 ± 0.00
Lipids	0.92 ± 0.03
Proteins	0.56 ± 0.03
Carbohydrates	9.77 ± 0.05
Reducing sugars	9.14 ± 0.07
Starch	0.57 ± 0.11

Among the macronutrients, carbohydrates were the predominant component due to the added sugar aimed at initiating the fermentation of lactic acid bacteria. Within this total fraction, it was possible to estimate the starch content of the beverage, which is a common polysaccharide in seeds [7]. Another nutrient that stood out proportionally was lipids, as munguba seeds are oleaginous [3]. Although the protein content is lower than that of the other macronutrients, it is consistent with observations in other plant-based yogurt analogues [8]. Finally, the ash content corresponds to the inorganic fraction of the sample, composed mainly of minerals [9]. In summary, the composition highlights nutritional profile of the munguba seed yogurt analogue, suggesting its potential as a valuable addition to plant-based diets.

Conclusion

In conclusion, the development of the munguba seed yogurt analogue demonstrates its potential as a nutritionally diverse plant-based product, offering a promising alternative within the growing market of non-dairy beverages, while also contributing to the valorization of an underutilized, nutritionally rich plant source.

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