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Stability of *bocaiuva* (*Acrocomia* spp.) mass candy stored in different packages

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Abstract

Bocaiuva (*Acrocomia* spp.) is a fruit native to areas of Cerrado and Pantanal that stands out for its nutritional value, presence of bioactive substances, and high pulp yield. The aim of this study was to develop a mass candy of *bocaiuva*, characterize it physicochemically, quantify the retention of bioactive substances, evaluate the physicochemical and microbiological stability and sensorial acceptance for up to 120 days, and verify the effect of different types of packages and storage time on the developed product quality. The prepared mass candy was stored in plastic packages of terephthalate polyethene that were transparent and metallized. We have characterized its centesimal composition and microbiological and sensorial stability, evaluating its color, moisture, pH, soluble solids, titrable acidity, retention of ascorbic acid, carotenoids, total phenolics, and antioxidant capacity. The results indicated that the *bocaiuva* mass candy stays stable for physicochemical, microbiological, and sensory parameters over storage and that the metallized polyethene terephthalate package best conserves the bioactive substances.

Keywords: *Acrocomia* spp.; bioactive substances; native fruit; new food; nutritional value.

Practical application: To avoid post-harvest loss, besides stimulating *bocaiuva* commercialization and valuation.

1 INTRODUCTION

The genus *Acrocomia* (family Arecaceae), popularly known as *bocaiuva* or *macaúba*, is distributed in the central and southern regions of South America do Sul, in areas of Cerrado (Lima et al., 2018) and Pantanal. The edible fruit has a fibrous-mucilaginous texture and a sweet taste (Lorenzi et al., 2015). The pulp is a source of fibers, carbohydrates, and minerals (Ramos et al., 2008), carotenoids, ascorbic acid, phenolic compounds, and antioxidant activity (Souza et al., 2019), and, except tryptophan, it contains all other essential amino acids at the levels above than recommended (Munhoz et al., 2018). Given its high content of lipids, especially oleic acid, it has a promising nutritional and functional potential (Costa et al., 2020).

The *bocaiuva* (*A. totai* Mart.) pulp can be consumed *in natura* and utilized in the confection of jams, cakes, ice creams, popsicles, and processed as flours (Damasceno-Junior & Souza, 2010). Its physicochemical characteristics present desirable patterns for the elaboration of agroindustrial products (Mooz et al., 2012), mainly for its high pulp yield of 41% regarding total fruit mass (Munhoz et al., 2012).

The utilization of *bocaiuva* pulp in elaborating new food products allows for minimizing post-harvest losses and offers consumers a product with high nutritional value (Silva et al., 2018); besides meeting market demand, consumers are more aware of healthy eating habits and food origin (Porpino & Bolfe, 2020) and look for products with a natural and functional appeal (Reis & Schmiele, 2019).

The elaboration of sweet foods is a way to conserve the pulp nutrients. During preparation, the heat treatment concentrates sugars, favoring increased product shelf life (Krolow, 2009) and impeding the development of microorganisms (Oliveira et al., 2018).

The *bocaiuva* palm has a high fruit yield and a production chain in Mato Grosso do Sul, mainly composed of communities and settlements that process the fruit into sweets, flours, and nut extraction (Santos Júnior et al., 2012). To link the demand for new food products to native fruits, incentivizing their commercialization and valuation is a way to offer consumers healthy food, elaborated with natural ingredients, without added preservatives, and produced sustainably, including higher ingestion of nutrients and bioactive substances. Besides, it is a new income opportunity for extractivist communities.

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Given the exposure, this work aimed to develop a new food product with the *bocaiuva* pulp, characterize its physicochemical stability, and assess microbiological and sensorial parameters during storage for up to 120 days.

2 MATERIAL AND METHODS

2.1 Raw matter and elaboration

The *bocaiuva* pulp was acquired in the commerce of Corumbá-MS and kept frozen until preparing the candy. The pulp was subjected to boiling with water for 10 min (a proportion of 1:4 pulp and water) in a stainless-steel pan. After cooking, it was homogenized in a blender (Philco®) to obtain the prepared *bocaiuva* pulp.

The ingredients utilized to produce the mass candy were the prepared *bocaiuva* pulp, crystal sugar, high-methoxylation citric pectin, and citric acid. The ingredients were homogenized, and the mass candy was concentrated in an open pot until 62 °Brix, approximately. The mass candy was poured into plastic forms and, after cooling, bagged in two types of packages: transparent polyethene and transparent terephthalate polyethene (PE/transparent PET), impermeable to water vapor and oxygen, and transparent polyethene and metallized terephthalate polyethene (PE/metallized PET), impermeable to water vapor, oxygen, and light. The packages were sealed in a vacuum packing machine (Jetvac, model Jet 40) and stored at ambient temperature for up to 120 days.

Access to the genetic patrimony was registered at SisGen, number AB3CD50, besides the patent deposit for the mass candy produced, number BR1020220134154.

2.2 Centesimal composition

We have characterized the fresh mass candy according to the analytical rules of the Instituto Adolfo Lutz (2008) in three replicates, regarding moisture through the gravimetric method in an oven at 105 °C, fixed mineral residue through sample calcination in a muffle at 550 °C, proteins by the classical *Kjeldahl* method, and lipids using the *Soxhlet* method. Total carbohydrates (*Nifext* fraction) were quantified by differences with the other fractions, according to the Association of Official Analytical Chemistry (2005). The total energetic value was determined by applying the *Atwater* conversion factor (Merrill & Watt, 1973).

2.3 Physicochemical stability

The mass candies were stored at ambient temperature for up to 120 days, when the maximum and minimum temperatures were 29.3 and 18.4 °C, respectively, and the maximum and minimum relative air humidity values were 74.18 and 30.17%, respectively. The mass candies were evaluated for color, moisture content, pH, soluble solids (SS), titrable acidity, ascorbic acid, total carotenoids and phenolics, and antioxidant capacity during storage.

The color was determined utilizing a portable spectrophotometer (*Konica Minolta*® model CM-2300d). The results were expressed in L^*, a^*, and b^*, where L^* represents luminosity, varying between 0 (without luminosity or black) and 100 (white), a^* represents the colors from red ($+a^*$) to green ($-a^*$), and b^* from yellow ($+b^*$) to blue ($-b^*$), according to the color scale $L^*a^*b^*$ of the *Commission Internationale I-Eclairage* (CIE).

Moisture content was assessed according to the rules of Instituto Adolfo Lutz (2008), while pH was obtained using a potentiometer (*Tecnopon*, model MPA-210/MPA-210P). The SS content was expressed in °Brix and determined using a digital refractometer (*Hanna Instruments*® HI 96801). The titrable acidity was determined by titration with a standard solution of sodium hydroxide (0.1 M) and phenolphthalein at 1% as an indicator (Instituto Adolfo Lutz, 2008). The ascorbic acid content was quantified by the titrimetric method using 2,6 sodium dichlorophenol-indophenol at 0.1% (Rangana, 1977).

The total carotenoids were determined according to the method described by Rodríguez-Amaya and Kimura (2004). Total phenolics and the antioxidant capacity were evaluated in hydroethanolic extracts (Roesler et al., 2007) submitted to the colorimetric reaction of determination of phenolic compounds and half-maximal inhibitory concentration (IC50), defined as the final concentration of the integral extract required to describe the initial concentration of 2,2-Diphenyl-1-picrylhydrazyl (DPPH) in 50%, following Swain and Hillis (1959).

2.4 Microbiological stability

Before the sensory assessment of the mass candy, microbiological analyses were performed at times 0 and 120 days, beginning and end of storage. The analyses were conducted using the plating technique on a 3M™ Petrifilm™ plate, evaluating the rapid counting of molds and yeasts, enterobacteria, and the research on *Salmonella Express*, following the Normative Instruction No. 161 of July 1, 2022 (Brasil, 2022a).

2.5 Sensory analysis

The sensory analysis was performed in two steps on different days. In step 1, the mass candy was evaluated at time 0; in step 2, the mass candy was evaluated at time 4 after 120 days of storage at ambient temperature, considering the previous results obtained in the physicochemical and microbiological stability analyses. The Ethics Committee in Research with Human Beings of UFMS approved the proposed sensory analysis with the CAAE number 09336919.6.0000.0021. Step 1 was performed with 109 participants, and step 2 with 60. We have evaluated acceptability and purchase intention.

The acceptance was determined by applying an affective test using a hedonic scale of 7 points, varying from "I liked it very much" (score 7) to "I disliked it very much" (score 1) concerning the specific attributes of look, color, texture, aroma, taste, and overall aspect. The purchase intention was determined by an affective test of intention, considering the variables between the extremes "certainly would not buy" (score 1) and "certainly would buy" (score 5). The preference was obtained by inference (Instituto Adolfo Lutz, 2008). The acceptability index (AI) was calculated according to Dutcosky (2013).

2.6 Statistical analyses

The data on physicochemical stability were evaluated utilizing an entirely randomized design of factorial 2×5 (two types of packages and five storage times) by analysis of variance using the Statistica 7.0 software. Means were compared using the Tukey test at 5% probability. For comparisons, the results were converted to 32.77% moisture. We applied the Tukey test at 5% probability to compare the means obtained in sensory analyses.

Stability was assessed by observation of the results of physicochemical, microbiological, and sensory analyses during storage, considering that the product is inappropriate for consumption from the moment it loses that.

3 RESULTS AND DISCUSSION

3.1 Centesimal composition

The RDC 726 of July 1, 2022, which regulates the health requirements for edible mushrooms, fruits, and plant products, does not establish a maximum moisture limit in mass candies made from fruits (Brasil, 2022b). The moisture level found in *bocaiuva* mass candy was 32.16 g 100 g^{-1}, close to the reported value of 33.50 g 100 g^{-1} by Vieira et al. (2021) in yellow *araçá* (*Psidium cattleyanum* Sabine, a guava-like berry) mass candy. Moisture is directly related to shelf life since increased water content favors the development of microorganisms (Sarantopoulos et al., 2001); nevertheless, that was not observed in the product, mainly due to the low pH of the candy and the processing under high cooking temperatures.

The results for fixed mineral residue and proteins were 0.39 and 0.46 g 100 g^{-1}, respectively, below those Munhoz et al. (2018) found in *bocaiuva* pulp, of 3.26 g 100 g^{-1} for fixed mineral residue and 3.34 g 100 g^{-1} for proteins. The low values were due to the small proportion of *bocaiuva* pulp used in making the candy and its mixing with the other ingredients.

The lipid content was 0.98 g 100 g^{-1}, superior to 0.40 g 100 g^{-1} reported by Vieira et al. (2021) for the abovementioned *araçá* mass candy. That difference can be attributed to the high lipid content in *bocaiuva* pulp, which is composed mainly of monounsaturated fatty acids with a higher concentration of oleic acid (Amaral et al., 2019), or approximately 62% of the total extracted oil (Munhoz et al., 2012).

In the organism, oleic acid regulates the gene activity that causes mitochondrial dysfunction responsible for incomplete oxidation of fatty acids, a factor involved in the start and development of insulin resistance, and eventually, type-2 diabetes mellitus (Rehman et al., 2020); thus, it is essential to consume foods containing oleic acid.

We found 66.01 g 100 g^{-1} of total carbohydrates and 274.7 kcal 100 g^{-1} of total energetic value, respectively, due to the technological process used that promotes sugar concentration, consequently increasing its energetic value and inhibiting the development of microorganisms, besides contributing to the taste and texture of mass candies (Cunha et al., 2016).

3.2 Physicochemical stability

The mass candy packaged in PE/metallized PET presented a higher mean for luminosity (L^*), a lighter color than the mass candy stored in PE/transparent PET. However, there was no significant difference in storage time for the same parameter (Table 1).

The package type did not significantly influence the parameters a^* and b^* of the *bocaiuva* mass candy. During storage, the means remained stable (Table 1). When positive, the values de a^* and b^* represent tones of red and yellow. The color of the *bocaiuva* pulp was evaluated by Silva et al. (2018), who reported values of 42.18, 10.95, and 40.22 for L^*, a^*, and b^*, respectively, higher than those found. The difference between values of a^* and b^* can be due to processing that reduced the level of carotenoids, a bioactive sensitive to heat (Koop et al., 2022), which gives the pulp an orange color.

No significant difference in moisture was detected in the concerning packages (Table 2). However, during storage, the moisture content increased from 28.09% at time 0 to 34.17% at 120 days, indicating possible permeability to water vapor in the packages.

Silva et al. (2018) evaluated *bocaiuva* jelly with passion fruit and found a moisture content of 27.19%, close to time 0 of the present study. In sweets, moisture gain can make the product sticky and cause changes in color, flavor, and aroma (Sarantopoulos et al., 2001), which was not observed in the mass candy of *bocaiuva* during storage.

The titrable acidity did not differ significantly concerning package type. However, time 0 exhibited the highest value, and the other times did not differ during storage (Table 2). That can have occurred because time 0 had the lowest moisture level, increasing during storage. In jams, with a similar formulation to mass candies, the acidity should be below 1% to avoid syneresis (Jackix, 1988). The values found are within the expected and were did nor observe the syneresis process. In oily raw materials such as *bocaiuva* pulp, high levels of acidity indicate

Table 1. Color of the *bocaiuva* mass candy by function of packages and storage time.

Treatment	L^*	a^*	b^*
PE/transparent PET	31.91b	3.75a	9.17a
PE/metallized PET	34.50a	3.60a	9.07a
F-test	6.76*	0.30 NS	0.24 NS
Time (days)			
0	33.66a	3.56a	9.20a
30	33.58a	3.54a	9.54a
60	33.19a	3.50a	8.47a
90	32.67a	4.10a	9.49a
120	32.93a	3.68a	8.90a
F-test	0.14 NS	0.66 NS	0.33 NS
Treatment × Time	0.73 NS	1.43 NS	1.31 NS
CV (%)	0.0008	0.0019	0.0019

Means followed by the same lowercase letter in the column do not differ by the Tukey test ($P < 0.05$); Color: CIE Lab; L: luminosity; a: (positive = red; negative = green); b: (positive = yellow; negative = blue); *Significant; NS: non-significant; CV: coefficient of variance; Calculation: sample with 32.77% (wet base) of moisture.

susceptibility to rancidity, as observed by L. P. R. Silva et al. (2023) in *bocaiuva* nut oil.

We did not observe significant differences in pH during storage (Table 2), and the values were considered optimal for the gel consistency of the mass candy, which should be around 3.2 (Oliveira et al., 2018). The content of SS did not differ between packages but was observed to have a slight variation over storage (Table 2); nevertheless, it stayed within the expected range, close to 62 °Brix. Associated with acidity and pH, the content of SS plays a significant role in the candy texture, conferring consistence and creaminess, besides favoring conservation (Cunha et al., 2016).

The mass candy in the PE/metallized PET package showed the highest means for bioactive substances (Table 3). Such substances are chemically unstable when exposed to light (Koop et al., 2022), which explains why the package with a metallized barrier best preserved the bioactives.

The total carotenoid content was significantly higher in the PE/metallized PET package than in the PE/transparent PET package (Table 3). Carotenoids are photosensitive pigments (Ambrósio et al., 2006); thus, because the metallized package has a barrier against light, it preserved 69% of compounds vs. 49% of retention in the transparent package after 120 days of storage. During storage, the total carotenoid content diminished but was still retained at 63%, despite the high temperatures involved in the elaboration process of the mass candy. However, only time 0 differed significantly from the others (Table 3). Garnes et al. (2022) observed a significant reduction in the retention of carotenoids in dehydrated *bocaiuva* pulp stored in different packages between 0 and 30 days, a result similar to that found.

The main carotenoid found in *bocaiuva* pulp is β-carotene, corresponding to 80% of the total (Ramos et al., 2008). In the organism, β-carotene is converted into vitamin A, which is essential for body functions such as vision health and strengthening the immune system (Alashry & Morsy, 2021). Carotenoids help protect the retina and crystallin from potential photochemical damages induced by light; given their antioxidant power, they help to eliminate free radicals, protecting the eyes from oxidative stress and inflammation (Johra et al., 2020). They must be obtained by ingesting fruits and vegetables, as they are not synthesized in organism (Eggersdorfer & Wyss, 2018).

Table 2. Physicochemical characterization of *bocaiuva* mass candy by function of packages and storage time.

Treatment	Moisture (%)	pH	Soluble solids (°Brix)	Titrable acidity (g 100 g^{-1})
PE/transparent PET	32.65a	3.29a	60.57a	0.75a
PE/metallized PET	32.83a	3.25b	61.54a	0.74a
F-test	0.86 NS	4.6*	1.86 NS	0.91 NS
Time (days)				
0	28.09b	3.31a	57.77b	0.81a
30	32.24a	3.30a	60.33ab	0.72b
60	33.52a	3.23a	62.58a	0.75b
90	34.91a	3.28a	62.79a	0.73b
120	34.17a	3.23a	61.81a	0.73b
F-test	15.23*	3.6 NS	6.69*	10.32*
Treatment × Time	0.49 NS	0.5 NS	0.46 NS	0.26 NS
CV (%)	0.000823	0.000173	0.000123	0.000775

Means followed by the same lowercase letter in the column do not differ by the Tukey test ($P < 0.05$); *Significant; NS: non-significant; CV: coefficient of variance; Calculation: sample with 32.77% (wet base) of moisture.

Table 3. Content of bioactive substances of the *bocaiuva* mass candy by function of packages and storage time.

Treatment	Carotenoids (μg 100 g^{-1})	Phenolics (mg 100 g^{-1})	Ascorbic acid (mg 100 g^{-1})	Antioxidant activity (μg mL^{-1})
PE/transparent PET	539.28b	25.75a	4.26b	1,149.3a
PE/metallized PET	700.00a	26.11a	5.72a	849.40b
F-test	26.99*	0.07 NS	66.70*	68.96*
Time (days)				
0	812.35a	24.96a	6.68a	796.22c
30	567.42b	24.47a	5.36b	1,082.50a
60	637.38b	27.15a	4.06c	898.73bc
90	563.34b	26.86a	4.59bc	1,181.1a
120	517.70b	26.21a	4.24c	1,038.2ab
F-test	11.23*	0.59 NS	28.76*	14.23*
Treatment × time	1.42 NS	0.16 NS	4.59*	2.56*
CV (%)	0.002207	0.001011	0.002903	0.002207

Means followed by the same lowercase letter in the column do not differ by the Tukey test ($P < 0.05$); *Significant; NS: non-significant; CV: coefficient of variance; Calculation: sample with 32.77% (wet base) of moisture.

The content of total phenolics did not differ between packages; however, a non-significant variation occurred during storage (Table 3), different from what was reported by L. O. Silva et al. (2023), who observed a reduction of phenolic compounds in wheat flour mixed with *bocaiuva* during storage for 120 days. Silva et al. (2018) evaluated the compound retention in *bocaiuva* jelly with passion fruit, obtaining 47.72 mg gallic acid equivalent 100 g^{-1}, nearly twice what were found at time 0, possibly for the added passion fruit pulp.

Phenolic compounds have biological effects and therapeutic applications for their antioxidant properties of eliminating free radicals, besides stimulating the activity of antioxidant enzymes, that can help prevent chronic disorders related to oxidative stress, such as chronic non-transmissible diseases (Cosme et al., 2020).

The ascorbic acid content was different between packages (Table 3). There was also a statistical difference over storage time, from 6.68 mg 100 g^{-1} at 0 days to 4.24 mg 100 g^{-1} at 120 days, a retention of 63%. Silva et al. (2018), when evaluating the fresh pulp of *bocaiuva*, found a value of 57.35 mg 100 g^{-1} of ascorbic acid.

Garnes et al. (2022) also reported a decreased trend of diminished ascorbic acid during the storage of dehydrated *bocaiuva* pulp. Such a reduction in the candy vs. the *bocaiuva* pulp is due to its low proportion, pH, and high processing temperature since ascorbic acid degrades at acid pH and temperatures above 40 °C (Herbig & Renard, 2017).

The detected significant interactions revealed that ascorbic acid contents in PE/transparent PET packages had lower means than PE/metallized PET in all evaluated storage times, indicating a higher retention (67%) of ascorbic acid in the package with blockage of light vs. the transparent. However, only 30, 90, and 120 days of storage differed (Table 4).

Table 4. Evaluation of the significant interactions between packages × time for ascorbic acid content in *bocaiuva* mass candy stored in different packages.

Treatment	Time (days)				
	0	30	60	90	120
Ascorbic acid					
PE/transparent PET	6.43aA	4.05bB	3.67bA	3.65bB	3.49bB
PE/metallized PET	6.93aA	6.68aA	4.45bA	5.53abA	5.00bA
CV (%)					

Means followed by the same lowercase letter in the line and capital letter in the column do not differ by the Tukey test ($P < 0.05$); CV: coefficient of variance; Calculation: sample with 32.77% (wet base) of moisture.

Ascorbic acid presents antioxidant and anticancer activity; it acts through various mechanisms, such as eliminating reactive species of oxygen and epigenetic regulators of the expression of factors inducible by hypoxia in tumoral cells (Reang et al., 2021). However, it is not synthesized by mammals, making it necessary to obtain it from food sources, especially fresh fruits and vegetables (Barretta et al., 2020).

The antioxidant activity of the *bocaiuva* mass candy significantly differed between packages and, during storage, presented a reduced IC50 (Table 3). Damiani et al. (2011) evaluated the antioxidant capacity of the candy mass with different proportions of mango peel, observing initial values of IC50 of 1,348.27 and 1,907.66 µg mL^{-1} in alcoholic and ethanolic extracts, respectively, higher than the present study.

A significant interaction occurred between the factors treatment vs. time, with the best result of antioxidant activity for the PE/metallized PET package; however, only at 30 and 120 days did it differ significantly (Table 5). For the value of IC50, the lower the result, the higher will be the antioxidant capacity since less extract is needed to decrease by 50% the initial mass of DPPH. Reducing the carotenoids and ascorbic acid content can explain the reduced antioxidant activity during storage.

Antioxidant substances play an essential role in preventing diseases related to the accumulation of free radicals and are known for minimizing oxidative stress (Attia et al., 2020). Fruits and vegetables are sources of natural antioxidant compounds, such as carotenoids and phenolics (Jideani et al., 2021), that help protect the organism by acting against pathological processes mediated by oxidative stress (Shahidi & Zhong, 2015).

3.3 Microbiological stability

No detectable growth occurred for molds and yeasts, *Salmonella*, or enterobacteria at the beginning and end of storage (0 and 120 days). That suggests the applied processing followed good practices, and the conservation method was effective. Characterizing the product concerning quality control parameters aims to meet the established legal standards (Sousa et al., 2020) and allows the evaluation of its microbiological quality.

3.4 Sensorial analysis

The scores attributed by testers in sensorial analyses did not differ between mass candies just prepared (time 0 days) and those stored for 120 days (Table 6), indicating that product acceptance remained stable even after storage. All attributes

Table 5. Evaluation of significant interactions between packages and time for antioxidant activity of *bocaiuva* mass candy stored in different packages.

Treatment	Time (days)				
	0	30	60	90	120
Antioxidant activity					
PE/transparent PET	909.91cA	1341.3aA	1026.7bcA	1275.7abA	1193.0abcA
PE/metallized PET	682.52cA	823.82abcB	77,77cA	1086.4aA	883.45abcB
CV (%)					

Means followed by the same lowercase letter in the line and capital letter in the column do not differ by the Tukey test ($P < 0.05$); CV: coefficient of variance; Calculation: sample with 32.77% (wet base) of moisture.

Table 6. Scores attributed by testers for the sensorial acceptance, purchase intention, and acceptability index of *bocaiuva* mass candy.

Attributes	*Bocaiuva* mass candy			
	Time 0 days	IA (%)	Time 120 days	IA (%)
Appearance	6.21a	88.86	6.28a	89.76
Color	6.48a	92.79	6.45a	92.14
Texture	6.11a	87.55	6.23a	89.04
Aroma	5.48a	78.51	5.78a	96.38
Taste	6.28a	89.65	6.25a	89.28
Overall aspect	6.28a	81.81	6.32a	90.23
Purchase intention	4.14a		4.13a	

Means followed by the same lowercase letter in the line do not differ by the Tukey test ($p < 0.05$). Scores: 7: I liked it very much; 6: I liked it moderately; 5: I liked it moderately; 4: I did not like it nor liked it; 3: I disliked it slightly; 2: I disliked it moderately; 1: I disliked it very much.

evaluated received scores above 6 (I liked it moderately), except the attribute aroma, which obtained a mean of 5 (I liked it slightly) in both sensorial analyses.

Silva et al. (2018) evaluated the sensorial acceptance and purchase intention of *bocaiuva* jellies with passion fruit and obtained a mean of 6 (I liked it moderately) for the overall aspect and taste and a mean of 4.17 for the purchase intention. Rodrigues et al. (2018) obtained acceptance above 5 (good) for the parameters texture, taste, appearance, and aroma in *alfajores* made with 6% *bocaiuva* flour. Elaborating products with *bocaiuva* has a potential market and good acceptance by testers.

The purchase intention of *bocaiuva* mass candy at 0 and 120 days obtained a mean above 4 (probably would buy) without significant difference between times (Table 6). All evaluated attributes showed an AI higher than 75% (Table 6). According to Dutcosky (2013), products with an AI above 70% are considered suitable for commercialization.

4 CONCLUSION

The *bocaiuva* mass candy keeps stable for physicochemical, microbiological, and sensorial parameters over 120 days of storage and presents good retention of nutrients, besides high acceptability by testers. The metallized terephthalate polyethene package was the most efficient in conserving the evaluated parameters for best retaining bioactive substances, standing out the total carotenoids and ascorbic acid contents.

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