

# Whiskey Caiçara and Cataia: Brief Overview of Production, Consumption and Sensory Analysis

Adilson Anacleto<sup>1</sup>, Ellen Caroline Lima Santos<sup>2</sup>, Ana Paula Machado<sup>3</sup>

<sup>1</sup>Administration Department, Professor from the Interdisciplinary Postgraduate Program - Society and Development – PPGSeD, Professor from Postgraduate Program in Coastal and Insular Environments - PALI. State University of Paraná, Paranaguá Campus, Paraná, Brazil. e-mail: adilson.anacleto@unespar.edu.br  
(Corresponding author)

<sup>2</sup>Administration Department, Scientific Initiation Researcher, State University of Paraná, Paranaguá, Paraná, Brazil

<sup>3</sup>Administration Department, Strategic Business Management Specialist, State University of Paraná, Paranaguá, Paraná, Brazil.

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## Abstract:

**Background:** The aged and cataia flavored handmade sugar cane brandy (*pseudocaryophyllus* pepper), known as Whiskey caiçara is an old practice in traditional communities, and over the years, the drink has become popular especially in the tourist environment and in the face of demand by tourists, local residents have seen in cataia the possibility of earning income, however little is known about consumer preference in relation to this drink. Given this context, this study aimed to carry out a sensory analysis in order to obtain detailed information about the opinions and attitudes of consumers, generating information for producers in order to improve the quality of production and evaluate its market possibility in larger scale production.

**Materials and Methods:** The samples in blind test were evaluated by groups of 30 individuals in four repetitions, and the homogeneity of variances was verified by the Bartlett test and the comparison of the averages of the scores attributed in the sensorial analysis was carried out by the Tukey test, at the level of 0.05 of probability.

**Results:** The handmade brandy sugar cane flavored with cataia in the dosage of four g L<sup>-1</sup> of dry leaves, received higher scores from the judges than other leading brands in the artisan brandy segment, in terms of appearance, color, smell and flavor.

**Conclusion:** It was concluded that the handmade brandy sugar cane flavored with cataia as well as receiving similar note to the market leading whiskey, which confirms the popular knowledge that brandy flavored with cataia has a taste similar to that drink and that is why it is called "whisky caiçara".

**Key Word:** Sugar Cane; Cachaça; Littoral of Paraná; Alembic; Distilled Drinks.

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## I. Introduction

Cachaça is the typical and exclusive denomination of the sugar cane brandy produced in Brazil, it receives several denominations, thus varying according to the region of the country (Cardello, 1998; Viana et al., 2020), this drink has created great prominence as a growing product in the economy due to its acceptance in the national and international market (Brasil, 2009; Zacaroni et al., 2011).

Currently, the production of brandy is an activity developed in all Brazilian regions, benefiting from the great productive adaptation of sugarcane, incorporating into its culture the production tradition and different flavors, according to Anacleto et al. (2017) the Brazilian production of brandy is on average 1.7 billion liters per year and currently generates a turnover of US\$ 600 million, employing more than 500 thousand people directly and providing a collection of approximately R\$ 76.5 million in taxes each year.

The manufacture of the drink in a simplified way begins after the cut, when the stalks are ground to extract the stock, which is then filtered to eliminate impurities. After this phase comes the fermentation period when the sugar content is adjusted in a type of cane wine with a low ethanol content, this liquid is then distilled by transferring the liquid state, which when heated evaporates, becoming gaseous and then, condensing into droplets and returning to the liquid state as brandy ready for consumption, resulting in three different drinks: syrup, head and heart classified as the best quality (Feijó; Maciel, 2004; Masson et al., 2007; Anacleto et al., 2017). The steps in the process of preparing distilled beverages are decisive and influence the development of aromas and subsequently influence the flavor, for this reason in Brazil, it is not uncommon for brandy to age so

that the chemical reactions occur at a concentration of alcohol content be smaller, making the product sensorially better and more palatable to the consumer (Cardello et al., 1998; Guaglianoni; Faria, 2011).

The brandy according to Anacleto et al. (2017) currently meets high quality parameters in terms of its production, thus starting to compete side by side with other highly appreciated distillates in the world, including whiskey. Brazil produces artisanal brandy, which has a different production method than the industrial one, from sugar cane cultivation to the final process with natural fermentation, distilled in small stills and rested for at least three months or more for aging. The artisan drink tends to have a differentiated market, despite the lower production, they have varieties of flavors, colors and that have several variations in terms of their final flavor, and traditionally have higher quality than the industrial drink, therefore, it obtains greater value in the market.

The State of Paraná is responsible for only 4% of the volume produced in Brazil (Schoeninger et al., 2014), however the drink from Paraná has gained prominence in recent decades (Meira, 2013), and the evolution in quality observed occurs especially in handcrafted beverages and is the result of investments and empirical research carried out by producers who master the production process based on knowledge of the family heritage that, according to Sannomiya (2020), occurs since the Brazilian colonial period.

The main factor in the recognition of the drink from Paraná, in addition to the production process, also comes from the aging and flavoring processes that gives the regional drink an unique peculiar characteristics and appreciated by tasters, the brandy aged and flavored with the use of cataia leaves (pseudocaryophyllus pepper) has had great relevance, and the flavor resulting from this aging process is so pleasant to consume that consumers of this drink call it “caičara whiskey”.

Pseudocaryophyllus pepper, belongs to the Myrtaceae family and is known by the common name of cataia, it is an endemic plant of the South and Southeast regions of Brazil, it is an aromatic plant, and on the coast of Paraná it is more easily found in the Superagui National Park in the municipality of Guaraqueçaba, and the leaves are used as a base for aging the brandy for decades (D'angelis; Negrelle, 2014).

The brandy aged with cataia is an old practice in traditional communities, over the years, the drink became popular especially in the tourist environment and in view of the demand by tourists, local residents saw in cataia the possibility of obtaining income. Anacleto et al. (2017) describes that little is known about the real commercial and production potential of brandy flavored with cataia, making it necessary to carry out more accurate studies that can highlight the potential commercial factors that can guide the expansion of production and trade as a way to promote regional development. Also according to the authors, sensory analysis can introduce a way in which typical products from the Coast of Paraná can present generalized improvements in their quality, in a way that meets the expectations of consumers, expanding their consumption by meeting the desires and needs of consumers.

Despite the tradition and importance of this drink in the regional context, the production chain of artisanal brandy lacks systematized information on production and trade. Thus, considering the socioeconomic and historical importance of the use of cataia for the coast of Paraná, as well as aiming to support a better understanding of the current scenario, this work proposes to organize a brief overview of production and trade in addition to using the experimental technique of sensory analysis to obtain detailed information about the opinions and attitudes of consumers in relation to the taste, aroma and color of brandy flavored with cataia (caičara whiskey), evaluating acceptance or rejection when compared to other leading beverages in the regional market.

## **II. Material And Methods**

An exploratory-descriptive research was carried out, which can be characterized as a field experiment that took place between April and September 2022. The process of organizing the sensory evaluation was in accordance with that proposed by Jeronimo et al. (2004), Anacleto et al. (2011) and Anacleto et al. (2013).

Initially, in order to define the drinks to be used in the experiment, a survey was carried out with three retailers of drinks in the region, who reported the competing drinks in consumption by the preference of the final consumer and also by the price range sold in the region of the coast of Paraná, the following samples were defined as:

Sample 1: denominated in the present study as “BR Leader”, it is the brand of artisanal brandy produced in the region of Salinas – MG, classified by retailers as the leading brand of sales in Brazil in the artisanal segment.

Sample 2: denominated in the present study as “Paraná Leader”, it is the brand of brandy produced in Morretes on the coast of Paraná, classified by retailers as the leading sales brand in the coastal region in the artisanal segment.

Sample 3: denominated in the present study as “Whisky”, it is the brand of whiskey produced in the region of Rezende, Rio de Janeiro, classified by retailers as the leading brand of whiskey in sales in the coastal region, in the same price range in which the commercialization of the other beverages used in the present experiment.

Sample 4: called “Cataia” in the present study, it is the same drink described for sample 2 of this study, having undergone the process of compound brandy, that is, it underwent a flavoring process with the cataia leaves acquired from the group of women producers on the island of Superagui, on the coast of Paraná, a traditional region for the sale of the plant's leaves. The beverage flavoring process was adopted as described by Zem et al. (2017) using four g L-1 of dry leaves of pseu-docaryophyllus pepper (Gomes) Landrum for 120 days inserted in the bottle of sample number 4 only.

Sensory evaluations were carried out through invitations to judges who acted voluntarily, due to accessibility, the exclusion criteria being a minimum age of 18 years or older. The tasting and attribution of scores by the judges were carried out in restaurants, supermarkets and wineries, with all samples collected by the same team on the same day.

After acceptance of the invitation by the judges as proposed by Xavier et al. (2013) they received all the information about how they should participate in the test giving their agreement, after the judges filled out a socioeconomic questionnaire, and also referring to pre-consumption factors that could influence the purchase of the drink in their daily lives. In this phase, data was collected in relation to income according to the Brazil criteria (ABEP, 2022) gender, age, marital status, purchase frequency and average consumption.

The second phase of the research took place with the collection of data related to the sensorial analysis by the organoleptic characteristics, when the appearance, aroma, color and flavor of the brandies were evaluated by the judges. In each tasting, the tasters attributed scores between 0 and 10, where 0 = extremely disliked and 9 = extremely liked.

The drinks tested were served in small 5 ml glasses, accompanied by a glass of water and a piece of bread in order to cleanse the palate between tasting the samples, with each judge having the sequence of the samples reversed.

The packages of the evaluated beverages did not have any type of identification that could influence the decision of the judge's score, thus the blind test was characterized.

As proposed by Cardello et al. (1998) and Anacleto et al. (2013), the homogeneity of variances was determined by Bartlett's test, and Tukey's test at the 0.05 level of probability was used to compare the average scores assigned in the sensory evaluation.

### III. Results and discussion

Sampling for the analysis of brandies was carried out by individuals aged between 21 and 66 years, the majority of volunteers were men (63.33%) and the average annual consumption verified was 14.8 liters per year per family, slightly above the 11.5 liters already reported in the literature (FGV, 2018).

With regard to education, color or marital status, no differences were observed in the consumption of brandy for these questions, however it was possible to observe that the highest average of high consumption was obtained in the age groups between 50 years and 69 years, consuming about of 16.40 liters per year, the likely explanation for consumption is that in older age groups, alcohol consumption in general increases (IBGE, 2019). The study carried out does not demonstrate any difference regarding the consumption of drink between the evaluated economic classes (A to E), however it showed that the prices to purchase brandy in classes A and B do not interfere in their purchase decision (20%), but the other classes (n=80%) as the price rises, there is a tendency to replace the consumer brand.

The study revealed that in the experiment carried out, brandy flavored with cataia in terms of appearance and color, in the visual observation among the judges, it did not constitute a depreciatory or qualitative factor when compared to other evaluated beverages (Table 1). Thus, given that there were no statistically significant differences between the brandy flavored as cataia when compared to the other beverages used in the sensory experiment, it can then be considered that the consumer weighs the possibility through experimentation.

**Table 1:** Appearance and color evaluation of cataia flavored brandy compared to leading consumer brands on the coast of Paraná

Sample	Appearance	Coloring
Brazil Brand Brandy Leader	6,95 <sup>a</sup>	6,96 <sup>a</sup>
Coast of Paraná's brandy leader brand	6,90 <sup>a</sup>	6,96 <sup>a</sup>
Whiskey leading brand on the coast of Paraná	7,10 <sup>a</sup>	7,06 <sup>a</sup>
Brandy flavored with Cataia brand leader on the coast of Paraná	7,10 <sup>a</sup>	7,03 <sup>a</sup>

Averages followed by the same letter do not differ statistically from each other (Tukey  $p < 0.5$ ).

The organoleptic characteristics are described by Xavier et al. (2013) as the first stage of brandy consumption, it is in this phase that, according to the authors, the consumer, based on his previous consumption experiences, decides whether he accepts to advance to the other stages, and whether or not he promotes the experimentation of the drink, in this matter the appearance of the product can be classified as the first barrier to be overcome in the process of consumption and acceptance of a new product, as is the case of brandy flavored with cataia.

Kotler and Keller (2006) describe that there are factors that can facilitate the success of a product in a broader market, and brandy has both characteristics. The first comes from the fact that all judges attested that in fact the cataia brandy tastes similar to whiskey, this situation is associated with the name “caičara whiskey”, which works as a great attraction and permeates people’s imagination about what in fact is this drink, associating it with the culture and identity of the coast of Paraná and the secular tradition of the caičaras in Brazil.

The name “caičara whiskey” may be working as a factor in the awakening of the desire for consumption, still according to Kotler and Keller (2006) people consume by necessity from biology, and also by desires, which are understood as the will of certain specific satisfactions or needs; being constantly influenced by the environment where the consumer is inserted, this fact linked to the possible financial capacity of the acquisition is what generates the impulse and disposition that finally becomes the ability to buy in order to satisfy the desire. Thus, given that the name of the drink is presented as an inducer of desire combined with the historical context, once the drink has the desired quality, experimentation takes place, and if the needs and desires of the consumer are met, the commercial capacity of the drink can be realized.

A new product naturally presents difficulties in insertion and maintenance in the market, specifically the Brazilian brandy market which is very competitive, so it is relevant that the new product presents characteristics desired by the consumer, specifically with regard to brandy flavored with cataia in terms of the average scores attributed by the judges (Table 2) were superior to the leading brand in Brazil and the leading brand in Paraná for aroma and flavor, which demonstrates a strong capacity for insertion in the market.

**Table 2:** Evaluation of the aroma and flavor of brandy flavored with cataia compared to leading consumer brands on the coast of Paraná

Sample	Aroma	Flavor
Sample 1 Brazil Brand Brandy Leader	6,63 <sup>a</sup>	6,53 <sup>a</sup>
Sample 2 Coast of Paraná’s brandy leader brand	6,13 <sup>a</sup>	6,16 <sup>a</sup>
Sample 3 Whiskey leading brand on the coast of Paraná	7,23 <sup>b</sup>	7,53 <sup>b</sup>
Sample 4 Brandy flavored with Cataia brand leader on the coast of Paraná	7,90 <sup>b</sup>	7,63 <sup>b</sup>

Averages followed by the same letter do not differ statistically from each other (Tukey  $p < 0.5$ ).

The high scores received from the evaluators can be considered as a quality attribute, according to Garvin (2008) the quality of a product that is not yet in the industrial process and undergoes many variations by the artisanal process can be classified as being a product of “transcendental focus”, in this type of product, the quality improvement process is born in the communities where it is exploited, despite not having scientific or technical proof, quality is synonymous with those who have the habit of consumption, it is absolute and recognizable. However, in these cases quality could not be precisely defined, as it is a simple and non-analyzable property transmitted in these places verbally and regional customs recognized only through experience. Thus, the quality of cataia flavored brandy could only be known after extensive application of it, showing its real characteristics over time to many users, that is, the quality is best expressed by the product itself and its history. It is implicit in this focus that high quality, or native excellence, is a permanent attribute of a good and that it does not depend on changes in tastes or styles, in this context quality transcends that associated with a traditional brand recognized by most users and specialists as having higher quality.

The flavoring of brandy with cataia, according to the assessment, allowed for superior quality, so given the extent of the brandy market, this vision of differentiated quality is therefore close to concepts of market segmentation, based on an adequate balance between the price that does not differ of other competing beverages and the quality offered by the product, and marginal utility, which represents the maximum that the consumer is willing to pay for a product and its quality. Assuming then that the consumer would choose the product based on the combination of price and quality and not just on an isolated comparison of quality or price in relation to other beverages.

Despite the described triad related to price, quality and marginal utility, Anacleto et al. (2017) describes that the commercial strategy model of brandy producers, especially flavored drinks, can be classified according to Porter (1980) as a focus strategy (focus) that is the one that targets the consumer who has less sensitivity to

price, and greater added value to the product, this commercial model gives the producer profits well above average, but this strategy requires actions in the sense of maintaining its competitiveness in the market through marketing, a situation not observed in the case of cataia whose main form of marketing is called viral, or commonly known as word of mouth.

This strategic typology could be applied to cataia commercialization processes, however there are factors to be considered. The first is that according to Anacleto et al. (2017) cataia leaves used in flavoring originate from extractivism, and as this strategic typology predicts lower production and higher added price, there could be a reduction in extractivism levels until agronomic crops of the species are established in the region, expanding the sustainability of the species, so the lower production would generate less extractivism of the plant and would not jeopardize the natural stocks of the species. On the other hand, this strategic typology, due to people's lower sensitivity to the price issue, requires greater investment capacity, in the quality of the flavored drink and also in the packaging offered, a situation that is contrary to what was described by D'Angelis and Negrelle, (2014) who reports that the families that survive from cataia extraction mostly live in social vulnerability, with few options for income generation and therefore end up practicing extractivism by selling the leaf instead of offering the transformed product.

Another issue that deserves careful analysis with regard to the use of cataia, and which, according to the interviewed retailers, in the tourist trade on the coast of Paraná, it is possible to find dozens of drinks flavored with cataia, often with excess leaves, with little time of aging or still with a small amount of leaves, which may not confer the characteristics appreciated in the drink, this offer on the market, in its majority comes from people residing in the urban area who buy the brandy in larger quantities and flavor it with the cataia leaves and sell it not uncommonly, in addition to the labels not having information about the drink itself, according to the legislation, they still end up referring to the traditional communities, the caiçaras and the Island of Superagui on these labels, in an explicit process of cultural appropriation of the drink to the detriment of the traditional communities on the coast of Paraná that hold traditional knowledge are isolated from the benefits of income generation that the practice of flavoring produces. The caiçara communities on the coast of Paraná are the holders of knowledge about the use of cataia, but as reported by Anacleto et al. (2017) for the most part live on the margin of the profits measured by this drink. Thus they suffer because they do not have access to the necessary production infrastructure, they do not have enough human capital and generally a weak bargaining power, and for not having these conditions they end up living without the benefits of their culture in terms of the use of cataia.

Brandy flavored with cataia can be classified as an embryonic market, and little is known about production systems, different forms of flavoring, legalization of products for sale, as well as little is known about issues related to sales and what the assumptions conditioning factors in satisfying the desires of consumers, trade can be expanded, but actions to promote legal production and, in particular, consumption should be considered. The organization for the production and direction of consumption apparently is a relevant path that in the future could generate social impacts on groups of this type of dependent trade. Oliveira et al. (2020) clarify that the production of brandy in the region is an artisanal product and has survived the changes in contemporary society, without losing its characteristics and cultural traits and has gained international recognition, however the lack of institutional support for small traditional producers, have promoted problems of continuity and reproduction of their knowledge.

The scenario described in relation to the levels at which the market for this product is found be altered in a planned way and that considers the communities that have knowledge of this product, so it is urgent to emphasize that these families may be even more vulnerable in the event of the installation of a new competitor, which offers similar products flavored with cataia. The regional organization of these producers could come from the public power, given that apparently the producing communities are not capable of self-organizing as also reported by Anacleto et al. (2017) the processes of improving the quality of expanding commercialization and recognition of Indication of Origin could result in ensuring the maintenance of traditional knowledge in the region of origin.

#### **IV. Conclusion**

The trade and production of brandy aged with cataia is a good alternative for generating income for the caiçara communities on the coast of Paraná, given that its production is low cost and simple, and that it enables trade throughout the year, however, the implications that the practice of extractivism can have on the natural stocks of the plant species should be considered if the activity develops, so in a preventive way, it is urgent that new research be established on the viability of agronomic cultivation of the species.

The study found that in the tourist trade, most brandies flavored with cataia come from urban producers with little or no relationship with traditional communities, making it possible to perceive a process of cultural appropriation of the secular knowledge of these caiçara communities without them receiving anything in return.

The brandy flavored with cataia in a dosage of four g L-1 of dry leaves received higher scores from the judges than other leading brands in the market in the artisanal brandy segment in terms of appearance, color, smell and flavor, as well as receiving a similar score to the leading whiskey market, which confirms the popular knowledge that the brandy flavored with cataia has a similar flavor to that drink and is therefore called “caíçara whiskey”.

New research on the organizational capacity of the communities producing cachaça brandy can generate information so that actions to strengthen the production chain can take place, as well as new studies on the marketing mix as an attraction in the gastronomic tourism route on the coast of Paraná can generate information relevant to the sector.

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