New smells and flavors of Venezuelan cocoa (*Theobroma cacao* L.)

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Abstract

The sensory evaluation of cocoa has become increasingly important, both at the research and production level. With a trained tasting panel, a series of cocoa liquors, from different origins in the main cocoa-producing areas of Venezuela, have been evaluated. The objective of this research was to update the wheels of flavors and aromas of Venezuelan cocoa by including new types of cocoa and other producing areas from the first edition of these wheels in 2013. The cocoa samples that participated in the research, They come from different producers from all over the country, they underwent the following stages: selection, reception, coding, physical analysis of the grains, elaboration of the liquor and tasting. Thanks to the palatability of Venezuelan cocoa, the panelists identified typical venezuelan cocoa descriptors, which allowed the development of a new wheel of odors and flavors by profiles. The new scents are; leather, medicines, wild flowers, forest, herbal, tobacco, cloves, wine, guava, coconut, cherries, banana, fermented fruits, perfume and alcohol. While the new flavors are; caramel, banana, ripe plantain, plums, panela, dry wood, nuts, tangerine, apple and cinnamon. With these additional descriptors, the diversity of odors and Venezuelan cocoa is expanded, which allows discriminating cocoa by type and quality, being the new areas evaluated, Trincheras, Canoabo, Patanemo in the Carabobo state, Delta Amacuro and La Azulita and La Tendida, in the state of Mérida and Táchira, respectively.

Introduction

Cocoa flavor is the basis of cocoa and chocolate products. The intensity and interaction of the flavor components determine the sensory profiles of the different origins and varieties of cocoa (Cros, 2004; Sukha and Butler, 2006). It has been achieved that the fermentation and drying of cocoa influence the sensory profile of cocoa, which varies depending on the genetics of the plant, as well as the genotype-environment interaction (Loor, 2002; Ribas *et al.*, 2014).

In the sensory analysis of cocoa, different points of view have been achieved, due to the complexity of the matrix. With regard to sensory analyses, several studies lacked information on the training performed and the performance of the panelists. Moreover, a discrepancy was noted in the descriptive vocabulary of flavors used.

In order to describe and measure some of the relevant physical and sensory characteristics of cocoa, tasting panels have been created and trained that can determine its attributes and defects through its liquors, as a quality control tool at the end of the day. of the product transformation process (Fadel *et al.*, 2006).

Material and methods

Obtaining of samples

The samples are selected considering the trajectory of the different production units or official organizations associated with cocoa throughout the country.

Figure 1. Map of Venezuela by states, indicating the cocoa-producing areas.

Tasting room and sensory analysis.

The sensory analysis room was installed in accordance with the requirements of ISO:8589 (ISO, 1988).

The liquors were prepared in the San Juan de Lagunillas Experimental Field of INIA - Mérida and the Industrial and Agricultural Chemical Analysis Research Laboratory (LIAQIA), of the University of Los Andes, in Mérida-Venezuela. According to the method proposed by Clapperton *et al.* (1994) and Sukha *et al.* (2008). Using 150 different liquors during training and analyzing one sample at a time.

The sensory analysis of cocoa liquors was carried out using a panel of tasters selected and carried out for said evaluation. The formation of the panel of tasters was carried out in three basic stages (Torricella Morales and Huerta Espinoza, 2008; NTPISO, 2008 and Sukha et al., 2008), following the next steps:

✓ **Recruitment**
✓ **Selection and evaluations**
✓ **Training**

Stages

✓ Personal interview to the candidates
✓ Evaluation of the detection thresholds of basic flavors, sensations of astringency and spiciness, and specific flavors and aromas.
✓ Anosmia test.
✓ Determination of difference thresholds.
✓ Detection of secondary flavors.
✓ Establish the specificity by type, area and qualities of cocoa.

Results

Currently, the panel works with the methodology of the Cocoa of Excellence Programme (Glossary of terms for cocoa bean flavour evaluation as liquor, 2021).

Improve the wheel of aromas and flavors

It was achieved with the tasting panel, a reproducibility in all the characteristics analyzed. The panelists identified descriptors in samples of Venezuelan cocoa liquors, which allowed the development of the wheel of smells and flavors.

It was also possible to differentiate and identify poorly fermented, well fermented, properly roasted, overroasted, raw, smoked cocoa, among others.
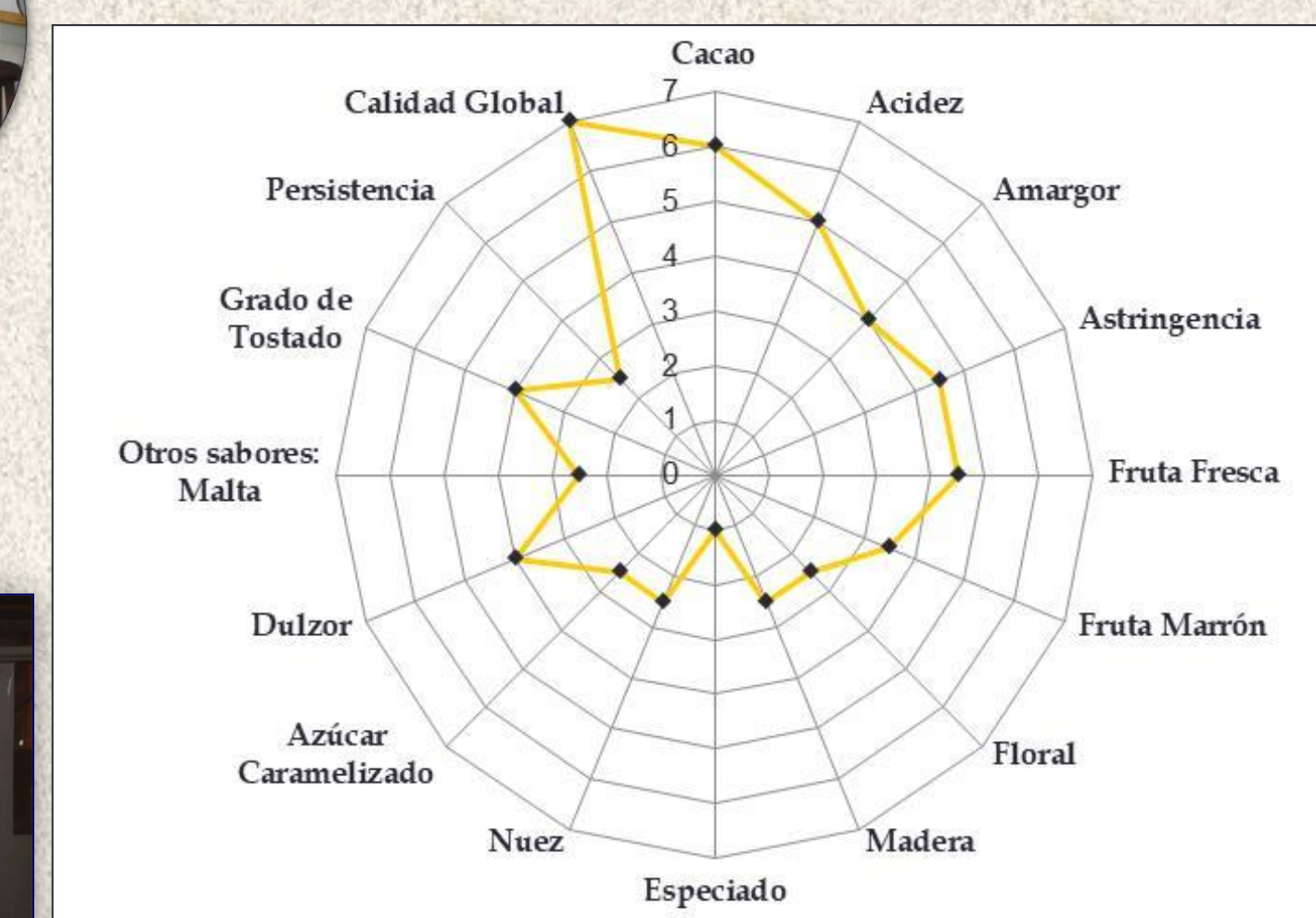
Conclusions

➢ With the descriptors identified in this study, the smell and flavor classification wheel for Venezuelan cocoa was improved, which will allow us to discriminate our cocoas by type and quality to finally establish their prototypes.

➢ Odors of nuts, almonds, wood, green beans, liquor, medicines, yogurt, fresh grass, caramel, cane juice, brown sugar, malt, orange blossoms, cinnamon, chocolate, and flavors such as oil, smoke, alcohol, cocoa, Roasted coffee, citrus, chocolate, spicy, floral, nuts, fermented fruits, dairy, peanuts and medicines are typical of Venezuelan cocoas.

➢ Characteristics of cocoas from different cocoa-growing regions of Venezuela and under different postharvest handling conditions were evaluated, managing to differentiate liquors with excellent attributes as well as liquors with defects.

➢ With these results, it is proposed that the classification of cocoa liquors should not only be based on the determination of chemical indices, but also on a sensory evaluation with a properly selected and trained tasting panel.

➢ In this way, Venezuelan producers will be able to have a more objective and precise assessment of their cocoa at the time of marketing, prior to the sensory analysis of their cocoa.

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