TITLE: SENSORY ANALYSIS OF CHOCOLATES PRODUCED FROM DIFFERENT VARIETIES OF COCOA (*Theobroma cacao* L.) INOCULATED WITH *Saccharomyces cerevisiae* CA11

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ABSTRACT:

Theobroma cacao L. is economically important due to its valuable seeds, are the principal raw material for chocolate production. Fermentation is essential for removing the pulp surrounding the beans and for developing precursors of chocolate flavors. A properly conducted fermentation process is a prerequisite for the production of high-quality chocolate. The use of starter culture has been proposed in order to have better control over the fermentation process, and to obtain high-quality chocolate. This study aimed to evaluate the sensorial characteristics of chocolate produced from four different cocoa varieties CCN51, PS1030, FA13, and CEPEC 2004, inoculated with *S. cerevisiae* CA11. Two types of sensory analysis quantity descriptive analysis (QDA) and temporal dominance sensations analysis (TDS) were used. During the first (QDA), the chocolate was characterized according to different attributes of smell and flavor. The sensory attributes were then correlated with fermentation assay by principal component analysis (PCA). The first (PC1) and second (PC2) principal components explain 49.21% and 39.63% (respectively) of the total variance (88.84%). On the negative side of PC1 and the positive side of PC2, the sensory attributes chocolate aroma, hardness, sour aroma, melting, and sweet flavor were correlated with fermentations of the FA13 and CCN51 cocoa varieties. On the positive side of PC1 and PC2, astringent, chocolate flavor, and bitter flavor were correlated with fermentation of the CEPEC2004 variety. The caramel flavor was correlated with fermentation of the PS1030 variety on the positive side of PC1 and the negative side of PC2. According to TDS, all chocolate showed dominance of bitter and cocoa attributes, the CCN51 variety showed significant perception of sweet and sour. Chocolate of the PS1030 variety showed significant perception of sweet and fruity. The FA13 and CEPEC2004 variety fermentations produced chocolate with significant perception of fruity and astringent. Chocolate produced by the PS1030 cocoa variety showed positive sensations during both methods. The chocolate produced with different cocoa varieties exhibited different profiles of volatile compounds and sensorial attributes. These results suggest that the cocoa varieties influenced the chocolate quality; therefore, it would be better to ferment different varieties separately using yeasts as a starter culture for better standardization of the cocoa fermentation process.

Keywords: Cocoa fermentation, Chocolate, Cocoa variety, Temporal dominance of sensations

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