Comparative Study of the Refractive Index and Acidity of Cocoa Butter from Different Varieties

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Abstract : Cocoa butter is an essential ingredient in the production of various food and cosmetic products. Its physicochemical properties, particularly the refractive index and acidity index, play a crucial role in determining the quality and stability of the final products. Cocoa varieties, such as PS1319, BN34, and CCN51, exhibit genetic and agronomic differences that may influence these parameters. This study aims to compare these two indices across three cocoa butter varieties to better understand the varietal influences on cocoa butter properties. The refractive index was measured at 60 °C using a digital refractometer, following the AOCS method, and the acidity index was determined by titration with a 0.1 M NaOH solution after dissolving 2 grams of cocoa butter in an ether-alcohol (2:1) solution and adding two drops of phenolphthalein as an indicator. Statistical analysis was conducted using SAS® OnDemand for Academics software. The results revealed similar refractive index values for the three varieties: PS1319 (1.4482), BN34 (1.4484), and CCN51 (1.4481), indicating a comparable lipid composition among them. On the other hand, the acidity index showed more pronounced differences: PS1319 (0.8759 mg KOH/g), BN34 (0.3381 mg KOH/g), and CCN51 (1.0899 mg KOH/g), although no statistically significant differences were detected at a 5% confidence level. These findings suggest uniformity regarding the refractive index but variability in the acidity index, likely due to minor differences in fatty acid composition among the varieties. These observations provide valuable insights for optimizing the quality of cocoa butter in food and cosmetic applications.

Keywords : BN34, CCN51, physicochemical properties, PS1319, quality