

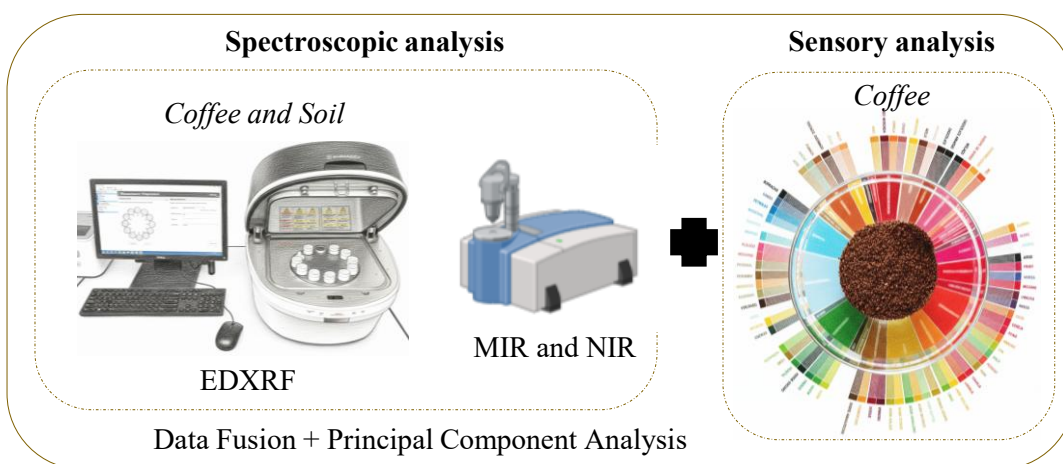
Chemical Characterization of Soils and Coffea arabica Farm Coffees and Their Relationship with Sensory Quality

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Introduction

The quality of coffee is complex and encompasses sensory characteristics inherent to the chemical composition of the beans, which, in turn, is influenced by various factors, such as soil fertility. Thus, understanding the chemical composition of both coffee and soil allows for the establishment of parameters related to beverage quality and crop nutrition. This study aimed to chemically characterize soils and coffees from Coffea arabica farms in different Brazilian regions and assess their contributions to the sensory quality of the beverage.

Materials/Methods



Results/Discussion

EDXRF analysis identified Fe, Al, Ti, Zr, K, Ca, and Si as the main elements distinguishing the soils, while Ca, Mn, and Rb in green coffee, and K, Ni, and Rb in roasted coffee. Infrared spectral data successfully differentiated soils and coffees from different cultivation areas. Characteristic bands of minerals such as kaolinite, gibbsite, quartz, and organic matter were identified in the soil. Compounds such as aliphatic acids, caffeine, pyridine, and lipid oxidation products also had a negative impact, whereas carbonyl compounds and chlorogenic acids were associated with better sensory attributes. In roasted coffee, caffeine, pyridine, fatty acids, and caffeine/trigonelline may have affected balance, whereas organic acids and lipidic compounds positively influenced acidity and overall quality.

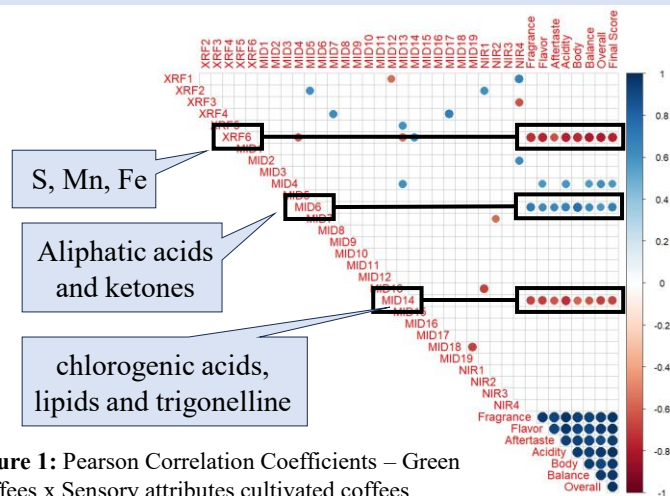


Figure 1: Pearson Correlation Coefficients – Green Coffees x Sensory attributes cultivated coffees

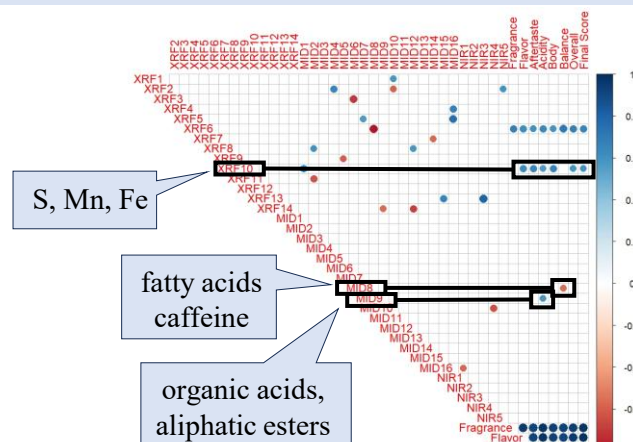


Figure 2: Pearson Correlation Coefficients – Roasted Coffees x Sensory attributes of cultivated coffees

Conclusion/Perspectives

This study demonstrated the potential of spectroscopic techniques for characterizing soils and coffees and relating their compositions to beverage quality.

References:

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