

# Changes in the chemical and sensory profile of *Coffea arabica* prepared by infusion and filtration at different temperatures

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## Introduction

Coffee quality can be described as a set of physical, chemical, and sensory characteristics that satisfy a wide range of consumers. Among other factors, the final quality of the coffee beverage is determined by the proper execution of the extraction process [1]. This study aimed to differentiate and evaluate the chemical and sensory composition of coffee beverages prepared using distinct extraction methods under varying temperature conditions for the *Coffea arabica*[2].

## Materials/Methods

## Sensory Analysis

### Two extraction methods

V60  
16-20 mesh



French Press  
12 mesh



T: 95 °C; 90 °C; 85 °C; 80 °C  
7g of coffee grounds to 100 mL of water

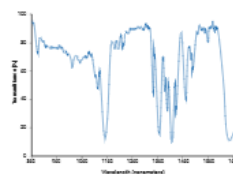
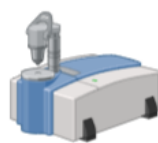


| Flavor      | Aroma       | Acidity     | Bitterness  | Body        |
|-------------|-------------|-------------|-------------|-------------|
| Very weak   | Very weak   | Very weak   | Very weak   | Very weak   |
| Weak        | Weak        | Weak        | Weak        | Weak        |
| Medium      | Medium      | Medium      | Medium      | Medium      |
| Strong      | Strong      | Strong      | Strong      | Strong      |
| Very strong | Very strong | Very strong | Very strong | Very strong |

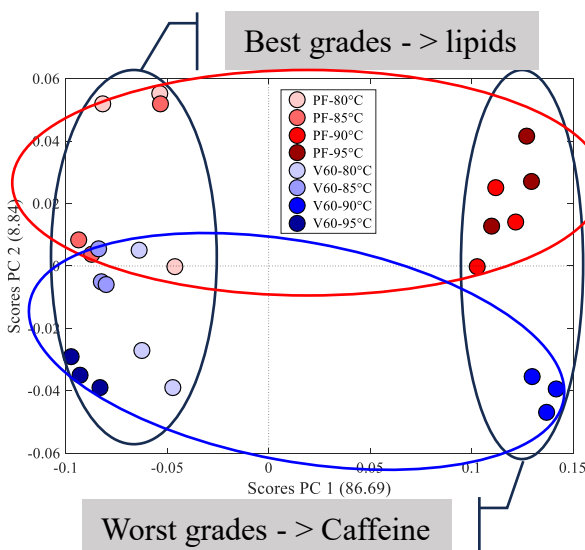
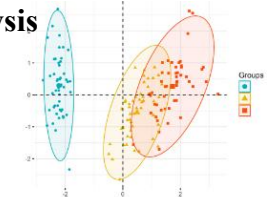
10 cm

- Descriptive methods
- 12 trained tasters

## Infrared analysis



## Principal Components Analysis



## Results/Discussion

The PCA loading plot highlighted relevant absorption bands associated with key chemical compounds. Notably, bands related to chlorogenic acids, trigonelline, and carbohydrates were observed at 80°C and 85°C for the French Press, and at 80°C, 85°C, and 95°C for the V60 method. In the 1700–1600  $\text{cm}^{-1}$  region, absorptions corresponding to chlorogenic acids and proteins were detected, while in the 1500–1400  $\text{cm}^{-1}$  range, significant bands associated with proteins and organic acids were observed, particularly for the French Press at 80°C and 85°C, and the V60 at 80°C, 85°C, and 95°C. For Arabica coffee, the V60 method at 95°C provided the best overall sensory performance, while the French Press at 80°C also yielded favorable results.

## Conclusion/Perspectives

This study concludes that the extraction method, and temperature influence the sensory characteristics of coffee. The ideal extraction temperature is one that balances positive and negative aspects or enhances the positive ones, which is crucial for balanced extraction and desired flavors.

Figure 1: Score plot of principal components for coffee

## References:

1. Corboba, et al. 2020. *Tendências em Ciência e Tecnologia de Alimentos* 96.
2. Hoffman, et al. 2018. *The World Atlas of Coffee: From beans to brewing-coffees explored, explained and enjoyed*, Hachette UK.
3. Salamanca, et al. 2017. *Food Chemistry*, 214.