

Assessment of roasted coffee adulteration with coffee husks by gas chromatography and electronic tongue

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Introduction

Coffee is frequently adulterated for economic gains through the incorporation of low-cost materials in its powder, such as coffee husks (or cascara) [1]. Thus, there is a need to adopt fast and reliable methodologies for the detection of coffee adulterations to ensure coffee quality.

Materials/Methods

Medium roast Colombia Arabica coffee was mixed with coffee husks at different concentrations to evaluate the feasibility of using headspace solid-phase microextraction coupled to gas chromatography/mass spectrometry (HS-SPME/GC-MS) and electronic tongue in the detection of this adulteration.

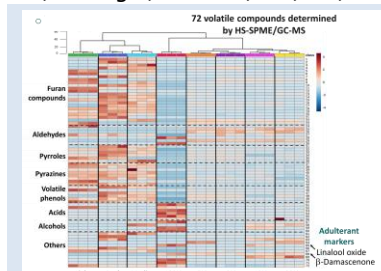


Figure 1: Volatile profile

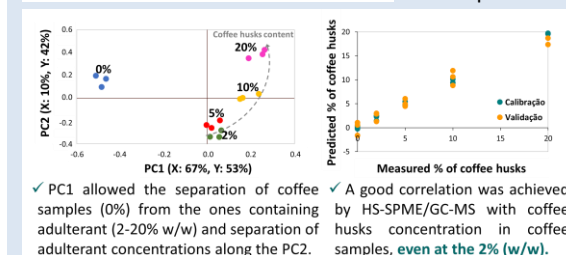


Figure 2: Calibration models for volatile data using PLS regression with leave-one-out validation

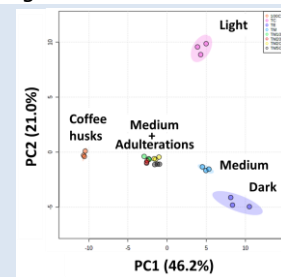


Figure 3: Electronic tongue sample recognition

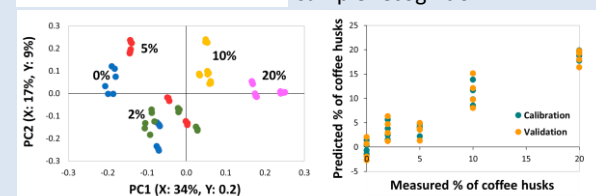


Figure 4: Calibration models for electronic tongue data using PLS regression with leave-one-out validation

Conclusion/Perspectives: This study showed that HS-SPME/GC-MS and electronic tongue can be used as simple and sensitive tools for adulteration detection in coffee brews at industrial level, although a fast screening can be achieved using electronic tongue while HS-SPME/GC-MS allowed the adulterant detection at the lower amount tested.

References:

1. Couto, et al. 2023. Adulteration in roasted coffee: a comprehensive systematic review of analytical detection approaches, *International Journal of Food Properties* 2023, 26, 231–258.

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