

Assessment of different postharvest coffee processes by simultaneous analysis of chemical constituents

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Dry, semi-dry and wet are the main postharvest processes of raw coffee beans employed to convert the freshly harvested fruit into green coffee. The first and third are the most commonly used in all producer countries. The dry process imparts a so-called full body sensation in beverage, while the wet process (usually known as washed coffee) gives full aroma and pleasant acidity beverages.¹ Coffee quality comes from a set of physical, chemical and sensory attributes. The chemical composition of the beans, for instance, is deeply influenced by the type of post-harvest process, leading to differences in the concentration of oil, fatty acids, diterpenes, chlorogenic acid and sugars, among others.^{2,3} The aim of this work was to evaluate the chemical constituents from methanolysed crude Brazilian Arabica coffee oil that could be important in the differentiation of post-harvest processes by using the single analytical technique of GC-FID. Green coffee samples were obtained from Paraná and Rio de Janeiro producers (n=9) and submitted to Soxhlet extraction, and the oil was methanolysed by a microwave assisted procedure.⁴ Samples were then injected in the GC-FID, and analysed under conditions optimized in a previous study from our group using pulsed split injection and a DB-17HT (10 m, 0.25 mm, 0.15 mm) column.⁴ The samples were also injected in an LC-MS to confirm the identity of substances suited to LC analysis. The concentrations of compounds were calculated based on normalized areas referred to the internal standard (*n*-tridecane) for FAMES, diterpenes and sterols, in a single run. For these main classes of compounds, differences (p <0.05) were observed regarding the post-harvest processes. PCA data analysis was able to differentiate the three processes with the two principal components PC1 (70.3%) and PC2 (29.7%), indicating that the major chemical constituent(s) that contributed to process differentiation were diterpenes (cafestol and kahweol) for the dry process; sterols for the semi-dry; and FAMES for the wet. This is the first description of a method capable of evaluating FAMES, diterpenes and sterols simultaneously in raw coffee oil, and which are shown to depend on postharvest processing.

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