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BOOK OF ABSTRACTS

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- A close-up photograph of a coffee branch with several clusters of ripe, red cherries. The cherries are in various stages of ripeness, with some showing a slight white bloom. The background is a soft-focus green, suggesting a coffee plantation.
- Agronomy
 - Chemistry
 - Technology
 - Physiological effects
 - Sustainability, climate changes

Quality comparison of Arabusta and Robusta grown in French Guiana

Abdallah Cécile^{1, 2} (cecile.abdallah@ird.fr), Portaluri Vincent³, Navarini Luciano⁴, Crisafulli Paola⁴, Lonzarich Valentina⁴, Charmetant Pierre^{5, 6}, Thomas Freddy³, Perthuis Bernard^{5, 6}, Etienne Hervé^{2, 7}, Bertrand Benoît^{2, 7}, Leroy Thierry^{5, 6}, Campa Claudine^{1, 2}

¹IRD, UMR DIADE, Montpellier, France ; ²UMR DIADE, Univ Montpellier, IRD, CIRAD, F-34394 Montpellier, France ; ³Eurofins, Nantes, France ; ⁴illycaffè spa., Trieste, Italy ; ⁵CIRAD, UMR AGAP Institut, F-34398 Montpellier, France ; ⁶UMR AGAP Institut, Univ Montpellier, CIRAD, INRAE, Institut Agro, F-34398 Montpellier, France ; ⁷CIRAD, UMR DIADE, Montpellier, France

RATIONALE

Arabusta coffee was created by crossing *Coffea arabica* L. and *C. canephora* Pierre ex-Froehner after doubling the chromosome number of *C. canephora*. For breeding studies and coffee quality improvement, clones have been planted in French Guiana. As green bean metabolite content largely influences the coffee cup quality, biochemical and sensory analyses of Robusta and Arabusta were done on green beans and compared as part of Breedcafs H2020 project.

METHODS

Arabusta cherries were harvested on 6 clones in 4 farms in Apatou and in Combi research station, and those from Robusta in Combi research station. They were wet processed before grinding. Phenolic compounds and alkaloids were quantified by HPLC (Campa et al, 2017), sucrose by enzymatic analysis (Megazyme kit, Ireland), diterpenes by NMR (Portaluri et al, 2020) and VOC by headspace SPME-GC/MS (Marie et al, 2020). Lipids were extracted (Folch et al, 1957) and quantified by cgfb (Bordeaux). Sensory analyses followed the protocol guidelines of the Specialty Coffee Association (SCA) for *C. arabica* (Marie et al, 2020). We used Statistica software for analyses.

RESULTS

Compared to Robusta, Arabusta had a lower caffeine content and higher trigonelline, sucrose and fatty acid contents. Arabusta evidenced both 16-O-methylcafestol and kahweol, known markers for Robusta and Arabica species, respectively. 17 of the 25 non-volatile and 23 of the 47 volatile compounds showed significant differences ($p \leq 0.05$) between Arabusta and Robusta. Except 5-caffeoylquinic and coumaroylquinic, chlorogenic acids accumulated more in Robusta.

A PCA based on volatile compound content separated samples in three groups: Robusta samples, most of the Arabusta from Apatou (richer in pyrazine, toluene, 2-propanone) and those from Combi associated with 3 from Apatou (richer in D-limonene, DMSO, methyl-butanoic acid, and IBMP). A sensory analysis based on 9 sensory parameters indicated that 3 samples received a final score higher than 80. A PCA confirmed that 2 Arabusta samples were particularly different from all the others.

CONCLUSIONS & PERSPECTIVES

With higher contents in sucrose, trigonelline, diterpenes, fatty acids and D-limonene and a lower content in caffeine, the composition of the Arabusta green beans seems significantly different from Robusta. The sensory analysis supports the hypothesis that some Arabusta clones possess the potential to produce quality coffee. However, it is necessary to continue the research to confirm these results.

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