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Profiling of C. canephora genotypes in the Democratic Republic of the Congo

INTRODUCTION

In 2019, Robusta coffee (C. canephora) accounted for 43% of the world coffee supply yet research on this species is trailing behind. A negative quality bias towards Robusta coffee persists in the market, resulting in a reduced interest to explore its quality potential.

Therefore, the genotyping and evaluation of C. *canephora* accessions lags behind.

STUDY AREA

- Yangambi, Tshopo province
- Elevation: 470 m, Af, 25°C avg
 - o Robusta field gene bank (INERA)
 - o Research & breeding since 1941
 - Contains > 100 cultivars
 - Wild collected material (>250)

AIMS

- To evaluate the quality potential of the genotypes present in the Robusta collection.
- To identify chemical markers for genotype discrimination.
- To study the relationship between coffee bean metabolites and quality.

METHODS Genotyping

- Estimated 95 genotypes.
- DNA extraction from mature leaves.
- Genotype-by-sequencing (GBS).

Quality evaluation

- · Natural sun-dried coffee.
- Green grading & sensory evaluation.
- Fine Robusta Standards and Protocol (Coffee Quality Institute).

Untargeted metabolomics

- Green and roasted coffee beans.
- LC-HRMS: LC-ESI-QTOF (Agilent Tech.).
- Semi-quantification and characterization of metabolites using MassHunter® software (Agilent Tech.) and databases.

Data analysis

- Multivariate analysis of metabolite data using Workflow4Metabolomics 4.0.
- Sensory predictive modelling of quality.

PERSPECTIVES

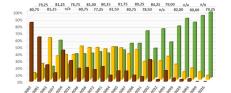
Promising indication of quality potential.

ULB

- Identification of the individual trees present in the collection using GBS.
- Developing a processing method for a high amount of coffee samples.

PRELIMENARY OBSERVATIONS

creen size distribution and Fine Robusta score



■ ≤ 14 screen ■ ≥15 screen ■ ≥17 screen

Screen size distribution of the different C. canephora genotypes sampled during the main harvest of November 2020 – January 2021. Defects were removed before roasting and sensory evaluation. Number on ton of the columns represent the Fine Polystic across pd. score pd. available.



Flavours and aromas found in the different C. canephora genotypes sampled during the main harvest of November 2020 – January 2021. Coffee samples were processed using the Natural method. Defects were removed before roastins and sensory evaluation.

















