

# Coffee selection based on molecular characterization and identification of coffee resistant to *Meloidogyne paranaensis*

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## Introduction

*Meloidogyne paranaensis* is one of the most aggressive and widely widespread nematode species parasites of coffee. The use of resistant cultivars in infested regions contributes to the maintenance of coffee activity.

## Objective

The objective of this work was to characterize the molecular diversity of breeding populations resistant to *Meloidogyne paranaensis*: F<sub>4</sub> progenies of the MG 0185 R2-1 (T1), MG 0179 R1-5 (T2), MG 0179 R1-1(T3), MG 0179 R1-3 (T4).

## Material and Methods

Phenotyping was conducted in controlled conditions. Before inoculation with 1600 eggs of *M. paranaensis* (EST P1), leaves were collected from each plant for DNA extraction. The evaluation was performed 180 days after inoculation by calculating the Reproduction Factor.

The SSR markers were initially analyzed in the genotypes Amphillo Collection 1 (AC1), Amphillo Collection 2 (AC2) and Amphillo Collection 3 (AC3) and in the cultivar Catuaí Vermelho IAC144.

Five polymorphic SSR markers – CaEST 022; CaEST 045; CaEST 072; CaEST 002; CaEST 058 – were applied to investigate genetic diversity in F<sub>4</sub> progenies.

## Results

- T1 and T3 progenies showed genetic resistance segregation to *M. paranaensis* indicating that the resistance is conferred by a single dominant gene (3R: 1S).
- No segregation was observed in T2 and T4 genotypes, being 100% resistant.

- T2 and T4 have low diversity, and T1 and T3 high diversity. The highest diversity was found for T3 progeny.
- Based on the dendrogram, the coffee plants were clustered in four groups. Resistant plants were found in all groups.
- Group 1 contains the coffees genetically closest to the commercial cultivar Catuaí, and four of them are resistant to *M. paranaensis*.
- This result shows that these coffees (7T3, 8T3, 16T3 and 40T3) should be selected for the next generation in the breeding program, as they are resistant to nematode and are genetically close to the commercial cultivar.
- In this sense, 11 plants (3T3, 4T3, 9T3, 10T3, 11T3, 13T3, 17T3, 21T3, 23T3, 25T3 and 31T3), although resistant, are genetically close to the wild parent (Amphillo) and should be avoided in the breeding program.

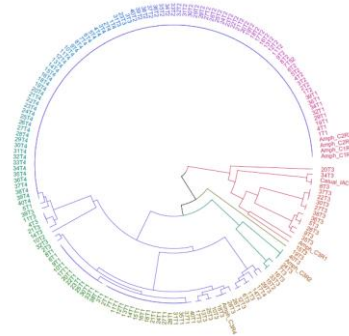


Figure 1. Clustering analyze of plants from F<sub>4</sub> progenies of MG 0185 R2-1 (T1), MG 0179 R1-5 (T2), MG 0179 R1-1(T3), MG 0179 R1-3 (T4) resistant to *M. paranaensis*, cultivar Catuaí Vermelho IAC 144 (CV 144) and parentes Amphillo Col. 1, Amphillo Col. 2 e Amphillo Col. 3.