Survey of *Hemileia vastatrix* races from Peru to identify potential coffee mutants with disease resistance

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RATIONALE: Coffee leaf rust (CLR), caused by *Hemileia vastatrix* (*Hv*) is the main limiting factor of coffee production in Peru. Coffee plantations were renewed with resistant varieties from Timor Hybrid (HDT) derivatives, like Catimors. However, the appearance of new and more virulent *Hv* races has resulted in the gradual loss of resistance of these varieties [1]. Since 2016, the Universidad Nacional Agraria La Molina participates in a research project together with CIFC (Portugal) and other Institutions. This Project, coordinated by the Joint FAO/IAEA aims to produce coffee mutants using gamma-ray irradiation with potential resistance to CLR. Irradiation treatments of 0, 50, 100, and 150 Gy on seeds of *Coffea arabica* L. var. Typica performed in Peru resulted in several mutants [2], which are now being screened for resistance to local *Hv* isolates, collected from the same coffee plants of the rust samples sent to CIFC.

METHODS: A total of 57 rust samples collected on different coffee genotypes from different regions in Peru were sent to CIFC.
The assessment of the virulence spectra of the rust samples was performed on a set of 27 coffee differentials.

RESULTS:

Characterization of rust races (Portugal)

In this survey were found the following rust **races** with the respective (virulent genes):

I (v2,5);
XXIII (v1,2,4,5);
XXIV (v2,4,5);
XXXIV (v2,5,7 or v2,5,7,9)
XXXV (v2,4,5,7 or v2,4,5,7,9)
New rust race not yet designated (v2,4,5,7,8 or v2,4,5,7,8,9)
New rust race not yet designated (v1,2,4,5,7,8 or v1,2,4,5,7,8,9)

CONCLUSIONS & PERSPECTIVES:

In this survey, complex *Hv* races were identified. The Peruvian coffee growers must be aware about the introduction of new resistant varieties without knowing their spectra of resistance. Most lines of the resistant population Catimor (Caturra x HDT 832/1), widespread in the majority of the coffee-growing countries, are susceptible to the two new races, as well as to races XXXIV and XXXV identified in this study.

Screening of CLR resistance in coffee mutantes (Perú)

The new rust races show a very high level of virulence and being used to identify coffee mutants, in irradiated var. Typica, with potential resistance to *Hv*

References:
[1] Talhinhas et al. 2017. Molecular Plant Pathology 18:1039-1051
[2] Quintana et al. 2019. Peruvian Journal of Agronomy 3 (2): 74-80

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