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BOOK OF ABSTRACTS

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

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RATIONALE

Coffee leaf rust (CLR), a disease caused by the fungus *Hemileia vastatrix* (*Hv*), is the main limiting factor of coffee production in Peru. According to Julca *et al.* (2019), crop losses caused by CLR were evaluated in 290 million dollars, leading to the implementation of an emergency plan, with a financial fund of around 30 million dollars, managed by the “Servicio Nacional de Sanidad Agraria”. This situation led to the renewal of coffee plantations 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 (Talhinhas *et al.* 2017, CIFC Records).

Since 2016, the Universidad La Molina participates in a research project together with CIFC (Portugal) and other Institutions from China and Costa Rica. This Project, coordinated by the Joint FAO/IAEA Plant Breeding and Genetics Laboratory, International Atomic Energy Agency, 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 (Quintana *et al.* 2019), 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 from different coffee genotypes and different regions in Peru were sent to CIFC for the assessment of their virulence spectra on a set of 27 coffee differentials.

RESULTS

The virulence spectra of rust samples and their correspondent physiologic races were characterized as follows: races I (v2,5), race XXIII (v1,2,4,5), race XXIV (v2,4,5), race XXXIV (v2,5,7 or v2,5,7,9), race XXXV (v2,4,5,7 or v2,4,5,7,9) and 2 new rust races, not characterized before at CIFC, with the following genotypes of virulence; v2,4,5,7,8 or v2,4,5,7,8,9 and v1,2,4,5,7,8 or v1,2,4,5,7,8,9.

CONCLUSIONS & PERSPECTIVES

Hv race genotypes comprise 9 virulence genes (v1 -v9) and in this survey, complex races from 2 to 7 virulent genes were identified. The Peruvian coffee growers must be aware about the introduction of new resistant varieties without knowing their spectra of resistance. The majority of lines of the resistant population Catimor (Caturra x HDT 832/1), widespread in the vast majority of coffee-growing countries, are susceptible to the 2 new races, as well as to races XXXIV and XXXV identified in this study.

References:

- Quintana *et al.* 2019. Peruvian Journal of Agronomy 3 (2): 74-80.
- Julca *et al.* 2019. Journal of Science and Research 4 (4): 1-9.
- Talhinhas *et al.* 2017. Molecular Plant Pathology 18:1039-1051.