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BOOK OF ABSTRACTS

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Exploring the role of sugars in the Kawisari coffee resistance to *Hemileia vastatrix*

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Rationale:
Coffee leaf rust (CLR), a disease caused by the fungus *Hemileia vastatrix*, compromises the production of Arabica coffee (*Coffea arabica*), a species that accounts for almost 60% of the global coffee supply. Plants exert a tight coordination of carbon metabolism along growth and development either in normal or stressful situations. The control of this metabolism is of special interest in plant-fungus biotrophic interactions such as coffee rust once plants attempt to restrict pathogen access to resources such as sugars and sugar derivatives. RNAseq data from Kawisari leaves (resistance and susceptible samples) showed modulation of carbon metabolism as well as sugar transporters along the infection process. The sugar transporter activity might be correlated with sucrose degradation into glucose and fructose, which can be achieved by invertases enzymes. This work aims to unveil the role of sugar enzymes and sugar transporters in coffee rust resistance.
Methods:
Kawisari hybrid (*C. arabica* x *C. liberica*), a genotype used as a donor for resistance in Arabica breeding programs in India, was inoculated with urediniospores of *H. vastatrix* race II and race XIII to establish an incompatible (Resistance) and compatible (Susceptibility) interaction, respectively. The infection process was monitored by light microscopy, invertases enzymatic activities were evaluated by spectrophotometry and gene expression characterization by RT-qPCR.
Results:
The resistance was characterized by the restriction of fungal growth (more frequently in post-haustorial stages) associated with the hypersensitive response, accumulation of phenolic-like compounds in host cells and, haustoria encasement with callose. A significantly higher percentage of infection sites with host responses were observed in resistance than in susceptible. The highest enzymatic activities were observed for cell wall and vascular invertases at the latter stages of the infection process, particularly for resistance. Expression analysis of monosaccharide transporter genes by RT-qPCR is ongoing.
Conclusions & Perspectives:
Overall, this work will contribute to a better understanding of the role of sugars mobilization in *Coffea* sp. - *H. vastatrix*interactions, particularly in host resistance.