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BOOK OF ABSTRACTS

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Coffee (*Coffea arabica* L.) bean transcriptome and volatiles under stress

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RATIONALE

Stress is one of the major problems induced by coffee leaf rust (CLR), which is caused by *Hemileia vastatrix* Berk. et Br. This study evaluated the effect of CLR control and fruit thinning treatments on the gene expression of immature and mature coffee beans in two CLR susceptible cultivars of *Coffea arabica*.

METHODS

Eight treatments considered the interaction of two CLR susceptible coffee cultivars (*Coffea arabica* L.), two fruit thinning treatments (0% or 50% removal after pollination), and two rust control treatments (with or without cyproconazole and epoxiconazole spray application). Fruit samples were collected in the experimental plot once during the highest infection phase of CLR disease. Mature (red color) and immature (yellowish) fruits were manually collected from each plant. The profiles of volatile compounds from the green beans were identified using the Solid Phase Micro Extraction (SPME), Gas Chromatography-Mass Spectrometry (GC-MS). The total ion count – area under the curve of each peak (relative abundance) for each volatile was reported and used for later statistical analysis. The relative abundance of the volatile precursors obtained was statistically compared between treatments using an analysis of variance (ANOVA) and t test using a cutoff value of $p \leq 0.05$. RNA was isolated using the PureLink® RNA Mini Kit (LifeTechnologies Inc.) according to the manufacturer's protocol.

RESULTS

All differentially expressed genes (DEGs) were grouped into gene ontology (GO). The enriched metabolic pathways related to the DEGs revealed differences between the management practices and the physiology of the plant by genotype. A higher number of DEGs were found in the immature stage where synthesis of fatty acids and carbohydrates were most active.

CONCLUSIONS

The overall interaction of rust control and fruit thinning management showed that stress influences the bean's defense response and the chemical composition in a cultivar dependent manner.

References:

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