

Histochemical Differences in *Coffea* Genotypes Resistant and Susceptible to the Coffee Leaf Miner

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SUMMARY

The leaf miner *Leucoptera coffeella* is the major pest of coffee culture. The Coffee Breeding Program of the Instituto Agronômico (IAC) has been transferring, through traditional crossings, genes that confer the resistance to the leaf miner from the species *C. racemosa* to the susceptible species *C. arabica*. The main objective of this study was to characterize leaf tissues, at histological and biochemical level from the parental species *C. racemosa* and *C. arabica*, and also from their hybrids exhibiting different resistance levels. Results reveal that there are significant differences in leaf tissue thickness between parental species *C. arabica* and *C. racemosa*. However, in hybrids analysis no such difference could be observed between resistant and susceptible progenies, suggesting that the anatomical differences of parental genotypes may not be related to coffee resistance mechanisms to *L. coffeella*. Results of biochemical analysis demonstrated that the activity of peroxidase (POD) was the only one affected by the attack of the leaf miner, and no other differential response was observed between resistant and susceptible hybrid progenies. In this case, the activation of POD was related to the insect damage rather than to resistance mechanisms. The activity of polyphenol oxidase (PPO) was increased in *C. racemosa* leaves upon leaf-miner attack. Concentration of phenols and chlorogenic acid were significantly higher in leaves of *C. arabica* and hybrid progenies, but were reduced after insect infestation. In the other hand, in *C. racemosa* leaves an increase of chlorogenic acid levels was observed in the presence of larvae, at four days after eclosion. However, average concentration of phenols and chlorogenic acid was similar among resistant and susceptible hybrid progenies. Also, all hybrid progenies showed similar protein levels and same pattern of PPO activity. The results obtained in this work suggest that the phenolic oxidation catalyzed by PPO and POD is not directly related to coffee defense mechanisms against *L. coffeella*.

Key-words: Coffee, *Coffea racemosa*, pest resistance, *Leucoptera coffeella*, oxidative enzymes, palisade parenchyma