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HISTOCHEMICAL DIFFERENCES IN *COFFEA* GENOTYPES RESISTANT AND SUSCEPTIBLE TO THE COFFEE LEAF MINER

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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 clorogenic 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 clorogenic acid levels was observed in the presence of larvae, at four days after eclosion. However, average concentration of phenols and clorogenic 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 direct1y related to coffee defense mechanisms against *L. coffeella*.

Key Words – Coffee, *Coffea racemosa*, pest resistance, *Leucoptera coffeella*, oxidative enzymes, palisade parenchyma.

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BIODIVERSITY OF ROOT KNOT NEMATODES, *MELOIDOGYNE* SPP., ON COFFEE IN CENTRAL AMERICA

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A survey was carried out in different coffee production regions of Central America in order to assess the biodiversity of root knot nematodes (RKN), *Meloidogyne* spp., parasitizing the roots of coffee trees in this region. Populations extracted from roots were reared on tomato and/or coffee plants before realizing their diagnostic by isozyme electrophoresis (esterase phenotype, Est). *M. exigua* (Est E1, Rm: 1.5) appeared as the RKN with larger distribution on coffee in Central America with large presence in Honduras, Nicaragua and Costa Rica. This species was observed in just one sample from Guatemala. The dominance of *M. paranaensis* (Est P1, Rm:1.32 and P2, Rm:0.9, 1.32) on coffee in Guatemala was confirmed on populations collected on different geographical regions in this country. This RKN has not been detected in others countries of the region. The recently described species, *M. izalcoensis*, (Est I4=Sa4, Rm:0.86, 0.96, 1.24, 1.30) on coffee in El Salvador seems to be largely scattered on coffee in the south-eastern region of Izalco. The very pathogenic species, *M. arabicida* (Est AR2, Rm:1.20, 1.40) was detected in others regions than Turrialba valley in Costa Rica where it was originally described. Est I1 phenotype (Rm: 1.0), characteristic of *M. incognita*, was found on some populations from Costa Rica and for one population from El Salvador. These are the first based on esterase diagnostic reports of *M. incognita* on coffee in Central America. *M. arenaria* (Est A2, Rm: 1.20, 1.30) was observed in several farms in the south-eastern region of Izalco in El Salvador. *M. hapla* (Est H1, Rm:1.1) was observed in two highland sites, one in Guatemala and the other in El Salvador. New reports of *M. mayaguensis* (Est M2, Rm: 0.79, 1.08) in Central America were observed. One came from one coffee tree sample in Costa Rica and the other from only few coffee trees in Guatemala. Est A1 (Rm: 1.30), characteristic of *M. arenaria* and other species, was observed for one population from Guatemala. This population is under genetic and morphologic studies in order to conclude on its taxonomic statute. Attention should be given to this population since root symptoms even on *C. canephora* rootstock are very severe. Large RKN interspecific diversity was observed on coffee in Central America though region or state economic importance for coffee crop has been just demonstrated for the four first cited species. Pathogenicity must be studied for the RKN newly reported on coffee in this region. Almost all samples collected in this survey presented just one RKN species at a time. Intra-specific genetic and biologic diversity is under study to complete the information on this RKN biodiversity on coffee in Central America.