II CONGRESSO LATINOAMERICANO DE ACAROLOGIA E VI SIMPÓSIO BRASILEIRO DE ACAROLOGIA
29 DE JULHO A 02 DE AGOSTO DE 2018 - PIRENÓPOLIS, GOIÁS, BRASIL
ISBN: 978-85-66836-21-9

MAKING A BETTER HOME: MODULATION OF PLANT DEFENSIVE RESPONSE BY *Brevipalpus* MITES

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False-spider mites of the genus *Brevipalpus* are polyphagous pests that attack hundreds of plant species of very distinct families worldwide. Besides causing injuries to some plant species, these mites may also act as vectors for many plant viruses that threaten ornamental plants and economically important crops such as citrus and coffee. To better understand the molecular mechanisms behind plant-mite interaction we used an RNA-Seq approach to assess the global response of *Arabidopsis thaliana* plants along the course of the infestation with *B. yothersi*, the main vector species within the genus. Overall, 5005 differentially expressed genes were detected. Mite infestation deregulated 1755, 3069 and 2680 genes at 6 hai, 2 dai and 6 dai, respectively, with common and specific changes. Gene set enrichment analysis revealed a clear modulation of the plant immune system. Biological processes enriched at all time points were markedly related to defense against herbivores and other biotic stresses involving the defense hormones salicylic acid (SA) and jasmonic acid (JA). All genes from the SA and JA pathways were up-regulated at least in one of the time points. To determine if the hormone levels were altered in plants challenged with *Brevipalpus* mites, we measured the SA and JA contents by LC-MS/MS. Levels of both hormones were higher in mite-infested plants than in the non-infested ones, supporting the induction of genes from both pathways. To further clarify the functional relevance of the plant hormonal pathways on the interaction, we evaluated the mite performance on Arabidopsis mutants impaired in SA- or JA-mediated response. Mite oviposition was lower on mutants defective in SA biosynthesis (*sid2*) and signaling (*npr1*), showing a function for SA pathway in improving the mite reproduction. No reduction on mite ovoposition was observed on the mutants affected in the JA signaling (*jar1* and *coi1*), suggesting that the higher mite reproduction due to the induction of the SA pathway is not related to the antagonism on the JA pathway. Collectively, these results suggest that *Brevipalpus* mites manipulate the plant defensive response to render the plant more susceptible to its colonization by inducing the SA-mediated pathway. Mite´s ability to modulate the plant physiology in their favor might support the high polyphagous nature of *Brevipalpus* mites.

Keywords: plant-herbivore interaction, plant hormones, defense pathways, *Arabidopsis*, RNA-Seq.
Financial support: FAPESP, CNPq.