

Mechanism of Fenpropathrin Resistance in Red Spider Mite, *Oligonychus coffeae* (Acarina: Tetranychidae), Infesting Tea [*Camellia sinensis* L. (O. Kuntze)]

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Abstract Red spider mite (RSM), *Oligonychus coffeae* (Nietner) (Acarina: Tetranychidae), has gained special attention in view of their widespread occurrence as a pest on tea [*Camellia sinensis* L. (O. Kuntze)]. The development of acaricide (fenpropathrin) resistance has been screened in field populations (FPs) of RSMs from different tea-growing regions of south India and compared with a laboratory-susceptible population (SP) based on toxicity bioassay, detoxifying enzyme activities, analysis of acetylcholine esterase gene (AChE, 2064 bp), and their expression pattern using semiquantitative RT-PCR. The increased resistance ratio (RR, 1.39 to 2.13) in LC₅₀ of fenpropathrin observed in field populations of RSM provides a baseline for screening the development of resistance to fenpropathrin. This resistance developed due to hyperexpression of detoxifying enzymes, i.e., esterase (RR of 1.43 to 2.53) and glutathione S-transferase (RR of 1.11 to 1.86), and overexpression of AChE gene at 1.4 to 2.7-fold. These results necessitate molecular studies and warrant the continuous monitoring of acaricide susceptibility and resistance pattern in order to analyze the usefulness of AChE gene as target for developing alternate pest control strategies and management of pesticide resistance in tea ecosystem.

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