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Abstract

The two-spotted mite, *Tetranychus urticae* is considered a key pest of ornamental plants. The objective of this study was to investigate the two-way interaction between ornamental host plants and *T. urticae*, the effect of *A. wilkesiana*, *A. tricolor* and *D. erecta* ornamental host plants on the developmental stages, fecundity, life table parameters, acceptance and suitability of *T. urticae*, also, the effect of *T. urticae* infestation on biochemical characteristics of the three ornamental plants was investigated. Toxicity, ovicidal, repellency and oviposition deterrence effects of Vertimec (1.8% EC) and ethanol, acetone and aqueous crude extracts of *Nigella sativa*, *Chamomilla recutita* and *Thymus vulgaris* were evaluated against *T. urticae*. The activities of the detoxifying enzymes α , β esterases, glutathione-S-transferase (GST) and Acetyl choline esterase (AChE) in *T. urticae* treated with LC₅₀ of *N. sativa* ethanol extract and Vertimec were determined.

Egg incubation periods of *T. urticae* on *A. wilkesiana*, *A. tricolor* and *D. erecta* excised leaf discs were not affected by the ornamental plant. On *D. erecta* leaf discs, all larvae died after 2-5 days. Developmental periods of larvae, protonymph and deutonymph were significantly affected by the plant species. The highest net reproductive rate (R_o), intrinsic rate of natural increase (r_m), the finite rate of increase (λ) per day and sex ratio were reported on *A. wilkesiana*. More than 80% of the mites settled on *A. wilkesiana* and *A. tricolor* plant discs while *D. erecta* showed the lowest acceptance (17.92%). *T. urticae* infestation induced significant increase in total nitrogen, protein, phenol, flavonoid and proline of *A. wilkesiana* leaves as compared with un-infested ones. *A. tricolor* infestation resulted in significant increase in total carbohydrate and flavonoid. Proline and total

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flavonoid showed a significant increase in infested *D. erecta*. Meanwhile, *A.wilkesiana* infestation by the mite caused a significant decrease in total carbohydrates. On the other hand, no significant effect of mite feeding was detected on total nitrogen, protein, phenol and proline in infested *A. tricolor* and total nitrogen, protein, carbohydrates and phenol contents in infested *D. erecta*. Vertimec showed the highest toxicity against *T. urticae* with LC₅₀ value of 0.000001 mg/ml, followed by *N. sativa* ethanol and acetone extracts with LC₅₀ values of 16.08 and 21.16 mg/ml, respectively. Maximum ovicidal (76.53%) and repellency effect (97.53%) were induced by *N. sativa*- acetone extract. Acetone and ethanol extracts of *C. recutita* had the highest oviposition deterrent effects (91.61 and 91.30%), respectively. The activity AchE enzyme significantly increased after treatment with LC₅₀ of Vertimec while, the activity of α , β esterases and GST enzyme did not significantly differ after treatment with LC₅₀ of Vertimec. α , β esterases, GST and AchE enzyme activities significantly decreased after treatment with LC₅₀ of *N. sativa* ethanol extract.

Key words: *Tetranychus urticae*, developmental periods, host plant acceptance and suitability, *Nigella sativa*, *Chamomilla recutita* and *Thymus vulgaris* extracts, Vertimec 1.8% EC, ornamental plants.