

**FEEDING HABITS OF *TETRANYCHUS URTICAE*  
KOCH (ACARI : TETRANYCHIDAE)  
ON  
*SOLANUM* SPECIES**

**By**

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## ABSTRACT

Ahmed Eid Abdel-Megeed Mahgoob. Feeding Habits of *Tetranychus urticae* Koch (Acari :Tetranychidae) on *Solanum* species. Unpublished Doctor of Philosophy Degree, Department of Plant Plant Protection, Faculty of Agriculture, Ain Shams University 2000.

Four *Solanum* species of eggplant and potato were evaluated for resistance to *Tetranychus urticae* Koch and its effect on the leaf chemical components. The egg-plant species were *S. mammosum* L. PI 245968 (a wild species) and *S. melongena* ( a cultivated species), while potato species were *S. berthaultii* Haweeks PI 265857(a wild species) and *S. tuberosum* L. (a cultivated species). Evaluation of resistance was based on the mite population in the greenhouse. The wild species of eggplant and potato were more highly resistance than cultivated ones. The eggplant, *S. melongena*, was more highly susceptible than the potato *S. tuberosum*.

Mite infestation reduced the chlorophyll and phosphorus content in infested plant leaves of cultivated eggplant and potato. Also there were a reduction in the leaf area and plant length of eggplant *S. melongena*. Mite feeding affected the leaf tissue structure and destroyed chloroplasts at the feeding sites.

The leaf surfaces of eggplant and potato wild species were covered with glandular trichomes, while the cultivated eggplant had non-glandular trichomes. Crude leaf surface washes of eggplant and potato (wild species) caused repellency, reduced fecundity and were

toxic to females *T. urticae*. Crude washes of potato *S. tuberosum* had similar but less activity.

A series of experiments were conducted to study the biochemistry and activity of trichome exudates from the cultivated and wild species of eggplant and potato. Specifically, crude leaf washes were removed, then fractionated and subfractionated via Thin Layer Chromatography (TLC) and High Performance Liquid Chromatography (HPLC). To detect the toxic effect of subsequent fractions and subfractions against females of *T. urticae*, a novel bioassay technique was developed. All fractions and subfractions were bioassayed. Finally the highest toxic subfractions were purified using (HPLC), then were identified using Gas Chromatography-Mass spectrometer.

Crude washes of eggplant *S. mammosum* yielded 15 fractions, while crude washes of *S. melongena* yielded 5 fractions. Crude washes of potato *S. berthaultii* yielded 10 fractions, while crude washes of *S. tuberosum* yielded 4 fractions by TLC. The fractions of *S. mammosum* and *S. berthaultii* were more toxic than those of *S. melongena* and *S. tuberosum*.

The toxic fractions of *S. mammosum* yielded 57 subfractions, while the toxic fraction of *S. berthaultii* yielded 8 subfractions were which separated by HPLC. The subfractions from *S. mammosum* were more toxic than those from *S. berthaultii*. The highest toxic subfraction of *S. mammosum* was identified as dodecanal, while the most toxic subfraction obtained from *S. berthaultii* consisted of sugar esters.

Key words:

*Tetranychus urticae* (Tetranychidae); *Solanum* species, eggplant, potato, glandular trichomes, plant resistance, feeding damage, chlorophyll, phosphorous, phenol.

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