

MITES ASSOCIATED WITH ORNAMENTAL PLANTS

By

BASSEM ABDEL-NASSER ABASS SOUDY
B.Sc. Agric. Sci. (Plant Protection), Fac. Agric., Cairo Univ., 2013

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APPROVAL SHEET

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Agric. Sci. (Acarology)**

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ABSTRACT

Population dynamics of *Tetranychus urticae* and *Euseius scutalis* on *Hibiscus sabdariffa*, *Mentha piperita*, *M. vridis*, and *Synogonium podophyllum* were recorded from September 2014 to September 2015 at Qalyubia and Giza governorates. A positive correlation between population densities of both mites and weather factors was occurred. The results improved that population of *T. urticae* and *E. scutalis* increased to high numbers in November and December, after word it decreased in March and April.

Eleven species belonging to nine genera and seven families were identified from the previous plants at the same regions, where *S. podophyllum* plants has the highest number of total count of soil mites (60.44%) as predacious, fungivorous, and free living followed by (40.29%) in *H. sabdariffa*; while the lowest were noted in *M. piperita* (27.43%) and *M. vridis* (28.65%).

The high values of *M. piperita* essential oil were on *M. vridis* plants at LC₅₀ in Lower limit (ml/ml 0.78811.313µl L-1 air) and in Upper limit (ml/ml 1.516 µl L-1 air). The low values of *M. vridis* essential oil were on *M. piperita* plants at LC₅₀ in Lower limit (ml/ml 0.7502µl L-1 air) and in Upper limit (ml/ml 1.5517µl L-1 air), The estimated lethal concentration value was 1.146(µl L-1 air) for the two tested essential oils.

The number of respiratory stomata in *M. vridis* was more than in *M. piperita*. Respiratory stomata diameter in *M. vridis* and *M. piperita* were much close. Trichomes length in *M. vridis* was longer than in *M. piperita*. Diameter of oily glands on upper and under surfaces in *M. vridis* was larger than in *M. piperita*. The mites selected between oily glands, trichomes and respiratory stomata in both mint species when feeding. Number of oil glands was more in *M. vridis* than in *M. piperita*.

Histology of *M. viridis* and *M. piperita* leaves showing the differences between two species in leaf structure. The most important leaf structure in aromatic plants is oily glands as found in the external parts (both upper and lower epidermis). The number of oil glands on leaves of *M. viridis* was more than in *M. piperita*; the trichoms in *M. viridis* was more present in epidermis than in *M. piperita*; the spongmephyll represented in *M. viridis* was much thickness than in *M. piperita*.

The essential oils of two mint species from leaves contained 71 compounds representing 99.61% (65.21% oxygenated compounds and 34.4% non-oxygenated compounds) of the total oil constituents identified from of *M. viridis* before infestation, and 90.95% (76.47% oxygenated compounds and 14.48% non-oxygenated compounds) after infestation, 99.65% (90.23% oxygenated compounds and 9.42% non-oxygenated compounds) from *M. piperita* before infestation, and 99.98% (96.21% oxygenated compounds and 3.77% non-oxygenated compounds) after infestation.

Key words: Biodiversity, population dynamics, histology, morphology, phytochemical, essential oils, GC/MAS, *Tetranychus urticae*, *Euseius scutalis*, *Hibiscus sabdariffa*, *Mentha piperita*, *M. vridis*, *Synogonium podophyllum*, organic farming, Egypt.

DEDICATION

I dedicate this work to ALLAH who give me the power and health my father, mother, brothers, and friends as well who give me prayers, love, patience, support and help.

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Firstly and foremost of all, thanks to Allah for his help and providing me with the power and health to complete this work,

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