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“Dissertation

abstract”

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DISSERTATION TITLE: Chemical Studies on Some Natural Extracts and Their Constituents to Control Some Aphid Species. .		

DISSERTATION ABSTRACT (ONE PAGE A4)

Aphid pest is considered one of the most serious pests in Egypt that infest field crops and fruit trees causing damage to them due to the several overlapping generations. Using synthetic chemical compounds to control aphids causes serious problems and damage to the environment, man, animals and plants. So that, we are in critical need for more safe natural or botanical aphicides.

The aim of this work was searching for natural insecticides in some available Egyptian plants, especially (as aphicides) against *Aphis craccivora* and *Brevicoryne brassicae*. Ten Egyptian wild plants available in Al-Arish, Sinai and Nile Delta were collected and bioassay-screened as aphicides.

On the basis of the data collected from literature and the results of bioassay screening, three plant species were selected for the detailed study and these plants are:-

1. *Haloxylon salicornicum*
2. *Zygophyllum coccineum*
3. *Mentha longifolia*

In this study forty seven compounds were separated and classified into three alkaloids (1, 3 and 4); one carbamate derivative (28); nine terpenoids (5-7, 30, 31 and 41-44); fourteen shikimates (8-13 and 32-39); nineteen fatty acids and fatty acid derivatives (14-19, 20-27, 40 and 45-48) and one miscellaneous compound (29). From the isolated compounds one compound is isolated naturally for the first time (28).

The above compounds were isolated by different chromatographic methods (CC and TLC) and identified by spectroscopic measurements as IR, UV, MS, ¹H-NMR, ¹³C-NMR, DEPT, ¹H-¹H-COSY, HMQC and HMBC.

These extracts and compounds were tested against *Aphis craccivora* and *Brevicoryne brassicae*; the results revealed that chloroform extract from *H. salicornicum* and ethyl acetate extract from *Z. coccineum* were the most effective extracts against the two aphid species. In addition, anabasine (1) compound was the active ingredient found in *H. salicornicum* and the most toxic compound against the two aphid species.

Key words: Botanical aphicides, *Aphis craccivora*, *Brevicoryne brassicae*, *Hyoscyamus muticus*, *Zygophyllum coccineum*, *Artemisia monosperma*, *Salvia deserti*, *Peganum harmala*, *Deverra tortuosa*, *Haloxylon salicornicum*, *Achillea fragrantissima*, *Calotropis procera*, *Mentha longifolia*, alkaloids, carbamate, terpenoids, shikimates, fatty acids, fatty acid derivatives, CC, TLC, IR, UV, MS, ¹H-NMR, ¹³C-NMR, DEPT, ¹H-¹H-COSY, HMQC and HMBC and anabasine.

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ARABIC SUMMARY	

ABBREVIATIONS

Abbreviations	Title
UV	Ultra violet
IR	Infra red
MS	Mass Spectrometry
GC/MS	Gas chromatography-Mass-Spectrometry
¹H-NMR	Proton Nuclear Magnetic resonance
¹³C-NMR	Carbon 13 Nuclear Magnetic resonance
DEPT	Distortionless Enhancement by Polarization transfer
¹H-¹H-COSY	Correlation via ¹ H- ¹ H Coupling
HMQC	Heteronuclear Multiple Quantum Coherence
HMBC	Heteronuclear Multiple Bond Correlation
GC	Gas chromatography
HPLC	High performance liquid chromatography
R_t	Retention time
R_f	Retention flow
CC	Column Chromatography
TLC	Thin Layer Chromatography
PTLC	Preparative Thin Layer Chromatography
LC₅₀	Lethal concentration for 50% of individual numbers
LC₉₀	Lethal concentration for 90% of individual numbers
GC	Gas chromatography