

## **EVALUATION THE ACARICIDAL EFFECTS OF SOME PLANT EXTRACTS ON TWO SPOTTED SPIDER MITE *TETRANYCHUS URTICAE* KOCK UNDER LABORATORY CONDITION (ACARI: TETRANYCHIDAE)**

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### **ABSTRACT**

This experiment was conducted to evaluate acaricidal effects of several plant extract Aqueous garlic ' Anise oil 'Garlic oil and linen seed oil at different doses 1<sub>cm</sub>' 1.5<sub>cm</sub> and 2<sub>cm</sub> /litre of water in laboratory against spotted spider mites *Tetranychus urticae* koch . Results showed that mortality were 68 ' 86 and 96 at 1<sub>cm</sub> ' 1.5<sub>cm</sub> and 2<sub>cm</sub> for ' Anise oil ' Aqueous garlic and Aqueous garlic respectively. Therefore it's recommended to be applied in biological control as part of integrated pest management programs. further studies needed to support those finding on other crops and pests.

**Keywords:**Biological control plant extract , Aqueous garlic ' Anise oil 'Garlic oil and linen seed oil,mites, *T.urticae*.

### **INTRODUCTION**

Two spotted spider mite *Tetranychus urtica* (Acari: Tetranychidae) considered to be serious pest on greenhouses (Lee *et al* 2003) *T.urticae* causes injury include flecking , discoloration(bronzing) and scorching of leaves. Injury can lead to leaf drop and plant death. Control of the *T.urticae* with conventional acaricides resulting in its ability to rapid develop resistance to the acaricides used(Cho *et al.* 1995) . Continuation of conventional acaricides use against *T.urticae* can cause serious adverse effect against humanity., the environment and non -target organism, including insect and predatory mites such as *Phytoseiulus persimilis* (Acari: Phytodeiidae)(Kumral *et al.*2010) Therefore ,new control technologies and relevant tactics to reduce the use of conventional pesticides are needed to achieve sustainable management of *T.urticae*(Isman 2001 ; Lee *et al.*2003).Many plant extract are toxic materials to different species of spider mites (Choi *et al* 2004)For exemple extracts of *Capparis aegyptia* (Capparaceae) was toxic to *T.urticae* females(Hussein *et al.*2006) while leaf and seed extracts from *Datura stramonium* had demonstrated acaricidal, repellent, and oviposition deferent activities against the spider mite (Kumral *et al.* 2010).The goal of this study was to find a new safe components for potential use in controlling *T.urticae* .

### **MATAEIALS AND METHODES**

Four plant extracts are used in the present study: Aqueous garlic ' Anise oil 'Garlic oil and linen seed oil provided by faculty of agriculture Ain Chams University,Egypt. Each experiment of each extract was undertaken on three concentrations 1<sub>cm</sub> '1.5<sub>cm</sub> and 2<sub>cm</sub> /litre of water and each replicate

repeated five times and contain five plants. All treatment were precounted before extracts application. One liter plastic sprinkler used from a distance 20 cm to get evenly fog droplets on plant surface. The control replicates had water by the same previous method. Mortality counts were taken after 48 hours from application. The L.C<sub>50</sub> and L.C<sub>90</sub> values were computed according to Finney (1971). phytotoxicity on the treatments plants were observed throughout the experiment .

## RESULT AND DISSCUSSION

### Phytotoxicity

There was no evidence of phytotoxicity found on the foliage , buds or stems of cucumber plant in response to the previous plant extracts.

### Acaricidal activity

The effect of Aqueous garlic extract , Anis oil , garlic oil and Linen oil on the mortality of spotted spider mite *T.urticae* is presented in( Table 1). Three concentrations were used under laboratory condition for each extract, There were no mortality recorded in the controls of all experiments against *T.urticae*. Result in( Table 1) showed that the mortality Aqueous garlic extract was the most effective 86 and 96 at concentrations 1.5 and 2 cm/liter water, respectively . The result of tested oils showed that the mortality of Anis oil was 68 , 69 and 90 at concentrations 1<sub>cm</sub> , 1.5<sub>cm</sub> and 2<sub>cm</sub> /litre of water , respectively. The mortality of garlic oil and Linen oil at the same three previous concentrations were 47 , 53 , 83 , 32 , 39 and 69 respectively.

**Table (1) Mortality of two spotted Spider mite *Tetranychus urticae* by using different plant extracts.**

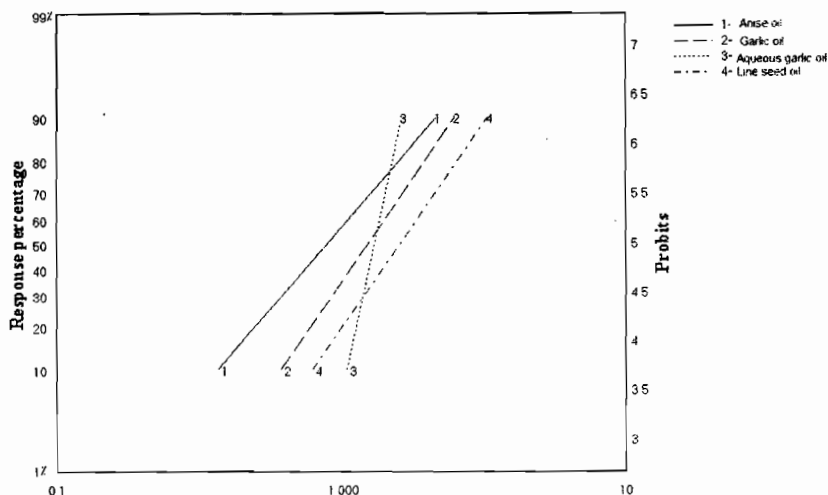
Treatment	CONCENTRATION		
	1 <sub>cm</sub>	1.5 <sub>cm</sub>	2 <sub>cm</sub>
CONTROL	0	0	0
AQUEOUS GARLIC EXTRACT	5	86	96
ANISE OIL	68	69	90
GARLIC OIL	47	53	83
LINEN SEED OIL	32	39	69

The data in table 2 demonstrated that the L.C<sub>50</sub> and L.C<sub>90</sub> values were 890 mg/L and 2160 mg /L , 1239 mg /L and 250.4 mg /L , 1304 mg /L and 162.8 mg /L , and 1604mg/L and 3265 mg /L respectively for Aqueous garlic extract , Anis oil , garlic oil and Linen oil respectively.

**Table (2) Toxicity of different plant extracts on two spotted Spider mite *Tetranychus urticae* .**

PLANT EXTRACT	L.C <sub>50</sub>	L.C <sub>90</sub>	slop
AQUEOUS GARLIC EXTRACT	890 mg/L	2160 mg /L	3.32
ANISE OIL	1239 mg /L	250.4 mg /L	4.194
GARLIC OIL	1304 mg /L	162.8 mg /L	13.31
LINEN SEED OIL	1604mg/L	3265 mg /L	4.15

Data in table ( 2 )and figure ( 1 ) showed that Aqueous garlic extract was the most effective L.C<sub>50</sub> and L.C<sub>90</sub> followed by Anise oil , Garlic oil and Linen seed oil descendingly.



**Fig 1. Toxicity lines of Aqueous garlic extract , Anis oil , garlic oil and Linen oil against two spotted spider mite *T.urticae*.**

In conclusion, in our comprehensive screening, four plant extract oils, Aqueous garlic extract , Anis oil , garlic oil and Linen oil results against two spotted spider mite *T.urticae* are safe and effective approach This study suggest that previous plant extracts are potentially effective, environmentally acceptable, inexpensive, simple and alternative approach for the control of *T.urticae* .

Hyun Sik Roh *et al* 2011 extracted thirty-four plant essential oils which were screened for their acaricidal and oviposition deterrent activities against two-spotted spider mite *T.urticae*. Sandalwood and common thyme oils were observed to be the most effective against *T.urticae*.

Saad El-Zemity *et al* 2006 tested the acaricidal activities of fourteen essential oils and fourteen of their major monoterpenoids against houst dust mites *Dermatophagoides pteronyssinus* Clove ,matrecary,chenopodium,rosemary,eucalyptus and caraway oils were shown to have high activity.

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## تأثير بعض المستخلصات النباتية على اكاروس العنكبوت الاحمر ذات البقعتين

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أجريت هذه التجربة لتوضيح تأثير المستخلصات النباتية مثل مستخلص الثوم المائي وزيت اليانسون ومستخلص زيت الثوم ومستخلص زيت بذرة الكتان على جرعات مختلفة اسم و 1.5 اسم و 2 اسم في المعمل على ورق خيار مصاب باكاروس العنكبوت الاحمر ذات البقعتين. وكانت أعلى تأثير على الاكاروسات هي 1.8 و 1.6 و 1.5 عند تركيزات اسم و 1.5 اسم و 2 اسم لكل من مستخلص الثوم المائي وزيت اليانسون ومستخلص زيت الثوم ومستخلص زيت بذرة الكتان على التوالي.

واوضحت الدراسة ان كل المستخلصات النباتية السابقة اثبتت كفاءة عالية كمبيد اكاروسى وتحتاج المستخلصات النباتية السابقة الى دراسات مستقبلية لدراسة تأثيراتها على الافات الأخرى المرتبطة بمحاصيل معينة.

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