J. Plant Prot. and Path., Mansoura Univ., Vol. 4 (7): 689 - 692, 2013

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

Aiad . K .A
Plant Protection Res. Institute, Agric. Res. Center, Dokki, Giza,Egypt

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_{cm}' 1.5_{cm} and 2_{cm} /litre of water in laboratory against spotted spider mites *Tetranychus urticae* koch . Results showed that mortality were 68 ' 86 and 96 at 1_{cm} ' 1.5_{cm} and 2_{cm} for ' Anise oil ' Aqueous garlic and Aqueous garlic respectevely. 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 humainity., 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* (Capparaaceae) 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_{cm} '1.5_{cm} and 2_{cm} /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 $_{50}$ and L.C $_{90}$ values were computed according to Finney (1971). phytotoxicity on the treatments plants were observed throghout 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_{cm} '1.5_{cm} and 2_{cm} /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.

Treatement	CONCENTRATION		
	1_{cm}	1.5_{cm}	2_{cm}
CONTROL	O	O	O
AQUEOUS GARLIC EXTRACT	5	86	96
ANISE OIL	68	69	90
GARLIC OIL	47	53	83
LINEN SEED OIL	32	39	69

The date in table 2 demonstrated that the L.C $_{50}$ and L.C $_{90}$ 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 $_{50}$	L.C$_{90}$	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** $_{50}$ and L.**C** $_{90}$ followed by Anise oil , Garlic oil and Linen seed oil descendingly.

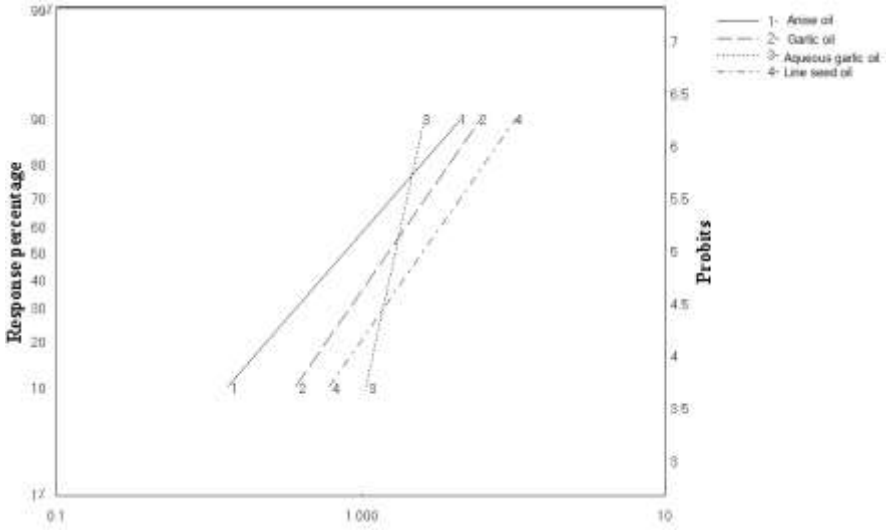

Fig 1. Toxicity lines of Aqueous garlic extract , Anis oil , garlic oil and Linen oil against two spotted spider mite *T.urticae*.

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 monoterpenoides against houst dust mites *Dermatophagoides pteronyssinus* Clove ,matrecary,chenopodium,rosemary,eucalyptus and caraway oils were shown to have high activity.

REFERENCES

Cho JR, Kim YJ, Ahn YJ, Yoo JK, Lee JO (1995) Monitoring of acaricide resistance in field-collected populations of *Tetranychus urticae* (Acari: Tetranychidae) in Korea. Korean J Appl Entomol 34:40–45

Choi WL, Lee SG, Park HM, Ahn YJ (2004) Toxicity of plant essential oils to *Tetranychus urticae* (Acari: Tetranychidae) and *Phytoseiulus persimilis* (Acari: Phytoseiidae). J Econ Entomol 97:553–558

Hussein H, Abou-Elelia M, Amer SAA, Momen FM (2006) Repellency and toxicity of extracts from *Capparis aegyptia* L to *Tetranychus urticae* Koch. (Acari:Tetranychidae). Acta Phytopathol Entomol Hung 41:331–340

Isman MB (2001) Pesticides based on plant essential oils for management of plant pests and disease. International Symposium on Development of Natural Pesticides from Forest Resources. Korea Forest Research Institute, Seoul, pp 1–9

Kumral NA, Cobanoglu S, Yalcin C (2010) Acaricidal, repellent and oviposition deterrent activities of Datura stramonium L. against adult *Tetranychus urticae* (Koch). J Pest Sci 83:173–180

Lee YS, Song MH, Ahn KS, Lee KY, Kim JW, Shin SC, Kim GH (2003) Monitoring of acaricide resistance in two spotted spider mite (*Tetranychus urticae*) populations from rose green houses in Korea. J Asia-Pac Entomol 5:237–240

Fedai Erler 2008 Efficacy of tree trunk coating materials in the control of theapple clearwing, Synanthedon myopaeformis Journal of Insect Science:Vol.10 Article 63.

Finney, J., 1971. Probit Analysis, 2nd Ed. Cambridge University Press, Cambridge, UK.

Hyun Sik Roh , Eu Gene Lim , Jinwoo Kim 2011 Acaricidal and oviposition deterring effects of santalol identified in sandalwood oil against two-spotted spider mite,Tetranychus urticae Koch (Acari: Tetranychidae) J Pest Sci (2011) 84:495–501.

SAAD El-Zemity†1, HUSSIEN Rezk, SAHER Farok, AHMED Zaitoon 2006 Acaricidal activities od some essential oils and their monoterpenoidal constituents against house dust mite , Dermatophagoides teronyssinus (Acari:Pyroglyphidae) JZhejiang Univ SCIENCE B 7(12):957-962 .

تأثير بعض المستخلصات النباتية على اكاروس العنكبوت الاحمر ذات البقعتين

خالد عبد العزيز عياد

معهد بحوث وقاية النباتات – مركز البحوث الزراعية – الدقي –جيزة- مصر

أجريت هذه التجربة لتوضيح تأ ثير المستخلصات النباتية مثل مستخلص الثوم المائى وزيت اليانسون ومستخلص زيت الثوم ومستخلص زيت بذرة الكتان على جرعات مختلفة 1سم و1.5سم و2سم فى المعمل على ورق خيار مصاب باكاروس العنكبوت الاحمر ذات البقعتين .وكانت أعلى تأثير على الاكاروسات هى 68 و 86 و96 عند تركيزات 1سم و1.5سم و2سم لكل من مستخلص الثوم المائى وزيت اليانسون ومستخلص زيت الثوم ومستخلص زيت بذرة الكتان على التوالى.

واوضحت الدراسة ان كل المستخلصات النباتية السابقة اثبت كفائة عالية كمبيد اكاروسى وتحتاج المستخلصات النباتية السابقة الى دراسات مستقبلية لدراسة تأثيراتها على الأفات الأخرى المرتبطة بمحاصيل معينة.

قام بتحكيم البحث

أ.د / عمر عبد الحميد نصار — كلية الزراعة – جامعة المنصورة

أ.د / مراد حسن فهمى — كلية الزراعة – جامعة القاهره