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EFFECT OF SOME EXTRACT PLANT ODOURS AGAINST BEHAVIOR OF WHITEFLY *BEMISIA TABACI* GENN. HOMOPETRA: ALEYRODIDAE IN OKRA FIELD, IN ALEXANDRIA GOVERNORATE, EGYPT

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ABSTRACT: *The effect of five plant extract odours i.e. (garlic, onion, hot pepper, cinnamon and cloves), was studied against behaviour of whitefly B. tabaci adult's and its ability of separation between different odours.*
Accrding to the obtain results, hot pepper, garlic and cloves plants were repellent plants, while Cinnamon and onion were attract plants.
Results indicated that, whitefly adults were highly ability of separate between different plant odours.
Also the population densities of the immature stages of the weight fly were decreases gradually by the effect of these plant odours.

Key words: *Repellent, Attracted, White fly, Odours.*

INTRODUCTION

Whitefly *Bemisia tabaci* Genn. is known as a serious economic insect pest on a wide range of different crops. In Egypt, many authors have reported on B. *Tabaci* biological and ecological studies, (El-Helaly, *et al.,* 1971, Herakly, 1973, El-Said, *et al.,* 1981, Abd El-Fattah, *et al.,* 1984 and Evleen, 2003). However, studies on its behavior is very limited (Romis, *et al.*, 1997, Sant Ana, Josue, *et al.*, 1999, Van Aarde, *et al.*, 1999 and Abou-Fakhr, *et al.*, 2000).

Owing to this facts, the habital and host searching behaviour of whitefly, B. tabaci Genn. (Hom: Aleyrodidae) was assessed using an ability to distinction the plant odours test, also responses to different odour cues were determined.

Thus, the present work has been carried out to study the behavior of *B. tabaci*, in okra field under conditions of 30 ± 2^{0}C and 70 ± 5 R.H.

MATERIALS AND METHODS :

Weekly, visits were made during the period from Jully, 2005 to October, 2005 on the field planted with Okra (*Hibiscus esculentus* L.) at Sabahia farm stead, Alexandria.

The experimental area was divided into plots of (about 100m^2 each) with 3 replicates for each treatment, with the addition of pest control (each replicates were about 20 plants) the survey and numbers of adults and

immature stages of whitefly on plants were achieved during the early growth stages to select the suitable time for applying the treatment before fruites to begin form.

In each plot, five black navels-muslins were hanged which contain of natural material (10 g.) these material once are (Garlic, Onion, Hot-pepper, Cinnamon and Cloves) with dispersal odours.

Also, these materials are surrounded by sticking material without odour.

Weekly, samples of 10 leaves were taken from 10 plants per replicat and examined in the laboratory also replacing the novels-muslin to count adults.

These leaves were kept in tight closed paper bag until their number of immature stages of the pest were counted in the laboratory of the same day. Also, population of the adults whitefly which to strick on black novels-muslin.

The population density expressed as the average number of immature stages of *B. tabaci* per inch square on infested leaves was determined and recorded on given dates.

In order to determine sensibility adours for the adult whiteflies. The efficiency of each treatment was determined by calculating the percent reduction (%R) of the species using Henderson-Tillon's formula (Henderson-Tillon's 1955).

$$R\% = \left[1 - \frac{\text{No. Con. before Trea. (Con.)}}{\text{No. Con. After Trea. (Con.)}} \times \frac{\text{No. Con. after Trea. (T.)}}{\text{No. Con. before Trea. (T.)}} \times 100 \right]$$

RESULTS AND DISCUSSION

Table (1) shows reduction percentage of *B. tabaci* adults and its immature stages in okra plant treated with five black navels (garlic, onion, hat pepper, cinnamon and cloves) during the growing season 2005.

Results indicated that, after one month hot-pepper gave the highest effect against whitefly immature stages (75.41% reduction), whereas, garlic, cloves gave the same effect relatively (48.49 and 48.35% reduction, respectively) also, cinnamon gave effect of 45.75% reduction) while onion gave the lowest effect (39.68% reduction) against whitefly immature stages.

Two month later, hot-pepper was highly effective against whitefly immature stages (9845% reduction) followed by cloves (92.86% reduction), while cinnamon, garlic and onion were gave the lowest effect (88.68, 87.92 and 86.01% reduction) respectively.

Three month later, hot-pepper gave 100% reduction percentage against all whitefly stages followed by cloves and cinnamon that gave the same effect (98.67 and 98.16% reduction), respectively. While both of garlic and onion were gave the lowest effect (91.89 and 91.46% reduction).

Table (1): Effect of extract Plant Odours on Behavior of Whitefly *B. tabaci* in Okra Field, Alexandria, Egypt.

Date	Garlic		Onion		Hot pepper		Cinnamon		Cloves		Control		Perfermances effectes
	Adults	Immature	Adults	Immature	Adults	Immature	Adults	Immature	Adults	Immature	Adults	Immature	
Before to hang													
uly 1/2005		15.0		21.0		19.0		30.0		24.0		21.2	
After to hang													
July 2/2005	-	14.1	1.0	18.8	-	10.0	0.6	25.2	-	21.0	-	32.0	1-Hot pepper (R.)
July 9/2005	-	9.8	4.4	17.1	-	7.3	0.3	20.3	-	18.4	-	23.3	2 Garlic (R.)
July 16/2005	-	4.0	4.3	14.3	-	4.4	1.6	19.1	-	13.3	-	18.8	Cloves (R.)
July 23/2005	-	7.4	6.2	11.1	-	2.3	3.1	14.5	-	9.9	-	19.7	3- Cinnamon (A.)
July 30/2005	-	6.1	3.0	9.3	-	1.9	2.4	12.2	-	6.5	-	24.3	4- Onion(A.)
Average	0.0	8.6	3.8	14.1	-	5.2	1.6	18.3	0.0	13.8	0.0	23.6	
% R.		48.49		39.68		75.41		45.75		48.35			
Aug. 6/2005	-	5.3	3.6	9.1	-	1.2	1.0	9.9	-	6.1	-	31.5	1- Hot pepper (R.)
Aug. 13/2005	-	3.3	6.6	7.0	-	0.9	0.9	8.1	-	4.3	-	57.0	2- Cloves (R.)
Aug. 20/2005	-	2.8	4.2	4.4	-	0.3	0.4	5.5	-	2.2	-	47.9	Cinnamon (A.)
Aug. 27/2005	-	3.3	2.3	3.6	-	0.0	1.3	4.3	-	1.5	-	36.6	Garlic (R.)
Average	0.0	3.7	4.2	6.0	0.0	0.6	0.9	7.0	0.0	3.5	0.0	43.3	Onion (A.)
% R.		87.92		86.01		98.45		88.68		92.86			
Sep 3/2005	-	3.1	4.3	5.4			1.2	3.3	-	1.9	-	49.3	1-Hot pepper (R.)
Sep. 10/2005	-	2.4	1.2	2.4			0.4	2.0	-	0.9	-	22.0	Cloves (R.)
Sep. 17/2005	-	1.3	2.3	1.1				1.3	-	-	-	27.0	Cinnamon (A.)
Sep. 24/2005	-	0.8	1.0	1.2				0.7	-	-	-	34.0	Garlic (R.)
Average	0.0	1.9	2.2	2.8	0.0	0.0	0.4	1.8	0.0	0.5	0.0	33.1	3-Onion (A.)
% R.		91.89		91.46		100.0		98.16		98.67			
Oct. 1/2005	-	0.3	2.2	0.5	-	-	-	1.1	-	-	-	22.1	1-Hot pepper (R.)
Oct. 8/2005	-	0.0	1.1		-	-	-	0.2	-	-	-	20.0	Cloves (R.)
Oct. 15/2005	-	0.1	0.8	1.1	-	-	-	0.0	-	-	-	18.0	2- Garlic (R.)
Oct. 22/2005	-	0.0	0.0	-	-	-	-	0.0	-	-	-	26.0	Cinnamon (A.)
Oct. 29/2005	-	0.0	0.0	-	-	-	-	0.0	-	-	-	21.0	3- Onion (A.)
Average	0.0	0.1	0.8	0.3	0.0	-	-	0.3	0.0	-	-	21.4	
% R.		99.34		98.58	-	100.0	0.0	99.01	-	100.0	-	-	

R. = Repellent.
A. = Attracted.

Four month later hot-pepper and cloves gave 100% reduction percentage against all whitefly stages followed by garlic and cinnamon (99.34 and 99.01% reduction)..the lowest effect caused by onion (98.58% reduction).

Table (1) reveals, the whitefly adults were different response against natural plant extract, odours of (garlic, onion, hot-papper, cinnamon and cloves), i.e. distinction among different odours. This agreement with Hammad, 1965,who mention that there are sensitive region against odours with antena's insects to call sense plates or Sensillae.

Also, results proved some of odour's material were as a repellent materials such as (hot-pepper, garlic and cloves) and other materials were as attract materials such as (onion and cinnamon). This results were agreement with Sant Ana, *et al.* 1999 which supported that *Podisus maculivetris* nymphs use both plant odours and pheromone components in location potential pry and other behaviors.

However, this results were disagreement with Mound 1962 which supported that the colour factor is very effect to *B. tabaci* for attracted to its host, but the plant, odours are no effect for insect response to its host.

In the present work, the results indicat that whitefly adults were highly sinceative and ability of distinction to plant odours. Also we can use these plant as a traps against whitefly adults.

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تأثير روائح بعض النباتات الطبيعية علي سلوك حشرات الذبابة البيضاء

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الملخص العربي

عند دراسة تأثير روائح بعض النباتات الطبيعية (الثوم-البصل-الفلفل-القرفة-القرنفل) علي سلوك حشرات الذبابة البيضاء ومدي قدرتها لتمييز هذه الروائح المختلفة.

أظهرت النتائج أن حشرة الذبابة البيضاء لها القدرة علي التمييز بين روائح النباتات المختلفة وكان لبعض النباتات تأثير طارد مثل (الفلفل-الثوم-القرنفل) وكان للبعض الآخر تأثير جاذب مثل (القرفة-البصل).

كذلك أظهرت النتائج أيضا أن الكثافة العددية للأعمار الغير كاملة للذبابة إنخفضت تدريجيا بسبب تأثير روائح هذه النباتات الطاردة.