

**FIELD EVALUATION OF SOME ATTRACTANTS FOR  
ATTRACTING THE ADULTS OF MEDITERRANEAN  
FRUIT FLY, *CERATITIS CAPITATA* (WIEDEMANN) AND PEACH  
FRUIT FLY, *BACTROCERA ZONATA* (SAUNDERS) IN CITRUS  
ORCHARDS**

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***Abstract***

Evaluation of different attractants for attracting the adults of Mediterranean fruit fly (MFF), *Ceratitis capitata* (Wiedemann) and Peach fruit fly (PFF), *Bactrocera zonata* (Saunders) were carried out through two experiments during the two seasons, 2002/2003 and 2003/2004.

In the 1<sup>st</sup> season (2002/2003), the mean capture per trap per day "CTD" for MFF adults were 0.17, 0.19, 0.05 and 0.04 fly, and the "CTD" for PFF adults were 0.14, 0.08, 0.05 and 0.06 fly for Buminal 5 %, Buminal 10 %, Di-ammonium phosphate 3 % and Bactrogel 1.3 %, respectively.

In the 2<sup>nd</sup> season (2003/2004), the "CTD" for MFF adults were 0.04, 0.05, 0.09, 0.05 and 0.06 fly, and the "CTD" for PFF adults were 0.94, 0.40, 0.72, 0.22 and 0.40 fly for Buminal 2.5 %, Buminal 5 %, Buminal 10 %, Di-ammonium phosph. 2 %, and Di-ammonium phosph. 3 %, respectively.

All the attractants attracted females more than males for MFF adults during the two seasons. For PFF adults, Buminal 5 % only attracted females more than males during the 1<sup>st</sup> season, while during the 2<sup>nd</sup> season, all the attractants attracted males more than females.

**INTRODUCTION**

Fruit flies of family Tephritidae are well known pests. They attack fruits reducing both yield and quality. In Egypt, Mediterranean fruit fly (MFF), *Ceratitis capitata* (Wied.) causes considerably damage and causes significant economic losses in apricot, peach, guava, mango, fig and citrus (Awadallah *et al.*, 1974, Saafan, 1986, Hashem *et al.*, 1987 and Saafan *et al.*, 1989).

During the 90's of the last century, the Egyptian ecosystem had been attacked by one of the most harmful pests, the peach fruit fly (PFF), *Bactrocera zonata* (Saund.). It infested different fruits and vegetables (*e.g.* mango, peach, fig, guava, apple, citrus, tomato, ... etc.) (Oakly, 1948, Narayana and Batra, 1960, Kapoor *et al.*, 1982 and

El-Minshawy *et al.*, 1999). Hafez and Ezzat (1967) used traps baited with 3 % solution of diammonium phosphate for monitoring population of *C. capitata* in the New Valley. Steyskal (1977) mentioned that protein hydrolysate used in McPhail traps (1983) and Anonymous (1985) mentioned that the hydrolyzed protein preparation was used as a bait for certain insects such as med-fly.

Saafan (2000) carried out four experiments at Kalubia Governorate to evaluate some attractants for attracting MFF adults. Hanafy *et al.* (2001) carried out field evaluation of Di-ammonium phosphate compounds for attracting adults of PFF and MFF in guava orchards at Alexandria region.

Field evaluation of some concentrations of Di-ammonium phosphate for attracting PFF adults were carried out at Fayoum Governorate (Mohammed, 2003). He mentioned that Di-ammonium phosph. with 3 % concentration was significantly the most attractive for PFF adults.

The present investigation was designed to evaluate the efficacy of some attractants for attracting the adults of Mediterranean fruit fly (MFF), *Ceratitidis capitata* (Wied.) and Peach fruit fly (PFF), *Bactrocera zonata* (Saund.) in citrus orchards.

The present investigation is the second one of a serial investigations carried out on mango plantation, on citrus plantation, and on apricot plantation.

## MATERIALS AND METHODS

Two experiments were carried out in citrus plantation at Sinuris & Ibshaway districts, Fayoum Governorate through the two successive seasons, 2002/2003 and 2003/2004, to evaluate the efficacy of some different attractants for attracting the adult flies of Mediterranean fruit fly, *Ceratitidis capitata* (Wied.) and Peach fruit fly (PFF), *Bactrocera zonata* (Saund.).

The experiments were carried out in three citrus locations (orchards) which represent the different dynamics of MFF and PFF population.

- \* **The first season (2002/2003):** The 1<sup>st</sup> experiment was carried out during six weekly inspection (10/12/2002 to 21/1/2003), and the attractants were used as follow :
- Buminal (protein hydrolyzate) as a food attractant (in two concentrations, 5 % and 10 %, during the 1<sup>st</sup> season, and in three concentrations, 2.5 %, 5 % and 10 % during the 2<sup>nd</sup> season).
  - Di-ammonium hydrogen orthophosphate as an aggregating attractant (in one concentration, 3 % during the 1<sup>st</sup> season and in two concentrations, 2 % and 3 % during the 2<sup>nd</sup> season).

- Bactrogegel, wettable powder which is mixed with water to form a gel, for controlling fruit flies (in one concentration, 1.3 % during the 1<sup>st</sup> season only).

McPhail traps (described by Nicanor *et al.*, 1993) were used and baited weekly with the used attractants.

Five replicates for each concentration were placed in a randomized distribution and the distance between two adjacent traps was 15 meters. The experiment was remained for six weeks. Every week, traps position were changed in a rotation. This rotation gave chance for every concentration of every attractant the same chance to take all position in experiment distance during the experiment periods. The captured flies were collected in plastic jar, inspected in laboratory of Plant Protection Research Institute (PPRI). The captured flies for MFF and PFF (separating males and females) were recorded and the mean captured per trap per day "CTD" for males, females and their total was calculated.

**The second season (2003/2004):** The experiment was carried out during six weekly inspections (2/12/2003 to 13/1/2004). The same procedures for traps, lures, collecting captured flies, inspections and calculations were conducted as in the 1<sup>st</sup> season.

Results were analysed using two way ANOVA. Mean separation was conducted using L.S.D. ( $P > 0.05$ ) (MSTAT Program).

## RESULTS AND DISCUSSION

To evaluate efficacy of some different attractants for attracting MFF and PFF adults, two experiments were carried out at Sinuris and Ibshaway districts, Fayoum Governorate on citrus plantation during the two successive seasons, 2002/2003 and 2003/2004.

**The first season (2002/2003):** During the 1<sup>st</sup> season, the experiment was carried out through six weekly inspections (10/12/2002 - 21/1/2003) at three locations (orchards).

The comparison between attractants, locations and periods of inspections will done by the term of "CTD" captured per trap per day.

### A- Mediterranean fruit fly (MFF) captured :

- **The 1<sup>st</sup> location:** Represent relatively the high population for MFF. Table (1) shows that the total mean of "CTD" was 0.34, 0.17, 0.08 and 0.06 fly for Buminal 5%, Buminal 10%, Di-ammon.phosph. 3 % and Bactrogegel 1.3 %, respectively.

The statistical analysis of the data showed significant differences between Buminal 5 % and the two attractants, Di-ammon.phosph. 3 % and Bactrogel 1.3 %, while there were insignificant differences in between Buminal 5 % and Buminal 10 % also between Buminal 10 %, Di-ammon. phosph. 3 % and Bactrogel 1.3 %.

- **The 2<sup>nd</sup> location:** Represent relatively the mid population for MFF. Data in Table (1) indicated that the total mean of "CTD" was 0.13, 0.06, 0.03 and 0.04 fly for Buminal 5 %, Buminal 10 %, Di-ammon.phosph. 3 % and Bactrogel 1.3 %, respectively.

The statistical analysis of the data showed significant differences between Buminal 5 % and the other three attractants, while there were insignificant differences in between Buminal 10%, Di-ammon.phosph. 3 # and Bactrogel 1.3%.

- **The 3<sup>rd</sup> location:** Represent relatively the low population for MFF. Data presented in Table (1) showed that the total mean of "CTD" was 0.05, 0.03, 0.03 and 0.02 fly for Buminal 5%, Buminal 10%, Di-ammon.phosph. 3 % and Bactrogel 1.3%, respectively.

The statistical analysis of the data showed insignificant differences in between the four attractants.

Summarizing the data in Table 1 it seemed that the grand mean of "CTD" for the three locations was 0.17, 0.09, 0.05 and 0.04 fly for Buminal 5 %, Buminal 10 %, Di-ammon.phosph. 3 % and Bactrogel 1.3 %, respectively.

The statistical analysis of the data, in Table 1 showed significant differences between Buminal 5 % and the two attractants, Di-ammon-phosph. 3 % and Bactrogel 1.3 %. There were insignificant differences in between Buminal 5 % and Buminal 10 %, also in between Buminal 10 %, Di-ammon.phosph. 3 % and Bactrogel 1.3 %.

Table 1. Mean capture per trap per day "CTD" of MFF in McPhail traps baited with different attractants, in citrus orchards at the three locations during the 1st season (10/12/2002 to 21/1/2003).

Attractants	Mean of CTD of MFF during inspection periods									Grand mean		
	1st location			2nd location			3rd location					
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Buminal 5 %	0.07	0.27	0.34 a	0.02	0.11	0.13 a	0.01	0.04	0.05 a	0.03 a	0.14 a	0.17 a
Buminal 10 %	0.03	0.14	0.17 ab	0.02	0.04	0.06 b	0.01	0.02	0.03 a	0.02 a	0.07ab	0.09 b
di-Ammonium phosphate 3 %	0.03	0.05	0.08 b	0.01	0.02	0.03 b	0.01	0.02	0.03 a	0.02 a	0.03 b	0.05 b
Bactrogegel 1.3 %	0.01	0.05	0.06 b	0.01	0.03	0.04 b	0.01	0.01	0.02 a	0.01 a	0.03 b	0.04 b
Mean	0.03 a	0.13 a	0.16 a	0.01 b	0.05 b	0.06 b	0.01 b	0.02 b	0.03 b	0.02	0.07	0.09

LSD values at 0.05 for :

Locations :

Male                      0.02  
 Female                    0.07  
 Total                      0.07

Attractants :

0.02  
 0.08  
 0.09

**B. Peach fruit fly (PFF) captured :**

- **The 1<sup>st</sup> location:** Represent relatively the high population for PFF. Table 2 shows that the total mean of "CTD" was 0.24, 0.16, 0.06 and 0.10 fly for Buminal 5%, Buminal 10 %, Di-ammon.phosph. 3 % and Bactrogel 1.3 %, respectively.

The statistical analysis of the data showed significant differences between Buminal 5 % and the two attractants, Di-ammon.phosph. 3 % and Bactrogel 1.3 %, and also between Buminal 10 % and Di-ammonium phosph. 3 %, while there were insignificant differences in between Buminal 5 % and Buminal 10 %, and also in between Buminal 10 % and Bactrogel 1.3 %.

- **The 2<sup>nd</sup> location:** Represent relatively the mid population for PFF. Data in Table 2 indicated that the total mean of "CTD" was 0.10, 0.04, 0.05 and 0.05 fly for Buminal 5 %, Buminal 10 %, Di-ammon.phosph. 3 % and Bactrogel 1.3 %, respectively.

The statistical analysis of the data showed significant differences between Buminal 5 % and the other three attractants, while there were insignificant differences in between Buminal 10 %, Di-ammon.phosph. 3 % and Bactrogel 1.3 %.

- **The 3<sup>rd</sup> location:** Represent relatively the low population for PFF. Data presented in Table 2 showed that the total mean of "CTD" was 0.07, 0.03, 0.03 and 0.04 fly for Buminal 5%, Buminal 10%, Di-ammon.phosph. 3% and Bactrogel 1.3%, respectively.

The statistical analysis of the data in Table 2 showed significant differences between Buminal 5 % and the other three attractants, while there were insignificant differences in between Buminal 10 %, Di-ammon. phosph. 3 % and Bactrogel 1.3%.

Summarizing the data in Table 2 it seemed that the grand mean of "CTD" for the three locations was 0.14, 0.08, 0.05 and 0.06 fly for Buminal 5%, Buminal 10%, Di-ammon.phosph. 3% and Bactrogel 1.3%, respectively.

The statistical analysis of the data, in Table 2 showed significant differences between Buminal 5% and the other three attractants, while there were insignificant differences in between Buminal 10%, Di-ammon.phosph. 3% and Bactrogel 1.3%.

Table 2. Mean captured trap per day "CTD" of PFF in McPhail traps baited with different attractants, in citrus orchards at the three locations during the 1<sup>st</sup> season (10/12/2002 to 21/1/2003).

Attractants	Mean of CTD of MFF during inspection periods									Grand mean		
	1 <sup>st</sup> location			2 <sup>nd</sup> location			3 <sup>rd</sup> location					
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Buminal 5 %	0.11	0.13	0.24 a	0.03	0.07	0.10 a	0.03	0.04	0.07 a	0.06 a	0.08 a	0.14 a
Buminal 10 %	0.08	0.08	0.16 ab	0.02	0.02	0.04 b	0.02	0.01	0.03 b	0.04 a	0.04 b	0.08 b
di-Ammonium phosphate 3 %	0.04	0.02	0.06 c	0.03	0.02	0.05 b	0.02	0.01	0.03 b	0.03 a	0.02 b	0.05 b
Bactrogegel 1.3 %	0.06	0.04	0.10 bc	0.02	0.03	0.05 b	0.02	0.02	0.04 b	0.03 a	0.03 b	0.06 b
Mean	0.07 a	0.07 b	0.14 a	0.02 b	0.03 a	0.05 b	0.02 b	0.02 b	0.04 b	0.04	0.04	0.08

LSD values at 0.05 for :

Locations :

Male 0.03  
 Female 0.03  
 Total 0.04

Attractants :

0.04  
 0.03  
 0.05

**A- Mediterranean fruit fly (MFF) captured :**

- **The 1<sup>st</sup> location:** Represent relatively the low population for MFF. Table 3 indicated that the total mean of "CTD" was 0.01, 0.02, 0.07, 0.01 and 0.04 fly for Buminal 2.5%, Buminal 5%, Buminal 10%, Di-ammon.phosph. 2% and Di-ammon.phosph. 3%, respectively.

The statistical analysis of the data showed insignificant differences between Buminal 10 % and the other attractants and also there were significant differences between Di-ammonium phosph. 3 % and the other attractants, while there were insignificant differences in between Buminal 2.5 %, Buminal 5 % and Di-ammonium phosph. 2%.

- **The 2<sup>nd</sup> location:** Represent relatively the mid population for MFF. Table 3 shows that the total mean of "CTD" was 0.06 fly for Buminal 2.5%, 0.05 fly for Buminal 5%, 0.04 fly for Buminal 10%, 0.02 fly for Di-ammon.phosph. 2% and 0.06 fly for Di-ammon.phosph. 3%.

The statistical analysis of the data showed significant differences in between the five attractants.

- **The 3<sup>rd</sup> location:** Represent relatively the high population for MFF. Data presented in Table 3 showed that the total mean of "CTD" was 0.07, 0.07, 0.18, 0.12 and 0.08 fly for Buminal 2.5%, Buminal 5%, Buminal 10%, Di-ammon.phosph. 2% and Di-ammon.phosph. 3%, respectively.

The statistical analysis of the data showed insignificant differences in between the five attractants.

Summarizing the data in Table 3 it seemed that the grand mean of "CTD" for the three locations was 0.04 fly for Buminal 2.5%, 0.05 fly for Buminal 5%, 0.09 fly for Buminal 10%, 0.05 fly for Di-ammon.phosph. 2%, and 0.06 fly for Di-ammon.phosph. 3%.

The statistical analysis of the data, in Table 3 showed significant differences between Buminal 10% and the other attractants, while there were insignificant differences in between the Buminal 2.5 % and Buminal 5%, Di-ammon.phosph. 2% and Di-ammon.phosph. 3%.



Table 3. Mean capture per trap per day "CTD" of MFF in McPhail traps baited with different attractants, in citrus orchards at the three locations during the 2<sup>nd</sup> season (2/12/2003 to 13/1/2004)

Attractants	Mean of CTD of MFF during inspection periods									Grand mean		
	1 <sup>st</sup> location			2 <sup>nd</sup> location			3 <sup>rd</sup> location					
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Buminal 2.5 %	0.01	0.00	0.01 c	0.01	0.05	0.06 a	0.02	0.05	0.07 a	0.01 c	0.03 a	0.0 b
Buminal 5 %	0.00	0.02	0.02 c	0.01	0.04	0.05 a	0.02	0.05	0.07 a	0.01 c	0.04 a	0.05 b
Buminal 10 %	0.03	0.04	0.07 a	0.01	0.03	0.04 a	0.06	0.12	0.18 a	0.03 a	0.06 a	0.09 a
di-Ammonium phosphate 2 %	0.00	0.01	0.01 c	0.00	0.02	0.02 a	0.02	0.10	0.12 a	0.01 c	0.04 a	0.05 b
di-Ammonium phosphate 2 %	0.01	0.03	0.04 b	0.03	0.03	0.06 a	0.03	0.05	0.08 a	0.02 b	0.04 a	0.06 b
Mean	0.01 b	0.02 b	0.03 b	0.01 b	0.03 b	0.04 b	0.03 a	0.07 a	0.10 a	0.02	0.04	0.08

LSD values at 0.05 for :

Locations :

Male	0.01
Female	0.03
Total	0.04

Attractants :

0.01
0.04
0.04

**B- Peach fruit fly "PFF" captured :**

- **The 1<sup>st</sup> location:** Represent the low population for PFF. Table 4 shows that the total mean of "CTD" was 0.32, 0.13, 0.20, 0.05 and 0.11 fly for Buminal 2.5%, Buminal 5%, Buminal 10%, Di-ammon.phosph. 2% and Di-ammon. phosph. 3%, respectively.

The statistical analysis of the data showed significant differences between Buminal 2.5 % and Di-ammon.phosph. 2 %, while there were insignificant differences in between the four attractants, Buminal 2.5 %, Buminal 5 %, Buminal 10 % and Di-ammon.phosph. 3 %.

- **The 2<sup>nd</sup> location:** Represent the mid-population for PFF. Data in Table 4 indicated that the total mean of "CTD" was 0.67 fly, 0.33 fly, 1.18 flies, 0.20 fly and 0.46 fly for Buminal 2.5 %, Buminal 5 %, Buminal 10 %, Di-ammon.phosph. 2 % and Di-ammon.phosph. 3 %, respectively.

The statistical analysis of the data showed insignificant differences in between the five attractants.

- **The 3<sup>rd</sup> location:** Represent the high population for PFF. Table 4 shows that the total mean of "CTD" was 1.85 flies for Buminal 2.5 %, 0.75 fly for Buminal 5 %, 0.78 fly for Buminal 10 %, 0.40 fly for Di-ammon.phosph. 2 %, and 0.61 fly for Di-ammon.phosph. 3 %, respectively.

The statistical analysis showed significant differences between Buminal 2.5 % and the two attractants, Di-ammon.phosph. 2 % and Di-ammon.phosph. 3 %, while there were insignificant differences in between the four attractants, Buminal 5 %, Buminal 10%, Di-ammon.phosph. 2 % and Di-ammon.phosph. 3 %, also between Buminal 2.5% and Buminal 10 %.

Summarizing the data in Table 4 it seemed that the grand mean of "CTD" for the three locations was 0.94 fly for Buminal 2.5%, 0.40 fly for Buminal 5%, 0.72 fly for Buminal 10%, 0.22 fly for Di-ammon.phosph. 2%, and 0.40 fly for Di-ammon.phosph. 3%.

The statistical analysis of the data, in Table 4 showed significant differences between Buminal 2.5% and the other three attractants, Buminal 5%, Di-ammon.phosph. 2 % and Di-ammon.phosph. 3%, while there were insignificant differences in between the four attractants, Buminal 5%, Buminal 10%, diAmmon.phosph. 2% and Di-ammon.phosph. 3 %, also between Buminal 2.5% and Buminal 10 %.

Table 5 illustrated that, all the attractants attracted females more than males for MFF adults during the two seasons. For PFF adults, Buminal 5 % only attracted females

more than males during the 1<sup>st</sup> season, while during the 2<sup>nd</sup> season, all the attractants attracted males more than females.

From the forementioned findings, it could be concluded that all the attractants attracted MFF adults relatively equal to PFF adults during the 1<sup>st</sup> season, while during the 2<sup>nd</sup> season, all the attractants attracted PFF adults more than MFF adults.

The forementioned data are in disagreement with the findings of Hanafy *et al.* (2001), where they mentioned that Buminal as a food attractant was lower in capturing PFF adults when compared with Di-ammon.phosph. 3 %.

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Table 4. Mean capture per trap per day "CTD" of PFF in McPhail traps baited with different attractants, in citrus orchards at the three locations during the 2<sup>nd</sup> season (2/12/2003 to 13/1/2004).

Attractants	Mean of CTD of MFF during inspection periods									Grand mean		
	1 <sup>st</sup> location			2 <sup>nd</sup> location			3 <sup>rd</sup> location					
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Buminal 2.5 %	0.26	0.06	0.32 a	0.64	0.03	0.67 a	1.75	0.10	1.85 a	0.88 a	0.06 a	0.94 a
Buminal 5 %	0.12	0.01	0.13 ab	0.31	0.02	0.33 a	0.70	0.05	0.75 ab	0.37 ab	0.03 b	0.40 b
Buminal 10 %	0.18	0.02	0.20 ab	1.15	0.03	1.18 a	0.73	0.05	0.78 ab	0.69 ab	0.03 b	0.72 ab
di-Ammonium phosphate 2 %	0.04	0.01	0.05 b	0.18	0.02	0.20 a	0.37	0.03	0.40 b	0.20 b	0.02 b	0.22 b
di-Ammonium phosphate 2 %	0.09	0.02	0.11 ab	0.43	0.03	0.46 a	0.58	0.03	0.61 b	0.37 ab	0.03 b	0.40 b
Mean	0.14 b	0.02 b	0.16 b	0.54 ab	0.03 b	0.57 ab	0.83 a	0.05 a	0.88 a	0.50	0.03	0.53

LSD values at 0.05 for :

Locations :

Male	0.41
Female	0.02
Total	0.42

Attractants :

0.53
0.03
0.54

Table 5. Mean capture per trap per day "CTD" of male and female of MFF & PFF in McPhail traps baited with different attractants, in citrus orchards at Fayoum Governorate during the two successive seasons; 2002/2003 and 2003/2004.

Attractants	1st experiment (10/12/2002-21/1/2003)						2nd experiment (2/12/2003-13/1/2004)					
	MFF			PFF			MFF			PFF		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Buminal 2.5 %	-	-	-	-	-	-	0.01 c	0.03 a	0.04 b	0.88 a	0.06 a	0.94 a
Buminal 5 %	0.03 a	0.14 a	0.17 a	0.06 a	0.08 a	0.14 a	0.01 c	0.04 a	0.05 b	0.37 ab	0.03 b	0.40 b
Buminal 10 %	0.02 a	0.07 ab	0.09 ab	0.04 a	0.04 ab	0.08 b	0.03 a	0.06 a	0.09 a	0.69 ab	0.03 b	0.72 ab
di-Ammonium phosphate 2 %	-	-	-	-	-	-	0.01 c	0.04 a	0.05 b	0.20 b	0.02 b	0.22 b
di-Ammonium phosphate 2 %	0.02 a	0.03 b	0.05 b	0.03 a	0.02 b	0.05 b	0.02 b	0.04 a	0.06 b	0.37 ab	0.03 b	0.40 b
Bactrogegel 1.3 %	0.01 a	0.03 b	0.04 b	0.03 a	0.03 b	0.06 b	-	-	-	-	-	-
Mean	0.02	0.07	0.09	0.04	0.04	0.08	0.02	0.04	0.06	0.50	0.03	0.53

## REFERENCES

1. Anonymous 1985. Buminal fly attractant (lure). Fino work. H. Luithlen Sohne Gmbh and Co. KG. Nahrungsmittle Fabrikten. Koblenzer Strabe 58 Postfach 180 0-5470 Andernach-Rhein.
2. Awadallah, A. M., A. G. Hashem, and S. M. Foda. 1974. A trial for testing the sterile male technique as a mean of controlling the Medfly, *Ceratitis capitata* Wied. Egypt. Agric. Res. Rev., Egypt, 52 : 41-49.
3. El-Minshawy, A. M., M. A. Al-Eryan and A. I. Awad. 1999. Biological and morphological studies on the guava fruit fly, *Bactrocera zonata* (Saunders) (Diptera : Tephritidae) found recently in Egypt. 8<sup>th</sup> Nat. Conf. of Pests & Dis. of Veg. & Fruits in Ismailia, Egypt, 1999.
4. Hafez, M. and M. A. Ezzat. 1967. Dose the Mediterranean fruit fly, *Ceratitis capitata* (Wied.) occur in the New Valley in U.A.R. J. of Agric. Res., 45 : 97-101.
5. Hanafy, A. H. A., A. I. Awad and M. Abo-Sheasha. 2001. Field evaluation of different compounds for attracting adults of Peach Fruit Fly, *Bactrocera zonata* (Saunders) and Mediterranean Fruit fly, *Ceratitis capitata* (Wied.) (Diptera : Tephritidae) in guava orchards. J. Agric. Sci., Mansoura Univ., 26 (7) : 4537-4546.
6. Hashem, A. G., E. J. Harries, M. H. Saafan, M. H. and S. M. Foda. 1987. Control of the Mediterranean fruit fly in Egypt with complete coverage and partial bait sprays. Annals. Agric. Sci., 32 (3) : 1813-1825.
7. Kapoor, V. C. and M. L. Agaewall. 1982. Fruit flies and their increasing host plants in India. Proc. CEC/IOBC Intern. Symp. Athens/Greece, 16-19 Nov., 1982.
8. Mohammed, A. A. A. 2003. Studies on the peach fruit fly, *Bactrocera zonata* (Saunders) and its control in Fayoum governorate. M.Sc. Thesis, Fac. Agric., El-Fayoum, Cairo Univ.
9. Narayana, E. S. and H. N. Batra. 1960. Fruit flies and their control. Indian Coun. Agric. Res., pp. 1-68.
10. Nicanor, J. Liquido, Roy Teranishi and Saima Kint 1993. Increasing the efficiency of catching Mediterranean fruit fly (Diptera : Tephritidae) males in trimedlure baited traps with ammnia. J. Econ. Entomol., 86 (6) : 1700-1705.

11. Oakly, W. 1948. Manual of Foreign Plant Pests, pp. 216-217.
12. Saafan, M. H. 1986. Studies on the Mediterranean fruit fly, *Ceratitis capitata* Wied. with emphasis on sterile male technique (SIT) (Diptera : Tephritidae). Ph.D. Thesis, Fac. Agric., Cairo Univ., Egypt.
13. Saafan, M.H., S.M. Foda and A. G. Hashem, 1989. Control of th medfly, *Ceratitis capitata* Wied. using partial bait spray. 3rd Nat. Conf. of Pests & Dis. of Veg. & Fruit in Egypt and Arab Countries, Ismailia, Egypt, pp. 566-580.
14. Saafan, M. H. 2000. Integrated control of the Mediterranean fruit fly, *Ceratitis capitata* (Wied.) in apricot orchards in Egypt. Egypt. J. Agric. Res., 78 (1) : 109-120.
15. Steyskal, G. 1977. History and use of McPhail trap. Fla. Ent., 60 : 11-16.

## التقييم الحقلى لبعض الجاذبات فى جذب الحشرات الكاملة لذبابة فاكهة البحر المتوسط وذبابة ثمار الخوخ فى حدائق الموالح

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نظرا لما تلعبه الجاذبات المختلفة لذبابة الفاكهة من دور هام فى المكافحة، وأيضا فى الاستدلال على وجود الذباب، فقد تم التقييم الحقلى لجاذبات مختلفة لجذب ذبابة فاكهة البحر المتوسط وذبابة ثمار الخوخ وذلك فى سلسلة أبحاث أجريت فى حدائق المانجو والموالح والمشمش.

وهذا البحث هو الثانى ..والذى أجرى فى حدائق الموالح بمركزى سنورس وأبشواى بمحافظة

الفيوم، خلال موسمى ٢٠٠٢/٢٠٠٣، ٢٠٠٣/٢٠٠٤ كانت نتائج تقييم المواد المختبرة كالتالى :

خلال الموسم الأول (٢٠٠٢/٢٠٠٣) كان مجموع الذباب المنجذب للمصيدة الواحدة فى اليوم الواحد "CTD" بالنسبة لذبابة فاكهة البحر المتوسط هو ٠,١٧ ذبابة، ٠,٠٩ ذبابة، ٠,٠٥ ذبابة، ٠,٠٤ ذبابة، وكانت قيم "CTD" بالنسبة لذبابة الخوخ هى ٠,١٤ ذبابة، ٠,٠٨ ذبابة، ٠,٠٥ ذبابة، ٠,٠٦ ذبابة، وذلك للجاذبات : بومينال ٥ %، بومينال ١٠ %، داي أمونيوم فوسفيت ٣ %، بكتروجيل ١,٣ %، على التوالى.

خلال الموسم الثانى (٢٠٠٣/٢٠٠٤) كان مجموع الذباب المنجذب للمصيدة الواحدة فى اليوم الواحد "CTD" بالنسبة لذبابة فاكهة البحر المتوسط هو ٠,٠٤ ذبابة، ٠,٠٥ ذبابة، ٠,٠٩ ذبابة، ٠,٠٥ ذبابة، ذبابة، ٠,٠٦ ذبابة وكانت قيم "CTD" بالنسبة لذبابة الخوخ هى ٠,٩٤ ذبابة، ٠,٤٠ ذبابة، ٠,٧٢ ذبابة، ٠,٢٢ ذبابة، ٠,٤٠ ذبابة وذلك للجاذبات : بوميتال ٢,٥ %، بومينال ٥ %، بومينال ١٠ %، داي أمونيوم فوسفيت ٢ %، داي أمونيوم فوسفيت ٣ %، على التوالى.

الجاذبات المختبرة جذبت إناث ذبابة فاكهة البحر المتوسط أكثر من الذكور وذلك خلال موسمى التجربة. وبالنسبة لذبابة الخوخ وجد أن بومينال ٥ % فقط جذب الإناث أكثر من الذكور وذلك خلال الموسم الأول، وخلال الموسم الثانى الجاذبات المختبرة جذبت ذكور ذبابة الخوخ أكثر من الإناث.