



EVALUATION OF SOME WATER TRAPS FOR CONTROLLING HAIRY ROSE BEETLE ADULTS, *TROPINOTA SQUALIDA* SCOP. (COLEOPTERA: SCARABAEIDAE)

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ABSTRACT

Different coloured plastic buckets (yellow, red, blue and white), filled with water were used as traps for adults of *Tropinota squalida* Scop. in apple orchards at El-Khatatba (El-Behaira Governorate) during seasons 2005 and 2006. The general mean numbers of adults/ trap were 6.0, 8.1, 14.4 and 24.1 in 2005 and 4.7, 6.7, 10.5 and 18.7 in 2006 seasons for white, red, yellow and blue traps, respectively. The general means for trap efficiency (two seasons) were 9.8, 13.7, 23.2 and 39.3 for white, red, yellow and blue traps, respectively. Two groups of white plastic cups, group filled with blue water solution and another group filled with water were used as traps and slung in apple trees. The general mean numbers of adults/trap were 8.1 & 7.5 for blue water solution and 5.8 & 5.2 for water traps during 2005 and 2006, respectively. The general means of trap efficiency (two seasons) were 36.8 and 25.9% for the above mentioned traps, respectively.

INTRODUCTION

The hairy rose beetle, *Tropinota squalida* Scop. (Coleoptera: Scarabaeidae) attacks ornamental plants in Egypt, but its population was found to be below the economic threshold in valley lands till 1976, therefore no serious problem was foreseen (Alfieri, 1976). In recent years, its population caused great damage to various plantations and flowers of different crops especially in apple or-

chards (Ali and Ibrahim, 1988). In newly reclaimed areas, *T. squalida* beetles were attracted to wide range of plant flowers, causing considerable damage to them. The flowers of field crops, i.e. broad bean, lupine and wheat; fruit trees, i.e. apple, pear, citrus; vegetables, i.e. cabbage, radish, turnip and rocket and weeds between wild mustard and wild radish are severely attacked by this pest (Sherief *et al* 2003). Adults of *T. squalida* also feed on grape buds and young shoots, preventing or deforming growth of fruit and reducing crop yield (Ortu *et al* 2001).

Using the water traps for the control of *T. squalida* adults started to decrease slowly in the last 15 years in such areas (Sherief *et al* 2003). Traps may play an important role in suppressing the population density and reduce injuries of *T. squalida*, especially if it was distributed in the early season (Sherief *et al* 2003). Monitoring and mass trapping of insect populations using traps could have a key role in integrated pest management programmes (Adverson *et al* 1977 and Campion, 1976).

Aim of the present work is to evaluate the effectiveness of water traps of different colours for the control of *T. squalida* adults in apple orchards during the flowering season.

MATERIALS AND METHODS

Two experiments were carried out at El-Khatatba (El-Behaira Governorate) in apple orchard of private sector during two successive flowering seasons, 2005 and 2006. The first experiment was concerned with studying the efficiency of different colours of buckets for trapping

T. squalida adults. The second was to evaluate the effect of water colour on attracting *T. squalida* adults.

1. Colours of plastic buckets

Yellow, blue, red and white of plastic buckets measuring 43 cm in diameter and 12 cm in height were filled with clear water and randomly distributed under apple trees. Sixty coloured buckets/feddan were used, each colour contains 15 traps. On weekly bases, the buckets were investigated and the number of trapped *T. squalida* was counted throughout the period extended from February till the end of March.

2. White plastic cups

Two groups of white plastic cups measuring 12 cm in diameter and 8 cm in height were slung in apple orchards as traps for adults (one cup/ tree). The first group (45 cups) filled with clear water and the second group (45 cups) filled with blue coloured water by adding copper sulphate to water. Cups were randomly distributed. *T. squalida* adults were collected weekly and counted. The efficiency of the traps was estimated by using the following formula:

$$\% \text{ Trap efficiency} = \frac{A}{B + C} \times 100$$

A: Mean No. of adults in each trap

B: Total mean No. of adults caught in all traps

C: Mean No. of adults not

RESULTS AND DISCUSSION

1. Coloured plastic buckets filled with water

As shown in Table (1), the mean number of caught *T. squalida* in the first season (2005) was highly significantly higher than caught in the second season (2006). This was common for any colour of experimental buckets. Means of 14.4, 8.1, 24.1 and 6.0 adults/ trap in the first season and 10.5, 6.7, 18.7 and 4.7 adults/ trap in the second season were recorded after using yellow, red, blue and white traps, respectively. This means that the most attractive colour for *T. squalida* adults were blue, followed by yellow and red colours. White coloured traps were less attractive for this insect, as the least number of adults were caught. This was common in both experimental years.

The population of *T. squalida* adults caught in different coloured buckets traps filled with water was weekly counted from the beginning of February till the end of March in the apple orchard. Generally the population started at low level, gradually increased to reach the maximum number in the first week of March of both experimentally years, then the population gradually decreased to reach the minimum at the end of season, i.e., in the fourth week in the March.

Maximum mean numbers of 44.9, 26.1, 15.5 and 12.1 adults/trap on March 4, 2005 and 32.7, 19.2, 13.3 and 8.9 adults/trap on March 3, 2006 were recorded in blue, yellow, red and white traps, respectively.

Statistical analysis showed a highly significant difference between the four coloured traps during 2005 and 2006. The best colour trap for attracting the adults of *T. squalida* was the blue followed by yellow traps. Results are in agreement with the findings of El-Deeb (1992); Ali (1993); Hydar *et al* (1993) and Sherief *et al* (2004) who found that the blue water traps attracted considerable numbers of *T. squalida* adults than the other tested colours. Schmera *et al* (2004) found that adults of *Epicomis hirta* (Scarabaeidae) were attracted to yellow, white or light blue colours with no significant differences between colours.

From the present results, it could be concluded that the use of such colours in trapping system is a safe method for controlling adults of *T. squalida* in the apple orchards in Egypt.

2. White plastic cups

Data in Table (2) showed that the minimum and maximum mean numbers of *T. squalida* adults/ trap were 3.5 & 13.1 and 2.6 & 12.2 for white cups filled with blue water solution and those filled with water only, respectively during season, 2005. The general mean numbers of adults/trap were 8.1 and 5.8 for the above mentioned traps, respectively.

On the other hand, during season 2006, the lower and highly means numbers of adults/ trap were 2.8 & 12.8 and 2.1 & 11.6 for white cups filled with blue water solution and water, respectively. The general means numbers of adults/ trap were 7.5 and 5.2 for white plastic cups filled with blue water solution and water, respectively. The statistical analysis showed a highly significant difference between the two traps.

Table 1. Effect of coloured bucket traps filled with water for attracting adults of *T. squalida* in apple orchards at EL-khatatba, EL-Behaira Governorate (Means \pm S.D.)

Date	2005				Average	Date	2006				Average
	Mean no. of adults / trap						Mean no. of adults / trap				
	Yellow	Red	Blue	White			Yellow	Red	Blue	White	
4/2	7.0	4.5	11.0	3.4	6.4	3/2	4.5	3.0	9.6	1.7	4.7
11/2	9.1	6.7	16.1	4.3	9.1	10/2	7.3	4.8	12.5	3.7	7.1
18/2	16.9	8.6	24.8	7.3	14.4	17/2	12.1	6.8	18.6	5.8	10.8
26/2	21.3	7.7	32.5	6.5	17.0	24/2	15.3	6.5	25.5	5.4	13.2
4/3	26.1	15.5	44.9	12.1	24.7	3/3	19.2	13.3	32.7	8.9	18.5
11/3	16.0	10.1	32.3	7.5	16.5	10/3	12.1	9.9	26.4	5.9	13.6
18/3	11.5	7.1	21.5	4.2	11.1	17/3	8.9	6.1	16.1	3.9	8.8
25/3	7.1	4.2	9.8	2.8	6.0	24/3	4.6	3.3	8.2	2.3	4.6
Total	115.0	64.4	192.9	48.1	105.2	Total	84.0	53.7	149.6	37.6	81.3
Mean \pm S. D.	14.4 \pm 5.8	8.1 \pm 3.5	24.1 \pm 8.7	6.0 \pm 2.6	13.2 \pm 5.2	Mean \pm S. D.	10.5 \pm 5.1	6.7 \pm 3.1	18.7 \pm 7.5	4.7 \pm 2.5	10.2 \pm 4.5

F value 7.43**
L.s.d. 2.06

F value 4.65**
L.s.d. 1.75

Table 2. Effect of white plastic cups filled with blue water solution and water for controlling adults of *T. squalida* in apple trees at EL-khatatba, EL-Behaira Governorate (Means \pm S.D.)

Date	2005		Average	Date	2006		Average
	Mean no. of adults / trap				Mean no. of adults / trap		
	blue water solution	Water			blue water solution	water	
4/2	4.6	2.6	3.6	3/2	4.2	2.1	3.2
11/2	6.8	3.3	5.1	10/2	6.2	2.5	4.4
18/2	9.2	5.4	7.3	17/2	8.4	4.6	6.5
26/2	9.6	5.8	7.7	24/2	9.2	5.1	7.2
4/3	13.1	12.2	12.7	3/3	12.8	11.6	12.2
11/3	11.2	8.6	9.9	10/3	10.2	8.1	9.2
18/3	6.7	5.3	6.0	17/3	6.2	5.1	5.7
25/3	3.5	3.1	3.3	24/3	2.8	2.5	2.7
Total ¹	64.7	46.3	55.6	Total	60.0	41.6	51.1
Mean± S.D.	8.1 ± 5.4	5.8 ± 4.3	7.0±4.4	Mean± S.D.	7.5 ± 4.9	5.2 ± 3.9	6.4±4.4

F value 5.16**
L.s.d. 0.79

F value 5.28**
L.s.d. 0.76

Table 3. Traps efficiency Percentages used for controlling adults of *T. squalida* in apple orchards at EL-khatatba , EL-Behaira Governorate.

Year	Mean no. of adults / tree	Total mean no. of adults caught in all traps	% Trap efficiency				Total mean no. of adults caught in all traps	% Trap efficiency	
			yellow	red	blue	white		blue water solution	water
2005	9.7	52.6	23.1	13.0	38.7	9.6	13.9	34.3	24.6
2006	6.4	40.6	22.3	14.3	39.8	10.0	12.7	39.3	27.2
Total	16.1	93.2	46.4	27.3	78.5	19.6	26.6	73.6	51.8
Mean	8.1	46.6	23.2	13.7	39.3	9.8	13.3	36.8	25.9

The efficiency of blue coloured buckets was highly effective for the attraction of *T. squalida* adults giving 38.7 and 39.8% in 2005 and 2006 flowering seasons, respectively. This was followed by the use of yellow traps 23.1 and 22.3% during 2005 and 2006, respectively. Meanwhile, efficiency for red and white traps recorded 13.0 & 14.3% and 9.6% 10.0% during 2005 and 2006, respectively. The general means of trap efficiency for the two seasons were 9.8, 13.7, 23.2 and 39.3% for white, red, yellow and blue traps, respectively. Sherief *et al* (2003) found that the efficiency of blue pan water and blue funnel traps were 72.48 and 13.44% (apple), 58.08%, 22.37% (pear), 83.73 and 4.48% (navel orange) and 86.84 and 5.98% (strawberry), respectively.

Data presented in Table (3) pointed that the trap efficiency values were 34.3 & 39.3% for white plastic cups filled with blue water solution and 24.6 & 27.2 for white cups filled with water during 2005 and 2006, respectively. The general means of trap efficiency for two seasons were 36.8 and 25.9% for the above mentioned traps, respectively.

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تقييم بعض المصايد المائية لمكافحة الحشرات الكاملة لجعل الورد الزغبى

[٤٥]

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قسمت إلى مجموعتين ، الأولى احتوت على محلول مائى أزرق ، أما المجموعة الثانية فقد احتوت على ماء عادى . وقد وجد أن متوسط الحشرات الكاملة فى المصيدة الواحدة كان: ٨,١,٧,٥ حشرة / مصيدة للمصايد المحتوية على محلول مائى أزرق و المحتوية على ماء عادى على الترتيب خلال موسم ٢٠٠٥ . وكانت ٥,٢, ٥,٨, ٥ حشرة / مصيدة للمصايد المحتوية على محلول مائى أزرق و المحتوية على ماء عادى خلال موسم ٢٠٠٦ على الترتيب.

استخدمت فى هذه الدراسة الاطباق البلاستيكية الملونة (اصفر ، احمر ، ازرق ، ابيض) كمصايد مائية للحشرات الكاملة لجعل الورد الزغبى حيث وضعت بين أشجار التفاح فى حديقة تفاح تابعة للقطاع الخاص بمنطقة الخطاطبة خلال موسمى ٢٠٠٥، ٢٠٠٦ . وقد وجد أن متوسط الحشرات المنجذبة الى المصايد خلال الموسمين كان ٩,٨, ١٣,٧، ٢٣,٢، ٣٩,٣ حشرة / مصيدة للمصايد ذات اللون الابيض، الاحمر، الاصفر، الازرق على الترتيب . استخدمت ايضا علب بلاستيكية بيضاء