

DISTRIBUTION OF HAIRY ROSE BEETLE, *Tropinota squalida* SCOP. (COLEOPTERA: SCARABAEIDAE) ON ORANGE TREES

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ABSTRACT

The hairy rose beetle, *Tropinota squalida* Scop. (Coleoptera: Coccinellidae) is one of the most serious pests of several different crops. Orange crop which infesting by this pest is a delicious and popular fruit in Egypt as well as it has a great nutritional value. Occurrence and distribution of this pest on orange trees (*Citrus sinensis*) were studied throughout two seasons (2002 and 2003). Results proved the beetles preferred the southern sites of the orange trees than that other three geographical directions. On the other hand, the least numbers of this pest were observed on the western sides of trees.

Also, sunny sides of the orange trees harboured more individuals of this pest than shady ones not only in the morning but also at afternoon.

INTRODUCTION

Hairy rose beetle, *Tropinota squalida* Scop. (Coleoptera: Scarabaeidae) is considered as one of the most important agricultural insect pests. However, adults of this insect attack and injury several crops, such as citrus, peach, pear, and apple as fruits (Jannone, 1947). Guennelon (1959), Ali and Ibrahim (1988) and Sherif (1992). Also different aromatic and ornamental plants suffered from this dangerous pest (Novak 1928, Ali & Ibrahim (1988) Hydar *et al.*, (1993) Mohisen *et al.*, (2000) and Ortu *et al.*, (2001).

Sweet orange, *Citrus sinensis* is considered as one of the delicious and popular fruit in Egypt, besides, it has a great nutritional and medicinal values. So, it is very important to control insect pests attacking orange trees such as *T. squalida*. Knowledge about distribution of this pest on orange trees may be useful in control procedures. Therefore, the present study aims to achieve this objective.

MATERIALS AND METHODS

This study was conducted and carried out at Horticulture farm of Agriculture Faculty, Al-Azhar University at Nasr City. The work continued for two successive seasons (2002 and 2003 seasons). Two experiments were carried out; the first aimed to studying the effect of cardinal directions on the beetls distribution, while the second experiment was planned in order to know the influence of both sunny and shady sides of the tree on the insect distribution.

1. Effect of cardinal directions:

Ten trees of sweet orange (*Citrus sinensis*) were chosen randomly. Each tree was theoretically divided into 4 equal sections; northern (N), southern (S), Eastern (E) and western (W).

Adults of *T. squalita* were directly counted week by week on each of the four mentioned sides of the tree. Samples were taken at mid-day. Data were statistically analysed by using Duncan multiplery test in SAS (1998).

2. Effect of Sunny and Shady Positions:

In this experiment, also 10 trees were selected randomly. Each tree was divided into 2 sections. One of them was facing the sun rays (Sunny side), while the other was not facing the sun rays (shady side). Beetles were directly counted on both sides of the tree. Samples were taken twice/day; in the morning (8-9a.m) and at afternoon (3-4p.m). Obtained data were statistically analysed by the previously mentioned statistical analysis.

RESULTS AND DISCUSSION

Data presented in table (1) show that adults of *Tropinota squalida* preferred certain geographical directions than others. However, the largest numbers of adults (296 beetles/10 trees) with a percentage of 39.2% of the total catch) was recorded at southern sector of tree during the 1st season. The second preferred direction for the insect was the east (200 beetles/10 trees with a percentage of 26.5). The northern site of tree came in the third rank. In the contrary, the western sector of orange tree was the least preferred direction for this insect, where beetles were in the lowest numbers (99 beetles/10 trees with a percentage of 13.1% of the total seasonal catch)

Table(1): Weekly mean number of *Tropinota squalida* adults at different horizontal directions of orange trees during the 1st season (2002)

Inspection date	Numbers of adults/1 tree			
	North	South	East	West
Feb. 19/2002	0.1	0	0	0
26/2002	0.2	0	0	0
Mar. 5/2002	1.8	3.8	2.2	1.3
12/2002	2.5	4.2	2.7	1.8
19/2002	2.9	5.4	3.5	1.6
26/2002	3.1	5.7	4.0	2.2
Apr. 2/2002	2.3	4.1	2.8	1.5
9/2002	1.6	2.8	2.1	0.7
16/2002	0.9	1.8	1.2	0.7
23/2002	0.7	1.5	1.3	0.1
2002	0.0	0.3	0.2	0.0
Mean ± S.E.	1.46±0.35 * (b)	2.69±0.63 (a)	1.82±0.42 (b)	0.90±0.25 (c)
Total numbers per 10 trees	161	296	200	99
%	21.3	39.2	26.5	13.1

*Means with the same letter are not significantly different using Duncan multiplicity test in SAS (1998)

Same trends were achieved in the second season (2003). As shown in table (2). The southern side of the tree harboured the highest number of beetles (260 beetles/10 trees with a percentage of 44.6% of the total insect catch). As noticed in 1st season, the lowest numbers of adults were attracted to the western position of the tree (65 adults/10 trees with as percentage of 11.1%). The eastern and northern sites of the trees attracted 145 and 113 beetles with a percentage of 24.9% and 19.4% respectively. Statistical

analysis proved that adults of *T. squalida* preferred southern side of the orange tree than the three other sides of the tree, whereas its highest numbers were observed on this direction during the two successive seasons. Preference of this insect to this direction may be due to that southern position is considered warmer than other positions. Similar results were obtained by Sherif (1992) on peach tree when he used water trap to collect adult of this species. As a consequence, it is necessary to concentrate control procedures against pest towards its preferred direction. Also planting wild flowering flora or parasitic flowering plants at this direction may attract this pest a way from orange trees El-Husseini *et al* (2001) Al-Khesraji *et al.*, (1987).

Table (2): Weekly mean number of *Tropinota squalida* adults at different horizontal directions of orange trees during the 2nd season (2003)

Inspection date	Numbers of adults/1 tree			
	North	South	East	West
Feb. 26/2003	1.0	2.5	1.5	0.6
Mar. 5/2003	1.5	3.2	1.8	0.9
12/2003	1.3	4.6	2.5	0.9
19/2003	2.2	5.1	2.5	1.0
26/2003	1.7	4.0	2.5	1.3
Apr. 2/2003	1.6	2.6	1.3	1.0
9/2003	0.8	1.7	1.1	0.6
16/2003	0.8	1.6	0.9	0.2
23/2003	0.4	0.7	0.4	0.0
Mean ± S.E.	1.26±0.19 * (b)	2.89±0.49 (a)	1.61±0.26 (b)	0.72±0.14 (c)
Total numbers per 10 trees	113	260	145	65
%	19.4	44.6	24.9	11.1

*Means with the same letter are not significantly difference using Duncan multiplicity test in SAS (1998)

3. Distribution of beetles on the sunny and shady sides of the tree:

Data presented in table (3) show the mean numbers of *T. squalida* adults recorded in the morning on both sunny and shady sides of citrus trees during the two successive season of study. No doubt, that the beetles showed preference towards the sunny positions of the trees in the morning than towards other ones throughout the two seasons. The total collected beetles were 349 and 131 beetles on the sunny and shady sides of the tree respectively in the 1st season. However, they were 294 and 92 beetles, respectively in the 2nd season. Same results were obtained in the period of afternoon (3-4. p.m.).

In a word, sunny side of the tree harboured more numbers of beetles than other one (table 4). However, the total collected numbers of adults on sunny side were 307 and 271/10 trees during the 1st and 2nd seasons, respectively, compared to 97 and 108 beetles recorded on shady sides during the 1st and 2nd seasons, respectively. The formentioned results greatly correspond with those. Ali and Ibrahim (1988) and are in agreement with results of Tadrous *et al.* (2001) who stated that beetles were active during day time especially on sunny warm early spring days.

Table (3): Weekly mean numbers of *T. squalida* adults recorded on both sunny and shady sides of orange trees in the morning during 2002 and 2003 seasons

Inspection date	Mean numbers of adults/1 tree					
	2002 season			2003 season		
	S	Sh	Range	S	Sh	Range
Feb. 19	1.7	0.9	0.8	1.1	0.4	0.7
26	2.5	0.6	1.9	2.7	0.8	1.9
Mar. 5	3.4	1.5	1.9	3.9	1.2	2.7
12	5.6	2.0	3.6	7.1	2.1	5.0
19	5.0	1.8	3.2	7.6	2.0	5.6
26	6.8	2.5	4.3	4.3	1.3	3.0
Apr. 2	5.4	2.1	3.3	1.8	1.0	0.8
9	3.0	1.2	1.8	0.7	0.2	0.5
16	1.5	0.5	1.0	0.2	0.2	0.0
Mean ± S.E.	13.880 +0.63 * (a)	1.46 ± 0.23 (b)		3.27 ± 0.90 (a)	1.02 ± 0.24 (b)	
Total numbers per 10 trees	349	131		294	92	

*Means with the same letter are not significantly difference using Duncan multiplery test in SAS (1998)

S. : Sunny side

Sh : Shady side.

Table (4): Weekly number of *T. squalida* adults recorded on both sunny and shady sides of orange trees in the afternoon during 2002 and 2003 seasons

Inspection date	Mean numbers of adults/1 tree					
	2002			2003		
	S	Sh	Range	S	Sh	Range
Feb. 19	0	0	0	0.9	0.5	0.4
26	2.7	0.7	2.0	2.0	1.0	1.0
Mar. 5	3.7	1.4	2.3	4.3	1.1	3.2
12	5.6	1.2	4.4	6.3	2.0	4.3
19	5.4	1.7	3.7	7.3	2.4	4.9
26	4.9	1.7	3.2	3.3	1.5	1.8
Apr. 2	3.3	1.0	2.3	1.4	0.7	0.7
9	2.3	1.0	1.3	1.2	0.6	0.6
16	1.6	0.5	1.1	0.4	0.6	-0.2
23	1.2	0.5	0.7	0	0	0
Mean ± S.E.	3.41 ±0.54 * (a)	1.08 ±0.15 (b)		3.01 ± 0.83 (a)	1.16 ± 0.23 (b)	
Total numbers per 10 trees	307	97		271	108	

*Means with the same letter are not significantly difference using Duncan multiplery test in SAS (1998)

S. : Sunny side

Sh : Shady side.

Data presented in tables (3,4) show that the range between adult numbers at sunny and shady sites increased during the maximal activity period, while it decreased at the beginning and the end of adult occurrence.

Finally, it is obvious that adults of this pest preferred sunny side of trees than other side; either in the morning or at afternoon. Also, it is clear, that southern direction of tree harboured the greatest numbers of this insect than other directions. Therefore it is necessary to fix control procedures on these positions in order to control this pest successfully.

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توزيع جعل الورد الزغبى (رتبة غمدية الأجنحة) على أشجار البرتقال

إبراهيم لبيب إبراهيم

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تصاب أشجار البرتقال في مصر خاصة أثناء موسم الأزهار بأفة جعل الورد الزغبى مما يؤدي إلى تدمير البراعم الزهرية والقضاء على الأزهار وينشأ عن ذلك نقص واضح في الإنتاج ونظراً لما تتمتع به فاكهة البرتقال من أهمية اقتصادية حيث أنه سلعة تصديرية بجانب أنه فاكهة شعبية تستهلك محلياً لذلك أجريت هذه الدراسات لتحديد كيفية توزيع هذه الآفة على أشجار تمهيداً لاختيار أنسب الأساليب لمكافحتها.

ووجد من الدراسة التي أجريت على مدى موسمية كاملين ومنتسابعين (٢٠٠٢، ٢٠٠٣) بمزرعة كلية الزراعة - جامعة الأزهر أن الحشرات البالغة لجعل الورد الزغبى تفضيل الجهات الجنوبية لأشجار البرتقال عن الجهات الجغرافية الثلاث الأخرى - وكانت الجهة الغربية للأشجار أقل الجهات جذباً لهذه الحشرة.

كذلك كشفت الدراسة عن أن الجوانب المشمسة من أشجار البرتقال كانت أكثر جذباً لحشرات الجعل من الجوانب الظليلة من الأشجار سواء كان ذلك في فترة الصباح أو في فترة ما بعد الظهيرة.