

***Rhynchophorous ferrugineus* Olivier**  
**(Coleoptera: Curculionidae)**

(1)

*Rhynchophorus ferrugineus* Olivier (Coleoptera Curculionidae)

: 700 400 200  
 4-Methyl-5- Nonanol 90% + 4-Methyl-5-Nonanon 10%

700  
 700 ) 200  
 229 274 216 169 ( )  
 534 354 888

- ) -  
 ( : ) ( - ) - ( )  
 1.51 :1  
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*Rhynchophorous ferrugineus* :

# Control of the Red Palm Weevil *Rhynchophorus ferrugineus* Olivier (Coleoptera: Curculionidae) using aggregation pheromones

Ahmed Hussein Al-Saoud<sup>(1)</sup>

## ABSTRACT

Red palm weevil *Rhynchophorus ferrugineus* Olivier (Coleoptera: Curculionidae) is one of the most important insects attacking date palms in many date palm growing areas world-wide. Aggregation pheromone traps were used in one date farm at Al-Khatem region in the United Arab Emirates and gave good results. Traps captured large numbers of weevils throughout the year and prevented it spread into new areas. They also reduced its numbers in the infested areas, helped locating infested spots, and determined insect periods of activity and sex ratio during the year. Such information is helpful in preparing plans and programs to control the red palm weevil and evaluating its control operations. It is known that pheromones do not cause any damage to the environment, humans, and animals and using them for insect control is quite easy and inexpensive on the long run. Results of this study demonstrated the effectiveness of the concentrations: 200, 400, 700 mg of the pheromone 4- Methyl-5-Nonanol 90% + 4-Methyl-5-Nonanol 10%. This can put the pest under economic threshold after period of use this method. The concentration 700 mg had significantly better catch than 200 mg, however no significant differences were observed between the other treatments and the control. The numbers of collected insects were 169, 216, 258, and 245 for the three concentrations and the control, respectively. The total number of collected insects was 888 (354 males and 534 females) in one year. Red palm weevil does not enter diapause and it is found throughout the whole year in the date palm farms. The largest number of insects caught occurred in two periods. The first period was from September until November and the second was from March until May. The red palm weevil sex ratio (males: females) varied between months and it was 1:1.51 for the total number of insects caught during one year. The effectiveness of pheromone traps can be affected by several important factors (pheromone, pheromone concentration, time of use, bait, pheromone changing time, bait changing time, presence of water in the trap, infestation severity in the farm, trap distribution in the farm, and trap maintenance).

**Keywords:** Red palm weevil, *Rhynchophorus ferrugineus* control, aggregation pheromone.

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*Rhynchophorous ferreuginous* Olivier

(Coleoptera: Curculionidae)

Sharif, Wajih, 1983, Frohlich )

2002

1999

1993

Rodewaid, 1970

( -2004

2002

( 2004)

(1969) Lever

( )

500-200

(1969) Lever

(1999)

300-200

(1983) Wajih

Sharif

300

(2000) Falerio

/ 208

Vidhyasagar (1999)

Abraham

(2000)

Abraham

2.86-1 2.35:1, 3.06-1

( : )

(1999)

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(1912) Ghosh

(2002)

(2004)

Khalifa

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(1999) Abraham ( )

- 1995 ( - ) -  
( ) 1996 ( ) ( - )  
(2000) Vidhyasagar 1997 ( )

(1998) Abraham

( 2004) (1998) Faleiro

Abozuhairrah Bokhari

(2002)

(1992)

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(1995) Oehlschlager (1993) Chinchilla

	<i>Rhynchophorus palmarum</i>	20000
1993-1990		3300
	(1995) Oehlschlagr	
	90%	<i>Rhynchophorous palmarium</i> L.
		(1998) Anonymus
		1994 31.53%
		1997 19.53%
	(1999) Muralidharan	
(2003)	Faleiro	75%
Abraham	(2000) Vidhyasagar	(2000)
6.6%		
	1997 2.5%	1993
	( 2004)	
	( )	
	(2003) Starkar Falerio	15
700		

12

( 700 )  
( 700 400 200 )  
( )

(4-Methyl- 5- Nonanol.90%+4-Methyl-5-Nonanon.10%)

8-6

( )

20

4

3×8

25

26-24

8-6

16

3

200

5-4

444

2004/7/4

2003/6/29

)

20-1

80

5-3

50

60-50

)

(

( )

25-20 ( )

*Rhynchophorus ferrugineus*

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(1)

888

*Rhynchophorus ferrugineus* Olivier

444

12

(1)

- 2003 ( )

.2004 ( )

:				
1.33 : 1	98	56	42	2003 ( )
1.56 : 1	64	39	25	( )
1.55 : 1	130	79	51	( )
1.44 : 1	93	55	38	( )
2.00 : 1	63	42	21	( )
1.65 : 1	45	28	17	( )
2.20 : 1	16	11	5	2004( )
1.14 : 1	30	16	14	( )
1.20 : 1	123	67	56	( )
1.49 : 1	102	61	41	( )
1.73 : 1	71	45	26	( )
1.94 : 1	53	35	18	( )
1.51 : 1	888	534	354	
	74	44.5	29.5	
	36	21.6	15.8	SD
	10.3	6.2	4.5	SE-+

( )

(1999)

Muralidhan

( -2004)

(2003)

Faleiro

12

53, 71, 102, 123, 30, 16, 45, 63, 93, 130, 64, 98

2004 ( )  
(2002)

2003 ( )  
(1912) Ghosh

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(2004) Khalifa

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Abraham

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1995 ( - )  
1996 ( )

1997

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(1) : -2

534 354

1.51:1 ( : )

(1999) Abraham

2.86:1

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1.94:1,1.73:1,1.49:1,1.20:1,1.14:1,2.20:1,1.65:1,2.00:1,1.44:1,1.55:1,1.56:1,1.33:1

2.2:1

2.20:1 1.14:1

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2:1 ( )

(1999) Abraham

3.06:1 2.35:1

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(2)

( 700 )

229 274

161

97

( ) (1.39:1) 133 96  
 (1.66 : 1) :  
 ( 700)  
 700 400 200 229, 274 ,216 ,169  
 700  
 200 ( )  
 700  
 200  
 700  
 200  
 .%5  
 (2)

2003 ( ) 12 *Rhynchophorus ferrugineus* Oliv.  
 444  
 .2004 ( )

	( )		( )
169	31	25.3	200
216	43.5	28.3	400
274	53.7	32.3	700
229	44.3	32	(700)
	43.8	29.5	
	10	7.4	SD±
	3.1	2.1	SE±
65.3	21.6	12.2	%5

1.39:1, 1.66:1, 1.54:1, 1.22:1 ( : )

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**4**

(3)

*Rhynchophorus ferrugineus* Oliv.

(3)

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444

12

.2004 ( )

-2003

:				
1.44 : 1	122	72	50	
1.70 : 1	73	46	27	
1.63 : 1	92	57	35	
1.71 : 1	84	53	31	
2.00 : 1	54	36	18	
1.10 : 1	60	31	29	
1.30 : 1	62	35	27	
1.13 : 1	83	44	39	
1.18 : 1	74	40	34	
3.54 : 1	49	38	11	
1.52 : 1	53	32	21	
1.56 : 1	82	50	32	
1.51 : 1	888	534	354	
	74	44.5	29.5	
	20.5	12	10	SD±
	5.6	3.4	2.6	SE±

53, 62, 73, 74, 82, 83, 84, 92, 122

49

3.54:1 1.10:1

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	.	:	<b>5</b>
4	89		
	4	12	
		16	
	( )	:	<b>7</b>

(2003) Starkar Falerio  
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( )<sup>45</sup>

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## REFERENCES

- .2002 .  
*Rhynchophorus ferrugineus* Oliv. (Curculionidae: Coleoptera)  
 .2002/10/23-14  
 . 2004 .  
*Rhynchophorus ferrugineus* (Olivier) (Coleoptera: Curculionidae)  
 30-  
 2004 ( ) 28  
 . 2004 .  
*Rhynchophorus ferrugineus* Olivier ( Coleoptera : Curculionida)  
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 .45-40 .2004( ) .( )  
 . 2004 .  
*Rhynchophorus ferrugineus* Olivier ( Coleoptera: Curculionidae)  
 .42-40 :2004  
 .1993 .  
 ( )  
 .2002 .  
 2002 ( ) 17-15  
*Rhynchophorus ferrugineus* Olivier ( .1999.  
 Coleoptera: Curculionidae)  
 .1999/12/8-11/27  
 AAbraham, V. A., Al Shuaibi, M. A.; Faleiro, J. R.; Abozuhairah, R.A. and Vidyasagar, P. S. P. V. 1998. An integrated management approach for red palm weevil, *Rhynchophorus ferrugineus* Oliv. A key pest of date palm in the Middle East. *Agricultural Sci.* 3: 77-83.  
 Abraham, V.A.; Faleiro, J.R.; Prem- Kumar. T. and M. A. A.; Shuaibi. 1999. Sex ratio of Weevil *Rhynchophorus ferrugineus* Oliv. Captured from date plantations of Saudi Arabia using pheromone (ferrolure)traps. *Indian. J. Entomol.*( India) . June 1999.Vol. 61(2) : 201-204.  
 Abraham, V. A., Faleiro, J.R., Al-Shuaibi, M.A. and Prem Kumar, T. 2000. A strategy to manage red palm weevil *Rhynchophorus ferruginous* Oliv. In date palm *Phoenix dactylifera*. Its successful implementation in Al-Hassa, Kingdom of Saudi Arabia. *Pestology*, 24(12): 23-30.  
 Anonymous, 1998. Final report of the Indian Technical Team (Part A), Red palm weevil control project, Ministry of Agriculture and Waater, Kingdom of saudi Arabia, pp 1-65.

- Bokhari, U. G. and Abozuhairah, R. A. 1992. Diagnostic tests for red palm weevil. *Rhynchophorus ferrugineus* infestd date palm trees. *Arab Gulf J. Science. Res.* 10(3) : 93-104
- Chinchilla, C.M., A.C. Oehlschager and L.M. Gonzalez. 1993. Management of Red Ring Disease in Oil Palm through pheromone-based trapping of *Rhynchophorus palmarum* (L.) Palm Oil Research Institute of Malaysia International Palm Oil Congress, Kuala Lumpur, Malaysia, September.
- Falerio, J. R., 2000. Investigation of the role of pheromon trapping in the suppression of red palm weevil *Rhynchophorus ferrugineus* Oliv. Population in Coconut plantations, International Conference on Managing Natural Resources for Sustainable Agricultural Productio in the 21<sup>st</sup> Century, New Delhi, India Feb. 14-18, 2000, pp 1338-1339.
- Faleiro, J. R., Abraham, V. A. and Al- Shuaibi, M. A. 1998. Role of pheromone trapping in the management of Red Palm Weevik. *Indi. Coc. J.* 29(5):1-3.
- Faleiro, j. R., Rangnekar, P. a. and Satarkar, V. R. 2003. Age and fecundity of female red palm weevils *Rhynchophorus ferrugineus* (Olivier) (Coleoptera:Rhynchophoridae) captured by pheromone traps in coconut plantations of India. *Crop Protection*, 22: 999-1002.
- Falerio, J. R. and Sataekar, V. R. 2003. Diurnal activity of red palm weevil, *Rhynchophorus ferrugineus* Olivier in Cocount plantation of Goa. *Insect Environment*, 9(2): 63-64.
- Frohlich, G. and J. W. Rodewald. 1970. Pests and diseases of tropical Crops and their Control. Oxford, New York. Pp: 204-207.
- Ghosh, C. C. 1912. Life- Histories of Indian Insects-III, The Rhinoceros Beetle *Oryctes rhinoceros* and the Red Palm Weevil *Rhynchophorus ferrugineus*. Memoirs of the Dept. Agr. India. *Ent. Ser.* II (10) : 205-217.
- Khalifa, O., El Assal, A. H., El Ezaby, F. A., Murse, M. A., Al- Nuaimi, S. M. and N. S. Al Zehli. 2004. Integrated pest management for the control of red weevil (*Rhynchophorus ferrugineus* Oliv.) in the eastern region, Al Ain, UAE. Date Palm Regional Workshop on Ecosystem based IPM. For Date Palm in the Gulf Countries. Al-Ain-UAE. University 28-30March 2004.
- Lever, R. J. V. W. 1969. Pests of Coconut Palm. FAO. Agricultural Studies, Rome, 113-119.
- Muralidharan, C. M., U. R. Vagjasia and N. N. Sodagar. 1999. Population, food preference and trapping using aggregation pheromone of the red palm weevil *Rhynchophorus ferrugineus*. *Indian J. Agric. Sci.* 69: 602-604.
- Oehlschlager, A. C., Mc Donald, R. S., Chinchilla, C. M. and S. N. Patschke. 1995. Influence of pheromone based mass trapping system on the distribution of *Rhynchophorus palmarum*(Coleoptea: curculionidae) in oil palm. *Environ Entomol.* 24(5) : 1005-1012.
- Sharif, M. and I. wajih. 1983. Date palm pests and diseases in Pakistan. The first symposium in the date palm. King faisal University, Al-hassa, Kingdom of Saudi Arabia, pp: 440-451.
- Vidhyasagar, P. S. P. V., Al- Saihati, A. A., Al- Mohanna, O.E., Subbei, A. I. And Abdul Mohsin, A. M. 2000. Management of Red Palm Weevil *Rhynchophorus ferrugineus* Olivier. A serious pest of date palm in Al- Qatif, Kingdom of Saudi Arabia. *Journal of Plantation Crops*, 28(1): 35-43.

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