

*Meriones libycus*

(3) (2) (1)

2005

*Meriones libycus*

(%2

2

)

)

.(%56

3

)

(%0.005

10

%18.5 %81.9 %91.9 %95.9

24

10

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30621 . .

(2)

(1)

113 . .

(3)

## Field Performance of Three Rodenticides in Controlling the Libyan Jird *Meriones libycus* in Syria

Ibrahim Mam Khair<sup>(1)</sup>, Fauzi Samara<sup>(2)</sup>  
and Adwan Shehab<sup>(3)</sup>

### ABSTRACT

Field trails were conducted in February, 2005 to evaluate the field performance of three rodenticides in controlling colonies of the Libyan Jird, *Meriones libycus* at semi arid lands east to Damascus and Homs cities. 2% Zinc Phosphide wheat baits, 0.005% Brodifacoum ready to use baits and Aluminum Phosphide (Fumigant) were tested. The active burrows were treated by inserting ten grams of the poisoned baits or by one tablet (3g) of Aluminum Phosphide.

The efficacy of treatments was calculated depending on the number of active burrows before and after treatment. Obvious reduction in burrowing activity was registered in Zinc Phosphide, Brodifacoum, Aluminum Phosphide treatments; 95.9%, 91.9% and 81.9% respectively, in comparison to 18.5% in the untreated control. The difference between Zinc Phosphide and Aluminum Phosphide efficacy was not significant, while it was significant between these two rodenticides and Brodifacoum.

Symptoms of direct poisoning were observed on mammalian predators in the study area after 24 hours of Zinc Phosphide treatment, indicating serious damage to the non target species of rodents' natural enemies in spite of the high potency of this acute rodenticide.

The results suggest that inserting one gram only of Zinc Phosphide baits in each active burrow, seems to be adequate to achieve high rate of efficacy against the Libyan jird in comparison to the efficacy achieved when 10 grams were inserted.

**Key words:** Aluminum Phosphide, Brodifacoum, Libyan Jird, *Meriones libycus*, Syria, Zinc Phosphide.

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<sup>(1)</sup> Master student, <sup>(2)</sup> Prof. Department of Plant Protection, Faculty of Agriculture, P.O. Box 30621, Damascus University, Syria.

<sup>(3)</sup> Administration of Plant Protection Research, General Commission for Scientific Agricultural Research (GCSAR), Doma, P. O. Box 113, Damascus, Syria.

- .(1964 WALKER)  
*M. libycus* 1823  
 (1991 Bates Harrison) *M. syrius* 1919
- (1991 Bates Harrison)  
 Amr 1996 Qumsiyeh) .(2004 Shehab)  
 .(2004
- .(1978 Atallah)
- Nitraria retusa* *Tamarix. Spp*  
 .(1999 Abu Laban 1996 Qumsiyeh) *Anabasis syriaca*
- (1989 Greaves)
- Leishmania*  
 Yaghoobi-Ershadi 1994 Ibrahim 1993 El Sibae) *major*  
 2001 Rassi) .(2001 1996  
 .(2003 Moemenbellah-Fard
- / 3 )  
 %85 %75 ( )  
 %1 *M. libycus* %2.5 %0.6  
*M. tristrami*

/ 50  
(1989 Greaves)

Buckle and Smith)

(1994

Mathur

(1981) Parakash

/ 0.083 *Tatera indica* / 0.10 LD<sub>50</sub>  
*Rattus rattus* / 0.77 *M. hurrianae*  
%100 %0.005  
(*R. rattus*) 4

*M. shawi* (1983) Redfern Gill  
%0.0375 %0.025 %0.005 )  
(%0.5 %0.005 %0.005  
%0.005

*M. shawi* %0.5  
%80

)  
(

2005

*M. libycus*

*A. syriaca*

:  
90

:

115

<sup>2</sup> 2000-1000

:

2005 14

/ 4

7.52

17.6

.1-

5.5

.%75.92

)

8

2

6

.(

Zinc Phosphide ( $Zn_3P_2$ ) :

1

( )

( %2 +

%1 +

%97)

10

24

Aluminum Phosphide (AIP) :

2

) Phostoxin

3

PH<sub>3</sub>

.(%56

( 24 )  
( 48 )  
Brodifacoum (C<sub>31</sub>H<sub>23</sub>BrO<sub>3</sub>) : 3  
(Titan)  
%0.005 2  
10  
14

( 15)

(1998 EPPO)

$$E\% = [(X-Y) \div X] \times 100$$

: Y . : X . : E :

2276

(1)

(1)

*M. lybicus*

Poisons	Unplanted			Planted			Mean
	Pre-treatment	Post-treatment	Efficacy %	Pre-treatment	Post-treatment	Efficacy %	
Brodifcoum	211	50	76.30	68	16	76.47	
	114	15	86.84	169	20	88.17	
			81.57			82.32	81.95
Aluminum Phosphide	120	11	90.83	120	8	93.33	
	120	13	89.17	120	7	94.17	
			90.00			93.75	91.87
Zinc Phosphide	218	3	98.62	210	12	94.28	
	230	5	97.82	220	16	92.72	
			98.22			93.5	95.86
Untreated control	81	73	9.88	132	103	21.97	
	96	82	14.58	47	34	27.66	
			12.23			24.82	18.52

(CV=5.25)

(LSD= 8.95) %5

%76.30

%9.88

.%98.83

%27.66

:

48 %98.62 %92.72

24

( )

)

(

( )

BUCKLE and SMITH) .(1994  
%2  
REDFERN GILL (1983)  
%0.5  
*Meriones shawi*  
(1989) GREAVES %80  
%75 %2.5 %0.6  
%85  
%2  
/ 10  
LD<sub>50</sub>  
/ 53-32  
/ 21.3 *R. norvegicus* / 27 *Mus domesticus*  
5-3 (1998 CAUGHLEY) *R. rattus*  
TWIGG) 150 %2.5 .(2000  
LD<sub>50</sub>  
) 50-40  
) %2  
(

1

(2002 ( Twig) %89 ) /  
 .(2003 Staples) 3-2 20  
 :

24 .(2 ) 48

24

(2)

48

Poison	% Efficacy			
	Unplanted		Planted	
	After 24 hour	After 48 hour	After 24 hour	After 48 hour
Aluminum Phosphide	70.83	90.83	80.83	93.33
	60.00	89.17	82.50	94.17
	<b>65.41</b>	<b>90.00</b>	<b>81.66</b>	<b>93.75</b>

%65.41 24

%81.66

%90

93.75

48

24

(1978 Atallah)  
24

)  
24 (

(1994 Buckle and Smith)  
24

48 *Spalax leucodon*

(2004 )

.( )

PH<sub>3</sub>

)  
(  
(1989 Greaves)

:

24

%88.17 %76.30

.( )

(1998 EPPO)

)

(

(1981) Parakash Mathur

/ 0.10 LD<sub>50</sub>  
 / 0.77 *Meriones hurrianae* / 0.083 *Tatera indica*  
 %0.005 *Rattus rattus*  
 4 %100  
 .(*R. rattus*)

LD<sub>50</sub>  
*Mus domesticus* / 0.40 %0.005  
*Rattus norvegicus* / 0.27

4 / 0.77-0.08  
 .(*R. rattus* ) / 0.77  
 250 %0.005

2 *Meriones libycus*  
 (1999 Abu Laban) 46 ± 96.9

(1981 Parakash Mathur) %0.005  
2

48

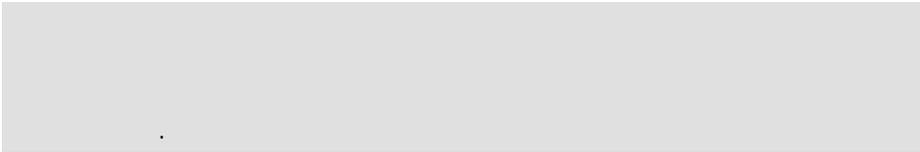
24

*M. libycus*

1

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48



## REFERENCES

- .(2004) .  
*Spalax leucodon*  
 .209-197 (2) 20 .
- Abu Laban, N. (1999). The Ecology of Some Rodents in Azraq Wetland Reserve, with a Special Reference to Some Abundant Species. M.Sc. Thesis, Faculty of Graduate Studies, University of Jordan. Amman. 182p.
- Amr, Z. S., Abu Baker, M. and Rifai, L. (2004). Mammals of Jordan. *Denisia*, 14: 437-465.
- Atallah, S. I. (1978). Mammals of the Eastern Mediterranean Region; their Ecology, Systematics and zoogeographical relationships. -*Säugetierkundliche Mitteilungen*, 26(1), 1-50, München.
- Buckle, A. P. and Smith, R. H. (1994). Rodent Pests and Their Control. Cabinternational, Cambridge. 405 pp.
- El Sibae, M. M., Eesa, N. M. and Morsy, T. A. (1993). Rodents and cutaneous leishmaniasis in Quasim, Saudi Arabia. *J. Egypt. Soc. Parasitol.* 23: 667-673.
- EPPO. (1998). Guidelines for the Efficacy Evaluation of Plant Protection Products. Vol. pp 81-144.
- Gill, J. E. and Redfern, R. (1983). Laboratory tests of seven rodenticides for the control of *Meriones shawi*. *J Hyg (Lond)*. 1983 Oct;91(2), 351-357.
- Greaves, J. H. (1989). Rodent Pests and their Control in the Near East. *FAO Plant Production and Protection paper No .95*, Rome. 112 pp.
- Harrison, D. L. and Bates, P. J. J. (1991). The Mammals of Arabia. 2<sup>nd</sup> ed., 354 pp.; Sevenoaks (Harrison Zoological Museum).
- Ibrahim, E. A., Mustafa, M. B., Al Amri, S. A., Al-Seghayer, S. M., Hussein, S. M. and Gradoni, L. (1994). *Meriones libycus* (Rodentia: Gerbillidæ), a possible reservoir host of zoonotic cutaneous leishmaniasis in Riyadh province, Saudi Arabia. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 88(1), 39.
- Mathur, R. P., Prakash, I. (1981). Evaluation of brodifacoum against *T. indica*, *M. hurrianae* and *R. rattus*. *J Hyg (Lond)*. 1981 Oct; 87(2),179-184.
- Moemenbellah-Fard, M. D., Kalantari, M., Rassi, Y. and Javadian, E. (2003). The PCR-based detection of *Leishmania major* infections in *Meriones libycus* (Rodentia: Muridae) from southern Iran. *Ann Trop Med Parasitol.* 2003 Dec; 97(8), 811-816.
- Qumsiyeh, M. B. (1996). Mammals of the Holy Land, 389 PP. Texas Tech University Press. USA.
- Rassi, Y., Jalali, M., Javadian, E. and Moatazedian, M. H. (2001). Confirmation of *Meriones libycus* (Rodentia; Gerbillidae) as the Main Reservoir Host of Zoonotic Cutaneous Leishmaniasis in Arsanjan, Fars Province, South of Iran (1999-2000). *Iranian J. Publ. Health*, Vol. 30,143-144.

- Shehab, A. H., Daoud, A., Kock, D. and Amr, Z. (2004). Small Mammals Recovered from Owl Pellets from Syria (Mammalia: Chiroptera, Rodentia). *Zoology in the Middle East.*, 33, 27-42.
- Staples, L., Smith, M. and Pontin, K. (2003). Use of Zinc Phosphide to Overcome Rodent Infestations. Pages 110-115 *In: Proceedings of the Australian Post harvest Technical Conference.* Wright, E.J., M.C. Webb and E. Highley (Editors). Canberra, 25-27 June 2003. Australia.
- Twigg, E. L., Martin, G. R., Wilson, N., Goddard, D., Watkins, R. and Anderson, P. J. (2000). Suitability of Zinc Phosphide for Controlling Rodent Pests in the Ord River Irrigation Area, Kununurra, WA Report Prepared for Agriculture WA.
- Twigg, E. L., Martin G. R. and Stevens, T. S. (2002). Effect of Lengthy on the Palatability and Efficacy of Zinc Phosphide Wheat Bait Used for Controlling House Mice. *Wildlife Research.* 29, 141-149.
- Yaghoobi-Ershadi, M. R., Akhavan, A. A. and Mohebbali, M. (1996). *Meriones libycus* and *Rhombomys opimus* (Rodentia: Gerbillidæ) are the main reservoir hosts in a new focus of zoonotic cutaneous leishmaniasis in Iran. *Transactions of the Royal Society of Tropical Medicine and Hygiene*, 90, 503–504
- Yaghoobi-Ershadi, M. R., Hana. -Bojd, A. A., Akhavan, A. A., Zahrai-Ramazani, A. R. and Mohebbali, M. (2001). Epidemiological study in a new focus of cutaneous leishmaniosis due to *Leishmania major* in Ardestan town, central Iran. *Acta Tropica*, 79, 115–121.
- Walker, E. P. (1964). Mammals of the world. Vol. II .John Hopkins, Baltimore. 647-1500.

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