Trogoderma granarium (Everts) (Coleoptera : Dermastidae)

(2004/7/3   2003/9/23   )

Trichoderma   *Bacillus thuringiensis* (Berliner)

Beauveria bassiana (Vuill)   *harizanum* (Rifia)

Trogoderma granarium (Everts)

/ 10×4^{5} 10×2^{6} 10×2^{6} .

%92.6   88   92.5

.

(P.V.C)

.

The Effects of Three Biological Agents Control on Khapra Beetle
Trogoderma granarium (Everts.) (Coleoptera : Dermastidae)

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ABSTRACT

In the first part of this study the Khapra Beetle eggs were impacted to the corn seeds that treated with concentration 2×10^6 spore/ml of *Bacillus thuringiensis* (Berliner) and 2×10^6 spore/ml of *Trichoderma harizanum* (Rifia) and 4×10^5 spore/ml of *Beauveria bassiana* (Vuill), they were highly effective, the mortality percentages of this insect were 92.5, 88 and 92.6% respectively.

In the second part of this study three kinds of sacks were treated with the same concentrations of the forenamed agents, the results showed that these agents can protect the corn seeds foon infestation by this insect for six months compared with that of untreated ones and the P.C.V. sack is the best.

Trogoderma   granarium

(2002   )   .(1983   )

23

.

.(2000   )

Bacillus   thuringiensis

.(1994   )

90   1870

(Ferron, 1978)   . (Roberts, 1981)

(Jassim, 1984)   (Deacan, 1983)

B-endotoxin. b

.

100   1890   *Beauveria bassiana*

(   )   (2000   )

(1989   )

(Deacon, 1983)   Beauvericin

.   (Jassim, 1984)

%100   *Trichoderma harizanum*

1984

Scolytus sp.   *Ceratocystis ulmi*

(Jassim, 1984)

.(Jassim et al., 1990b)

.   *B. thuringiensis*

Dasyneura perrisia

Ephestia   (1988   ) %98

/ 3×10^5 %98.9   *cautella*

.(1992   )

T. granarium

(7×10)   20

%70±5   30°

.

Nutrient Agar   *B. thuringiensis*

7   30°

/   (1×10^4 1×10^5 2×10^5 1×10^6 2×10^6)

.

T. harizanum   B. bassiana

25°   PDA

B. bassiana   /   1×10⁴   2×10⁵   3×10⁵   4×10⁵

/   1×10⁴   1×10⁵   2×10⁵   1×10⁶   2×10⁶

T. harizanum

.(Cantwell and George, 1974)

50   )   200

(

50

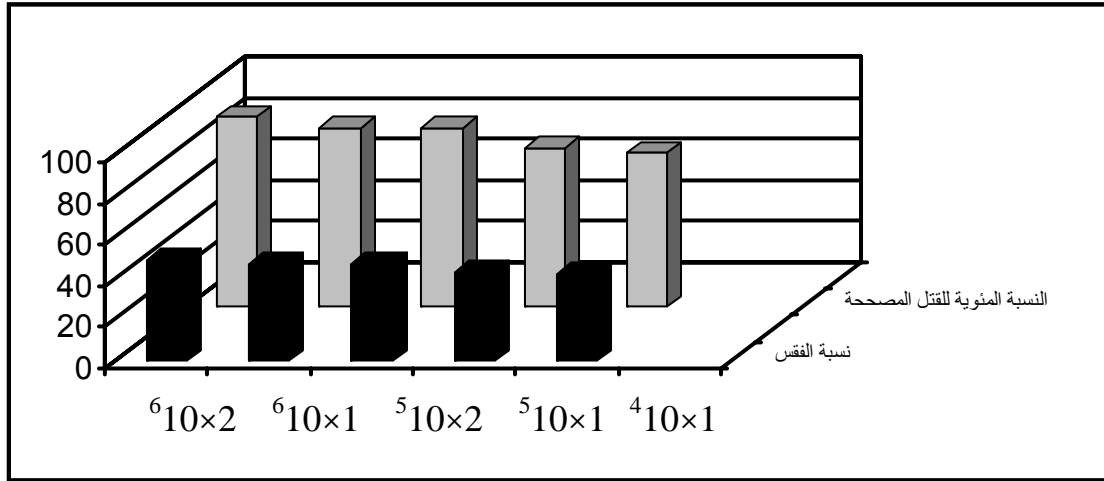70±5%   30°   .
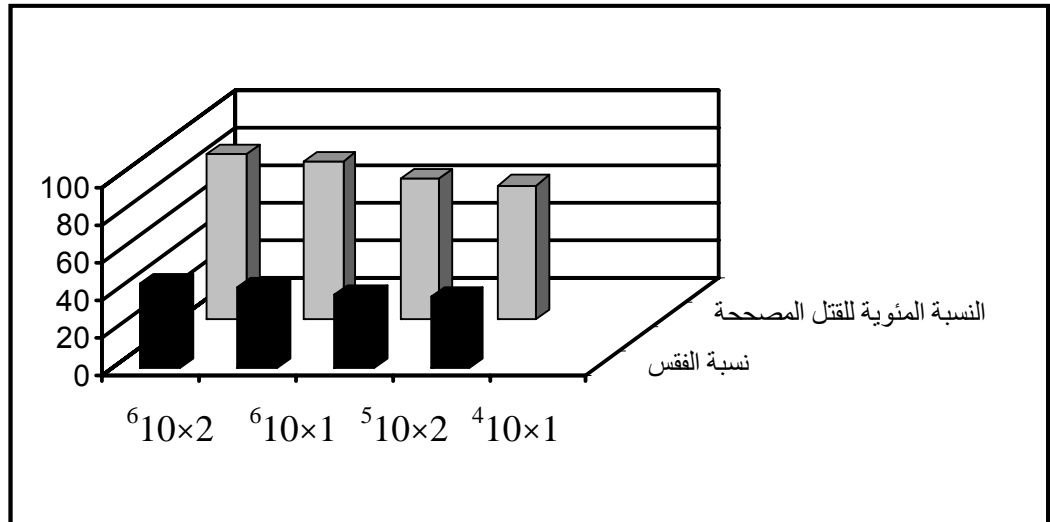
24

. (Abbot,   1925)

.L.S.D

.

(10×15)   (P.V.C)

100   .

10

.

(1)

2×10⁶   /   92.5%

1×10⁴   /   75%   20%

.

النسبة المئوية للقتل المصححة
نسبة الفقس

2×10⁶   1×10⁶   2×10⁵   1×10⁵   1×10⁴

1 :   *B. thuringiensis*

.

*   L.S.D.   9.1   0.05

(Ferron, 1978)

.(Jassim et al., 1990a)

2×10⁶   (2)

/   1×10⁴   /   88% *T. harizanum*   /

71.5%   12%

.

.*Scolytus* sp.   (Jassim et al., 1990b)   (Ferron, 1978)

النسبة المئوية للقتل المصححة

نسبة الفقس

2×10^6 1×10^6 2×10^5 1×10^4

2 : *T. harizanum*

.

*   L.S.D.   6.4   0.05

(3)

4×10^5 /   *B. bassiana*   %92.6   %76.1

1×10^4 /   %16   .

النسبة المئوية للقتل المصححة

نسبة الفقس

4×10^5 3×10^5 2×10^5 1×10^4

3 : *B. bassiana*

.

*   L.S.D.   8.4   0.05

B. bassiana 2×10^5 3×10^5 4×10^5

1×10^4 3×10^5 4×10^5

.
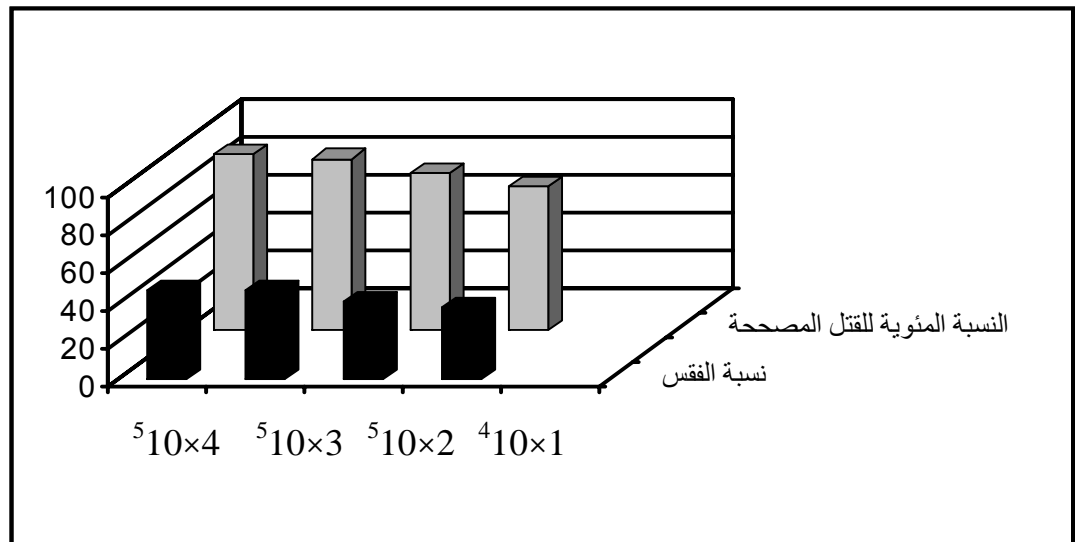
.(1992)

B. thuringiensis

/ 4×10^5 *B. bassiana* / 2×10^6 *T. harizanum*

(1)

B. thuringiensis 7%

T. harizanum *B. bassiana*

15% 8-2% 8-1% 7-2%

.

.

:1

.

( )													
12	11	10	9	8	7	6	5	4	3	2	1		
7	6.5	5	4.5	3	2	0	0	0	0	0	0	*B. thuringiensis*	P.V.C
8	7	5.5	4	3	1	0	0	0	0	0	0	*B. bassiana*	
8	7	6	4.5	3.5	2	0	0	0	0	0	0	*T. harizanum*	
7	6.5	5.5	4.5	3	2.5	0	0	0	0	0	0	*B. thuringiensis*	
8	7	6	5	3	1	0	0	0	0	0	0	*B. bassiana*	
8	7.5	6	4.5	4	2	0	0	0	0	0	0	*T. harizanum*	
11	9	8	7	5	3	0	0	0	0	0	0	*B. thuringiensis*	
10	8	7	6.5	5.5	3	0	0	0	0	0	0	*B. bassiana*	
11	8	7.5	6	5.5	3	0	0	0	0	0	0	*T. harizanum*	
15	14	12	11.5	11	9	7	6	4.5	4	2	0.5		

LSD 3.2 0.05

. 2.7

.2002

/ .( )

97 .

.1983

. 290 .

.2000

.138-133 : 18 .

.1988

Beauveria bassiana *Ephestia cautella*

.49-44 : 6 .

.1989

. *Dusynura oleae*   .623-613

.   .1994   .

.   120   .   .

.1992

Beauveria   *Bacillus thuringiensis*   *Ephestia cautella*

.148-124   : 32 .   *bassiana*.

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