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ORIGINAL ARTICLE

Comparative Effect of Lemon Grass Powder (Cympobogon Citrates) and B.T. Bacteria on Perdition of Rice Beetle (Sitophillus Oryzae)

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ABSTRACT
The rice weevil is considered one of the important insects on stored grains. The aim of the current study was to find death and repellant effect of both lemon grass(Cympobogon citrates) and bacterial preparations(Bacillus theuringensis) on Sitophillus oryzae , Where the results of the study indicated , Where the highest rate of killing of larvae was after two weeks reach 100% for the treatment bacteria at two concentrations ,while the treatment by lemongrass was 33.33% on concentration 10% . The highest rate of expulsion for adults was 100% after 48 hours of treatment of lemongrass and the bacterial preparation with concentrations 10 and 5 % Respectively, as for the treatment of expulsion of the insect larvae the study indicated that the highest percentage of expulsion was 100% after two hours of treatment with the powder and bacteria, for both concentrations of the two treatments.

Keywords: Bacillus thurengensis , Cympobogon citrates , Sitophillus oryzae

INTRODUCTION
The pests that affect grains are among the main problems that cause the damage of Stored in the world approximately (10-40%) of food crops (AL-Jaber,2006).

Stored insects contribute to the contamination of food products through the presence of live insects and insect products such as secretions chemical or silk, dead insects and insect body parts, accumulation of pesticide residues in food, as well as exposure human to hazardous chemicals as a result of pest control , Rice comes After wheat ,is economically important and constitutes food second in the world More than 70 per cent of the world's population Asian, including India, is a source of livelihood for 120-150 million rural households (Vigay and Bhuvaneswari , 2018) .

The rice weevil is one of the most dangerous pests of stored materials that honor all over the world, especially in tropical and semi-tropical areas, Rice weevil is one of the main insects that infects rice, and it also infects wheat ,Corn, rye, oats, barley, sorghum, dried beans and millet, as found on nuts and pistachios Almonds also feed on granular products such as pasta and asbestos, especially when they are old (Koehler, 2012).

Tropical, attacking cereal crops in the warehouse and field and prefers rice, in addition to being a primary insect infecting grain It makes them vulnerable to attack other insects unable to attack the proper grain In addition to the heavy economic losses caused by rice weevil, The quality of raw materials, final products and commercial value also affect seed viability because of the important losses they cause (Musa and et al, 2011).

Insects for stored materials and grains as a result of total dependence on pesticides in control and what is produced of pollution and resistance character (Federici ,2005).

As a result of the imbalance in the natural balance and the deterioration of the components of the environment, research has tended to use other methods in Control, including the use of repellents and plant extracts and vegetable oils (Timothy and Esther, 2009) . Insert powders and pathogens as one of the modern trends of IPM .

MATERIAL AND METHODS
The current study aimed at assessing the efficacy of different concentrations of bacteria B.T. and lemon grass in killing larvae of weevil rice, and evaluating the effectiveness of lemon grass in repelling adults and insect larvae.

1. Collection samples plant:
Lemon grass was obtained from private farms in Baghdad - Iraq and a diagnosis was confirmed and taken the leaves of the plant, washed well, dried and then ground it with a blander to obtain the raw powder .

2. Get the bacteria:
The pesticide formulation B.T (Bacillus thurengensis) was obtained from Probelte Spanish Company.

3. Insect breeding:
The insect was obtained from infected rice cereals, It has been bred on stock rice (-18 degree) to ensure that it does not infect other insects in Plastic containers ($20\times20\times20cm^3$) The nozzles are sealed with muslin cloth to ensure no insects escape, Then the insect was raised inside an incubator with temperature 27±2C and relative humidity of 75±5% to obtain a permanent farm from an insect (Vigliango and et al,2008).

4. Larval mortality decimation by using different concentrations of lemon grass and B.T.:
Lemon grass has been added in concentrations (5, 10)% and add bacteria B.T at concentration (2.5, 5)% to container dishes on larval food consisting of crushed rice cereals (Five replications per treatment) after that ten young larvae were introduced for every dish then cover dishes by thin cloth and tied with elastic band , daily Watched to calculated the number of dead larvae for two weeks, The killing rate was corrected according to(Abbott ,1925)

5. Expulsion treatment:
This experiment done dependent to (Naowrth, 1973) with some modification in the effect of lemon grass and bacteria B.t was based on the expulsion of adult and larvae insects, where taken a large plate with 20cm diameter and 2cm height ,In the middle paste a small plate with 10cm diameter and 1cm height , then add 10 g of broken rice grains to each dish and add lemon grass powder in a concentration (5,10)%, and bacteria in a concentration (2.5,5)% , Entered 10 adult and 10 larvae of insect to every dish(Five replications per treatment) and calculated the percentage of expulsion according to number of insect that go out the large dish to the small dish for two weeks.

6. Statistical analysis :
The results were statistically analyzed according to the design Complete Randomize Designed. The results were compared with the least significant difference (L.S.D), The results of mortality were corrected according to an equation (Abbott,1925)

$$\text{Corrected percentage for mortality} = \frac{\text{The died on treatment} - \text{died on control}}{100 - \text{died on control}} \times 100$$

RESULTS AND DISCUSSION
The results of the table (1) showed that the bacteria superiority in killing the larvae of rice weevil after two days of treatment, by a percentage reached at 43.33% on concentration 2.5,5%. While least mortality in the treatment lemon grass after two days was 4, 6.66 % on concentration 5,10% respectively. The bacteria achieved the highest ratio of insect mortality at 100% after two weeks of treatment . The reason for the different duration and proportions of larval decay may be due to its ability to produce

different types of toxins, such as protein crystal poison or internal poison (Delta- endotoxin) and the external poison (Beta- exotoxin) and thermally stable enzyme that Phosphorous fat analyzer (phospholipase –c) and (Lecithenase-c) (Heimple,1959) .

As for the effect of lemon grass, it may have a toxic effect during contact with the cuticle of the insect's body and penetration of the chemical compounds of the cuticle through the elastic areas and respiratory stomata, causing paralysis and death.

Table 1: Effects of addition different concentrations of lemon grass powder and bacterial pesticide on the destruction of larvae of weevil rice during a different time period.

Substance	Concentration %	Percentage of death after 48 hour	Percentage of death after one week	Percentage of death after two weeks
Lemon grass	5	4	10	23.33
	10	6.66	13.33	33.33
Bacterial pesticide	2.5	43.33	86.66	100
	5	43.33	96.66	100
Control		0	0	0
L.S.D		5.75	6.61	8.30

Table 2: Repellent effect of different concentrations of lemon grass and bactericide on larvae and adult insect.

Substance	Concentration %	Stage	Percentage of repellent after 48Hor.	Percentage of repellent after week
Lemon grass	5	Adult	%80	%80
	10		%100	%90
	5	Larva	%100	%90
	10		%100	%90
Bacterial pesticide	2.5	Adult	%80	%80
	5		%100	%90
	2.5	Larva	%100	%90
	5		%100	%90
L.S.D	-	-	12.25	13.55

As for experience which includes the percentage of repellent larvae and adults of, from the table (2) there is an indication there were no significant differences between the different concentrations on adults and larvae for each treatment separately. It has reached the expulsion rate of larvae after two days 100 % for each concentration and each treatment lemongrass and bacterial pesticide, whereas, after two weeks of treatment, the percentage of larvae expelled between 80 - 90% according to the concentrations used. Whereas for adults; the rates were higher after two days of treatment for both substances and at the same concentrations (table 2).

The effects of most plant powders on insects are by stimulating the nerve centers and then suddenly inhibiting them from what happens. Nervous shock and the occurrence of paralysis or toxic effect during contact with the surface of the body and choose chemical compounds for extracts and powders

In a similar study mentioned (Plata-Rueda,et al ,2020) that Sitophilus granarius adults exposed to high doses of lemongrass essential oil, and when exposed to LD90, paralysis without recovery. In this case, symptoms were consistent in S. gran .

In this regard (Saljoqi , et al ,2006) was mentioned that the rate of expulsion of lemon grass was 18.60 days in the stored grains.

CONCLUSION

The results of the study indicated that the highest rate of killing of larvae was after two weeks reach 100% for the treatment bacteria at two concentrations ,while the treatment by lemongrass was 33.33% on concentration 10% . The highest rate of expulsion for adults was 100% after 48 hours of treatment of lemongrass and the bacterial preparation with concentrations 10 and 5 % Respectively.

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