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Effect of the Bacteria *Bacillus thuringienesis* var kurstaky on second larval instar of Angoumois moth *Sitotroga cerealella*

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ABSTRACT

An experiment done in the year 2018 to know the effect of bacteria *Bacillus thuriningienesis var kurstaky* on second instar larval of Angoumois moth *Sitotroga cerealella*. Mortality was 66.8, 82.0 and 100% in concentration 2,4 and 6 g/Kg seeds, the moth when reared on milled wheat seeds. while mortality was 53.6, 63.1 and 87.5% in same concentration above while veared the larval stage on wheat seeds and emergence of adults was 93.3 control and 47.1, 27.7 and 9.2% in 2.4 and 6 g/kg respectively.

Key words: *Bacillus thuringienesis, Second larval instar, Sitotroga cerealella*

Intoduction

The Angoumois moth *Sitotroga cerealella* (Olivier) (lepidoptera: gelechiidae) is a cosompolitin and the most destructive primary insect of several stored grains causes losses in grain products at about 5-10% in temperate region or 20-30% in tropical regions (Shaay, 1997). Many pesticides lost their effectiveness and most insect pests became resistant, the search for ways to control rather than exterminate pests was the correct environmental solution (Slomy *et al*., 2019). Some time the damage in seeds was 50% of all yeled of seeds (Formal *et al*., 2007). The most important of these pests was angoumis grain moth *Sitotroga cerealella* (dlsak+rakowaki, 1997). It is most important pest and primarily infects wheat and barley corn and another seeds the larvae infect the seeds which draw in the seed and feed and consume it (Monica *et al*., 2011). The microorganism has the genetic capability to acquire and transfer the resistance to the antibiotic then lead to generate new main health problems in the world (Jasman *et al*., 2019). The microbial control of pest was important and the naturally occuring bacteria *Bacillus thuringienesis* is important to control anggoumois grain moth. This bacteria is found in every environment and it has protenous crystal poisoning to lepidoptran insects (Schnept *et al*., 1998).

Materials and Methods

The cultural of *S. cerealella* was done in stored products at Insect college of biotechnical in Musaib. It was reared on grain seeds which were put in boiled water for ten minites and lead open to sun for one day. The reared insects when became soft were put in glass jar Ik g capacity. The comerical bacteria blithroid was used which contain 32.000 Iu/mg spores of bacteria *Bacillus thuringienesis* kurstaky treated the grilledgrain three concentration 2,4,6 g/km seeds in three treated and control treated which mixed with dust only the treatment grilled grain and seeds grain with bacteria toxin but in glasses tube (2.5 *8.5 cm) and each tube consider replicate

then we put 25 larave age 2nd instar in each tube the replicates in an incubator 30 ± 2°C and RH. 70 ±5 % recorder the mortality and adult emergence and losses in weight of larvae for 72 hours after treatment with bacteria.

Results and Discussion

The results of Table 1 show that the mortality of 2nd instar larvae of *Sitotroga cerealella* when fed on grilled grain increases with the increased of bacteria concentration it was 66.89%, 82.00 and 100% in concentration 2.4 and 6 g/kg and adult emergence wat 32.3, 12.4 and zero % and the loses in weight of grain 0.32, 0.12 and 0.08 g respectively. The effect on was significant in all treatments. Alberner (1998) found in Syria the *B.t.* kurstaki in different conc the mortality was 86% IN CONC 3 gram/ kg and the effect of bacteria increased when the conc of bacteria in creased Oppert *et al*., (2010) found that the *B.t.* kurstai was effective on small age of larvae. Mcgaughey (1986) in laboratory and experiment study whe he used *B.t.* on surface of grain was effective aginst infection of many insects on of them was *Sitotroga cerealella* in percentage 95%.

Table 1. Effect of *b.t.kurstaky* on 2nd larval instar of Angoumois grain moth *Sitotroga ceralella* reardon grilled grain seeds.

Conc of *b.t* Gram	Mortality %	Adult emergence %	Loses in weight of grain
2	66.89	32.3	0.32
4	82.00	12.4	0.12
6	10.0	Zero	0.08
Control	2.01	98.0	20.1
l.s.d	0.05 > 5.52		

When the insect *S.cerealella* reared on grin seeds the results were different. Table 2 show that mortality was 53.6, 63.1 and 87.5% in conc 2, 4 and 6g/kg while in control was zero the adult emergence was 47.1, 27.7 and 9.2% in 2, 4 and 6g/kg of bacteria while in control treatment 93.3% the losess in weight per gram was 0.52, 0.32 and 0.09 in three coc. While 0.96 gram in control treatment the damage of seed decresed in the increase of conc, of bacteria also in Table 2 show the damage was 23.3% in control when it was 12.4, 7.0 and 2.1% in conc 2,4 and 6 g/kg.

Table 2. Effect of bacteria *B.t. kurstaky* on 2nd larveal instar of Angoumois grain moth *Sitotroga ceralella* reardon grilled grain seeds.

Conc of *b.t* Gram	Mortality %	Adult emergence %	Loses in weight of grain
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