

## C626931 MAJOR BIOTECHNOLOGY  
KEY WORD: *Bacillus thuringiensis* / *Achroia grisella* / *Galleria mellonella* / TOXICITY

SURACHAI LEEPITAKRAT : INVESTIGATION OF THE EFFICACY OF VARIOUS STRAINS OF *Bacillus thuringiensis* ON THE LESSER WAX MOTH *Achroia grisella* AND THE GREATER WAX MOTH *Galleria mellonella*. THESIS ADVISOR : PROF.SIRIWAT WONGSIRI, Ph.D. THESIS CO-ADVISOR : KRIANGKRAI LERDTHUSANEE, Ph.D. 92 pp. ISBN 974-636-816-8.

Activity of 27 strains of *Bacillus thuringiensis* against the lesser wax moth, *Achroia grisella* and Greater wax moth, *Galleria mellonella* were determined in the laboratory by a feeding method. Only 3 out of 27 strains of *Bacillus thuringiensis* *kurstaki*, *Bacillus thuringiensis* *entomocidus* and *Bacillus thuringiensis* *dendrolimus* were toxic to the larvae of wax moths. The toxicity of *Bacillus thuringiensis* by feeding the larvae on artificially treated media was:  $LC_{50}$  (48 hr.) of *Bacillus thuringiensis* *kurstaki* were 0.34 and 1.64 % (w/w), *Bacillus thuringiensis* *entomocidus* were 0.25 and 0.65 % (w/w) and *Bacillus thuringiensis* *dendrolimus* were 0.45 and 0.51 % (w/w) for the first to second instars and third to fourth instars of *Achroia grisella*, respectively. The  $LC_{50}$  (48 hr.) of *Bacillus thuringiensis* *kurstaki* were 1.02 and 1.29% (w/w), *Bacillus thuringiensis* *entomocidus* were 0.17 and 0.48 % (w/w) and *Bacillus thuringiensis* *dendrolimus* were 0.76 and 1.13 % (w/w) for the first to second instars and third to fourth instars of *Galleria mellonella* respectively.

The toxicity of *Bacillus thuringiensis* to wax moths was also studied by feeding larvae on treated wax comb. The  $LC_{50}$  (48 hr.) of *Bacillus thuringiensis* *kurstaki* were 2.72 and 11.81 g/l., *Bacillus thuringiensis* *entomocidus* were 0.11 and 0.86 g/l. and *Bacillus thuringiensis* *dendrolimus* were 0.004 and 0.28 g/l. for the first to second instars and third to fourth instars of *Achroia grisella*, respectively. The  $LC_{50}$  (48 hr.) of *Bacillus thuringiensis* *kurstaki* were 9.20 and 5.38 g/l, *Bacillus thuringiensis* *entomocidus* were 0.07 and 0.18 g/l. and *Bacillus thuringiensis* *dendrolimus* were 3.98 and 4.54 g/l for the first to second instars and third to fourth instars of *Galleria mellonella*, respectively.

Delayed effects of sublethal dosages on adult emergence was studied by feeding larvae on artificial media treated with the bacteria. The first to second instars and third to fourth instars of *Achroia grisella* did not develop to adult stage in media treated with 0.3 % of *Bacillus thuringiensis* *entomocidus* and *Bacillus thuringiensis* *dendrolimus*, 0.4 % of *Bacillus thuringiensis* *kurstaki*. The first to second instars and third to fourth instars of *Galleria mellonella*, and 0.4 % of *Bacillus thuringiensis* *dendrolimus* and *Bacillus thuringiensis* *kurstaki* and 0.1 % of *Bacillus thuringiensis* *entomocidus*.

Toxicity on the larvae of *Apis cerana* was also tested. There was no significant activity on the larvae at the concentration of 10.0 % (W/W) at 24, 48 and 72 hr. when compare with control groups.

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