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"Larval Mortality Response of Diacrisia Obliqua" Effected by Using of Different Formulations of Bacillus Thuringiensis

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ABSTRACT

This study was carried out to determine the effect of commercial preparation of Bacillus thuringiensis (bio control agent) namely Dipel, Thuricide HP and Bactospeine against the Bihar hairy caterpillar that is Diacrisia oblique walker of the family Arctiidae belong to order Lepidoptera .Five concentrations like 0.05, 0.10,0.50, 0.75, and 1.0% of different formulations are used against the third instar larvae of D. obliqua taken from the laboratory stock. All these three microbial prepration that is Dipel, thuricide HP and Bactospeine were toxic to the test insect but Dipel proved to be most effective . These insecticides are considered safe to the environment and natural enemies . So Bacillus Thuringiensis insecticides are safe components in IPM programmes. Various formulation of B.T. are best for controlling the lepidopteron pests . These bio-pesticides to save the different crop of agricultural, horticultural and forest importence.

Keywords: Diacricia Obliqua, Deltaindotoxins, Efficacy, Mortality, Thuringiensis.

I. INTRODUCTION

The advances in science and technology over the years have helped the economic entomologist to reveal various approaches to pest management in keeping the pest population below economic injury level. Many conventional insecticides such as Cholorinated hydrocarbons, Organophospahates, Carbonates etc., were used in the controlling insect pest but, many of these insecticides are harmful to man and beneficial organism which causes ecological disturbense. For the world wide attention there is developed newel compound which affecting mortality, growth and developmental processes in insects, such as Chitin synthesis inhibitors and different formulation of Bacillus Thuringiensis. Progress has been made to introduce iimproved bio-control agents such as B.T for controlling Lepidopteran, Coleopteran and Dipteran pest. B.T kills insects primarily through the action of **delta** indotoxins which is a protenieous constituent produced during sporulation. It affects the insect midgut epithelium upon ingestion (Narayan & Jayraj 1975, Hofte & Whitley 1989, Gill et al 1996, Naglaa et al 2004).

Most conventional B.T products are based on the sub species Kurstaki HD-1 introduced by Abbott in laboratory followed by Sandoz, Nova, Ecogen, Monsato for controlling lepidopteran pest (Navon 1993, Kumar & Gujar 2005). Various formulation of B.T Kurstaki sucah as Dipel (HD-1 Abbott) Thuricide, (HD-1 Sandoz), Biobit (HD-1 Nova), Javelin (NRD-12, Sandoz) are available for controlling the lepidoteran pest. Diacrisia Obliqua Walker belonging the family Arctiidae and order Lepidoptera and commonly known as Bihar Hairy caterpillar. The population of D.Obliqua started growing faster and reached an explosive stage in August 2002. A perusal of literature divulge that work done in

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India related to effect of B.T formulation on D.Obliqua is very secured and fragmentary. However there are some important aspects like effect of exposure period on insects mortality, effect of lethal and sub-lethal concentration of B.T on the mortality growth and development of insects.

II. MATERIAL AND METHODS

Three commercial preparations of B.T Thuringiensis namely Dipel, Thuricide HP and Bactospeine.These are commercial preparations of B.T used against the third instar larvae of D.Obliqua taken from the laboratory stock. Five concentrations like 0.05, 0.10, 0.50, 0.75 and 1.0% of different formulations are used. Small and uniform size of castor plants were used and these plants were treated with each concentration of bacterial preparations by leaf dip method. In this method of treatment small and uniform size of leaves of host plant (castor plant) were treated with each concentration of particular bacterial preparations by dipping the leaf in microbial preparation of B.T.

Twenty larvae of taken from laboratory stock already starved for 12 hours. After 12 hours starvation larvae released on the treated leaves for 24 hours for feeding and after that normal food was offered to them for the rest period. Observatinos on moratlity of larvae were recorded after 24 hours and continued for the period of 10 days. Moribund (dying condition) larvae were also counted as dead. In control larvae were treated with water containing 2% skimmed milk solution.

The data thus recorded were subjected to probit analysis as per procedure For calculating the LC50 and LT50 values. The LT50 was calculated log days in place of log concentration on the basis of screening different bacterial preparations of B.T.

III. RESULT AND DISCUSSION

Data pertaining to influence of bacterial preparations against the lavae of D.Obliqua shows that all the three microbial prparations that is Dipel, Thuricide HP, Bactospeine were toxic to the larvae of test insect but Dipel proved to be the most effective followed by Thuricide HP and Bactospeine at all the concentrations tested. It can be further seen that LC50 value has negative co-relation with the toxicity of microbial preparations tested, lowest (0.0930) was observed in case of Dipel while it was highest against Bactospiene (0.1540). Thuricide HP behaved intermediary (0.1039). Log probit curves of these microbial preparations clearly shows the values ranging from 1.556 – 1.571(table 1)

Similar results were also reported by Srivastava (1984) against the larvae of P.demoleus. Low LC50 value for Dipel against other Lepidopterous insects have also been reported by Dorivojevic and Injac (1975) ; Movavad et al (1975); Srivastava and Nayak (1978); Bosjelmen et al (1984); Caturvedi (2002); Bajpai (2003); Nagla et al (2004); Kumar and Gujar (2005);

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Table :1

Effect of Dipel, Thuricide HP and Bactospeine Against 3rd Instar Larvae of D.Obliqua

S.No	Name of Formulation	Average Percent Mortality					LC50
		Concentration of Bacterial Preparations					
		0.025	0.05	0.10	0.25	0.50	
1.	Dipel	24.13	31.03	44.82	82.75	89.65	0.930
2.	Thuricide HP	20.00	30.00	46.67	80.00	86.66	0.1039
3.	Bactospeine	13.33	23.33	30.00	66.67	80.67	0.1540

As regards the toxicity index of different varieties of microbial preparations used in this investigation, it can clearly be seen from table 2 that Dipel has the highest toxicity index 1.0 whereas it was lowest 0.60 in case of Bactospeine. Thuricide HP had toxicity index (0.89).

Dipel took the minimum time (48 hrs) to initiate the kill of the insect and maximum time (120 hrs) to produce 89.99% mortality at one % concentration, whereas at the same concentration bactospeine consumed as much as 168 hrs to start and 240 hrs for giving the highest (80%) larval mortality.

Table: 2

Toxicity Index of Different Bacterial Preparations Against 3rd Instar Larvae of D.Obliqua

S.No	Name of Formulation	Spore Count /Gram of Active Product	Regression Equation	Lietero Genecity	Fiducial Limit	Toxicity
1.	Dipel	25*10^9	Y=1.905+1.57	3.605	0.1312 (U) 0.066 (L)	1.00
2.	Thuricide HP	30*10^6	Y=1.860+1.556	4.97	0.144 (U) 0.740 (L)	0.89
3.	Bactospeine	10*10^8	Y=1.584+1.562V	2.28	0.2157 (U) 0.1096 (L)	0.60

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Results have shown that all the formulation tested offered and effective control of the test insect but Dipel manifested it superiority over the other microbial preparations. It is encouraging to note that larval mortality caused by Dipel was to the time of 89.99% and it was closely followed by Thuricide HP 86.66%.

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REFERENCES

[1] Svestka 1975; Lipal et al 1977, Verma &Gill (1987), Moawad et al(1985), Baker (2004) & Detoh and Azazy (2004)

[2] Srivastava & Nayak (1978), Srivastava (1984), Bajpai (2003), Krieg (1961), Heimpel (1967), Verma & Gill (1977), Hamid (1978), Desh pandey (1982),

[3] Chaturvedi, R.K (2003), Studies on the effectiveness of Bacillus thuriengiensis against Utetheisa pulchella (Lipidoptera; Arctiidae), Indian Society of Life Sciences. pp 68-69

[4] Narayan, K & Jayraj S. (1975) Effect of B. thuriengiensis on size, weight and fat content of citrus leaf caterpillar, Papilio demoleus, Madras, Agric, J.62; pp 367-

[5] Srivastava, R.P & Nayak, P. (1978). Laboratory evaluation of four formulations of B. thuriengiensis against Cnaphalocrosis medinalisgn (Pyrilidae;Lepidoptera) The rice roller, zeitschrift fiir pflanzenkaran kheitem un pflanzenschuz 85 (11); pp 641-644

[6] Hamid, A.R (1978), Effect of B. thuriengiensis on xponomeuta evonymellus and x.podellus (Lepid optera ; yponomeutidae). Zeitschtrift fur Angewandte Entomologie 85(4) pp 392-412

[7] Heimpel,A.M (1967). A critical review of B.thuriengiensis Berliner and other crystalliferous bacteria. Ann. Rev. Entomol. 12 pp 287-322

[8] Moawad, G.M.Shalaby, F.F.Metwally, A.G. and Jemeily, M.M (1985). Laboratory pathogenicity test with two commercial preparations of B. thurien giensis on the first instar larvae of the spiny bollworm (Earias insulana.) Bull. SOC. Entomol. Egypte, 10)64); pp 137-144