



Evaluation of native Baculovirus on *Boarmia variegata* Moore. (Geometridae: Lepidoptera) a major defoliator of *Melia azedarach* L.

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Abstract

Boarmia variegata Moore (Geometridae: Lepidoptera), a looper larva is one of the major pests of *Melia azedarach* an important fast growing tree species in North East India. The larvae consume the leaf completely and leaving the mid vein and some basal portion of leaf while defoliation. The peak period of larval attack is during the month of June to October. During recent years (2011-12), *B. variegata* have been found to cause extensive damage by defoliating the *M. azedarach* seedlings kept in the nursery of Rain Forest Research Institute, Jorhat, Assam. Most of the larvae were died naturally due to viral infection. It was found that the occlusion bodies (OBs) isolated from the cadaver of II instar larvae of *B. variegata* was found to be in a concentration of 2.06×10^{10} PIB/ml. Pathogenicity test was conducted through bioassays using the leaf dip method to confirm the effect of NPV on II instar larvae of *B. variegata* with four different concentrations viz. 2.06×10^{10} , 2.06×10^8 , 2.06×10^6 , 2.06×10^4 PIB/ml in laboratory condition. The results revealed that the concentrations 2.06×10^{10} and 2.06×10^8 PIB/ml were found effective against the larvae of *B. variegata* and causing 100 percent mortality.

Keywords: *Boarmia variegata*, *Melia azedarach*, defoliation and mortality

Melia azedarach is an important fast growing tree species grown in North East India particularly in Assam. *Boarmia variegata* Moore. (Geometridae: Lepidoptera), a looper larva is one of the major pests of *Melia azedarach*. The adult is whitish gray or pale colour moth with a wing expanse of about two inches. The caterpillar, a looper with two pairs of sucker feet on the last abdominal segments occurs in two colour forms, green with dark lines or pale yellowish brown and attains a full size of 2 to 2.5 inches. The larvae consume the leaf completely and leaving the mid vein and some basal portion of leaf while defoliation. The peak period of larval attack is during the month of June to October. During recent years (2011-12), *B. variegata* have been found to cause extensive damage by defoliating

the *M. azedarach* seedlings kept in the nursery of Rain Forest Research Institute, Jorhat, Assam. It was found that most of the looper larvae were died naturally and were found infected by viral infection.

Screening of such larvae was conducted for isolating Nuclear Polyhedrosis Virus (NPV) after the method of Sudhakar *et al.* (1997). It was found that the occlusion bodies (OBs) isolated from the cadaver of II instar larvae of *B. variegata* was found to be in a concentration of 2.06×10^{10} PIB/ml. Pathogenicity test was conducted through bioassays using the leaf dip method to confirm the effect of NPV on the II instar larvae of *B. variegata* (Tran and Chaudhari, 2002) with four different concentrations viz. 2.06×10^{10} , 2.06×10^8 , 2.06×10^6 , 2.06×10^4 PIB/ml in laboratory condition.

Table - 1. Evaluation of Baculovirus against *Boarmia variegata* (II instar) in Laboratory condition

Treatment	Treatment /conc. In PIB/ml	Evaluation of Baculovirus - <i>Boarmia variegata</i> Mortality % of (II instar)						
		R1	R2	R3	R4	R5	Treatment Total	Mean
1	T1 (2.06×10^{10})	100.00	100.00	100.00	100.00	100.00	500	100.00
2	T2 (2.06×10^8)	100.00	100.00	100.00	100.00	100.00	500	100.00
3	T3 (2.06×10^6)	100.00	100.00	98.00	88.00	90.00	476	95.20
4	T4 (2.06×10^4)	34.00	40.00	30.00	20.00	30.00	154	30.80
5	T5 Control	0.00	0.00	0.00	0.00	0.00	0	0.00
Rep total (R)		334.00	340.00	328.00	308.00	320.00		
Grand total							1630	
Grand mean								65.20

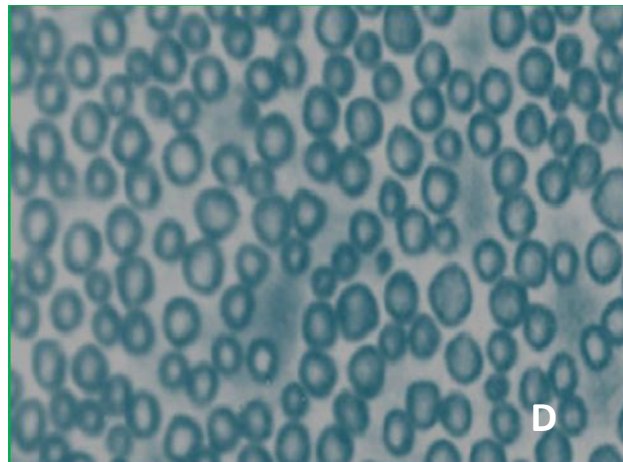


Fig. 1. A. *Melia azedarach* seedlings defoliated by *Boarmia variegata* , B. *B. variegata* larva C. *B. variegata* infected by Baculovirus D. Polyhedral inclusion bodies (PIB)

Table - 2. Statistical Analysis of evaluation of Baculovirus *Boarmia variegata* against (II instar) in Laboratory condition

Source of variation	Degree of freedom	Sum of squares	F calculated	Tabular F	
				5%	Significance
Replication	4	125	2.26	3.01	NS
Treatment	4	43782	793.16	3.01	Sig**
Error	16	221			
Total	24	44128			

Coefficient of variation CV 5.70, SED 1.49, CD 2.6 , ** significant at p=0.05 level

The larvae were allowed to feed on the leaves for 24 hours. Daily observation on the mortality was recorded up to six days. The results revealed that two concentrations i.e. 2.06×10^{10} and 2.06×10^8 PIB/ml tested were effective against the looper larvae causing 100 percent mortality. The concentrations 2.06×10^6 and 2.06×10^4 PIB/ml exhibited 95.2 and 30.8 mean percent mortality, respectively (Table - 1 and 2). The data were subjected to analysis of variance (ANOVA) using statistical software MINITAB 11.2 and significance of various treatments was evaluated by F test ($p < 0.05$) by calculating CD values.

Of the various insect viruses, Nucleo polyhedron viruses (NPV) are more successful in pest management (Roberts *et al.*, 1991). The efficacy of NPV has been established successfully against many pests in India (Jayaraj and Rabindra, 1990; Muthuswami *et al.*, 1993). This is the first report of occurrence of NPV infecting *B. variegata* loopers from North East India.

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