

Studies with a Virus Disease of Red Hairy Caterpillar *Amsacta albistriga* W. Susceptibility and Gross Pathology

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ABSTRACT

Symptoms and pathology of nuclear polyhedrosis of *Amsacta albistriga* were studied. Caterpillars in advanced stage of infection lost all hair and gave a naked appearance and the colour turned brick red. Infected caterpillars were very restless. The incubation period increased and the mortality decreased as the age increased. Length of infected caterpillars was severely affected by virus infection. The haemolymph turned milky white in caterpillars which were in advanced stage of the disease.

INTRODUCTION

The nuclear polyhedrosis of *Amsacta albistriga* was isolated for the first time from larva collected from the groundnut fields at Pollachi, Coimbatore district by Jacob (1972). Jacob and Subramaniam (1972) described briefly the symptoms and the virus. As the red hairy caterpillar is a very serious pest of groundnut, an attempt was made to understand the host-pathogen relationship which may be important for biological exploitation of the virus in control of the pest in the field.

MATERIALS AND METHODS

From the original stock of virus, different concentrations of virus suspension were prepared with the help of a double ruled Neubauer haemocytometer rulings as described by Lewis (1960). The tests were conducted with caterpillars obtained from eggs of light-collected moths and reared on castor leaves. The caterpillars were made to feed on exposed leaf areas

containing known dosage of the virus inoculum and were removed to virus free folirage immediately after feeding the treated leaf surface. These caterpillars were reared individually in labelled containers. To study the effect of virus on incubation period, twenty five caterpillars from each instar were fed with a dose of 10^6 polyhedra per larva. Observations were made on mortality and incubation period. Effect of different doses of virus on the incubation period and mortality was studied on fourth instar larvae, taking twenty five caterpillars for each dose. Twenty, fourth-instar larvae were inoculated with a dose of 10^4 polyhedra per larva and the length recorded at 24 hours interval. Suitable controls were maintained for all the tests.

RESULTS AND DISCUSSION

Symptomatology: Caterpillars in advanced stages of infection lost all the hair and gave a naked appearance. In some cases the, colour of such

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caterpillars were brick red. The infected caterpillars were very restless roaming at the bottom of the rearing jars. The haemolymph of infected caterpillars turned milky white as the disease advanced. The breaking down of the skin and the subsequent liberation of the body contents that are characteristic of nuclear polyhedrosis as described by Smith (1967) was only a secondary manifestation.

I. Effect of virus on the incubation period of different instars of *Amsacta albistriga*: The results of observations on the effect of virus on the incubation period of different instars are presented in Table 1.

TABLE 1. Incubation period and mortality of larvae infected with virus.

Stage of larvae at treatment instar	Mean incubation period days	Mortality due to NPV (per cent)
2	4.2	96
3	6.5	100
4	9.3	100
5	9.7	76
6	10.4	36

There was no mortality in control. It is evident from the table that younger larvae succumbed to the disease earlier than the older larvae. Similar findings have been reported by Ignoffo and Gracia (1969) and McKinley (1971).

II. Effect of different doses of virus on the incubation period of *A. albistriga*: Table 2 summarises the observations on the effect of different doses of polyhedra on the incubation period and mortality of 4th instar larvae.

TABLE 2. Effect of different doses of virus on the incubation period and mortality of larvae.

Dosage PIB*/larva	Mean incubation period (days)	% mortality due to NPV
10^3	11.50	60
10^4	10.25	100
10^5	9.20	100
10^6	9.00	100

* Polyhedral inclusion bodies

It may be seen from the table that the mean incubation period increased as the dose of polyhedra per larva decreased. For 10^3 polyhedra per larva there was only 60 per cent mortality where as for 10^6 polyhedra per larva it effected 100 per cent mortality. Canerday and Arant (1968) and Jacob (1972) have made similar observations.

III. Effect of virus in the length of *A. albistriga*: The data on the influence of virus on the length of caterpillars is presented in Table 3.

TABLE 3. Length of larvae at different post inoculation periods.

Post inoculation period (hr)	Mean length of larva (mm) ±	
	Healthy	Diseased
24	18.45 ± 0.23	18.15 ± 0.24
48	20.60 ± 0.36	20.15 ± 0.29
72	25.35 ± 0.56	24.70 ± 0.27
96	30.25 ± 0.36	29.60 ± 0.29
120	36.15 ± 0.51	33.45 ± 0.55
144	48.90 ± 0.53	35.90 ± 0.29
168	49.00 ± 0.51	35.65 ± 0.38
192	57.85 ± 0.39	36.00 ± 0.38

The mean length of caterpillars was affected considerably by virus infection as may be seen from the table. The growth of healthy caterpillars was normal with steady increase in length. The diseased larvae showed significant reduction in length five days after ingestion of virus. Reduction in growth of NPV infected caterpillars have been reported by Adams et al. (1968) in *Ceramica picta* and Jacob (1972) in *Spodoptera litura*.

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