Original Research Paper

Volume - 14 | Issue - 04 | April - 2024 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Agricultural Science

A STUDY ON REDUCE SILK PRODUCTIVITY OF ANTHERAEA MYLITTA BY PEST EGG'S PRESENT ON FEED STOCK

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ABSTRACT Silkworm is a domesticated insect having been cultured for a period of over 5000 years (Goldsmith, 1995). It possesses excellent characteristics as an experimental organism. The tropical Tasar silkworm (*Lepidoptera: Saturniidae*) is a sericigenous insect that produces silk (Tasar silk) of high commercial importance. It is a wild polyphagous insect. There are five larval stages which feed on the primary host plant like *Terminalia arjuna* (Arjun plant) and *Terminalia tomentosa* (Asan plant).(Suryanayana and Srivastava, 2005) The Tasar silkworm, scientifically known as *Antheraea mylitta*, is an esteemed insect species that is renowned for its production of the world-famous Tasar silk. Current study finds infestation by insects reduced growth phase of larvae instars stages, reduce Haemolymph presence which affect growing stage of *Antheraea mylitta,* ultimately they fail to reach pupae stage.

KEYWORDS : Antheraea Mylitta, Xanthopimla, Ichneumon Fly, Blepharipa Zebina

INTRODUCTION

Antheraea mylitta or the tropical Tasar silkworm is a species of wild type silk producing moth that is reared for one of the popular silk varieties, i.e. Tasar silk. It feeds on leaves of plants like *Terminalia arjuna* and *Shorea robusta* (Sal tree). Tasar silk has a distinct quality. It has a peculiar colour and a little course to touch. It has higher tensile strength, elasticity and stress relaxation values than the Mulberry silk. Tasar silk moths find their habitat in the dense tropical forests of the central and southern plateau of the Indian Subcontinent. Tasar sericulture is predominantly practiced in the rural areas of Jharkhand, Orissa, Chhattisgarh and West Bengal (Vishakha *et al*., 2019). Indian Silk Industry generated about USD 211 Million foreign exchange in the financial year 2021-22, (PIB, 2022) of which Tasar Silk contributes significantly. In the year 2019-20 Tasar silk accounted for 9.3% of the total silk production (Central Silk Board, 2020). Tasar silk production provides employment to more than 2.5 lakh rural families (Vishakha *et al*., 2019). The quality of silk determines its commercial value and the quantity of quality silk determines the profit from the commercial value. To maintain the quality and quantity of silk it becomes necessary to rare healthy larvae of *Antheraea mylitta* at every stage of development. Apart from the abiotic factors, Tasar silk industry suffers heavily pest due to pest infestation into the silkworm larvae. During the feeding stage they harvest leafs surface contains egg of fly's. The most common pests that infest *Antheraea mylitta* larvae are the Ichneumon fly or Yellow fly (Xanthopimla pedator) and Uzi fly (Blepharipa zebina) (Gathalkar and Barsagade, 2016; Mandal *et al*., 2021). Yellow fly can cause loss of up to 40% to the silk crop (Rath and Sinha, 2005). The female fly infests the host larvae. The eggs hatch and the maggots cross the three instars and develop over 20–25 days (Singh *et al*., 1993); the larva come out from the host and forms the cocoon at the distal end. It has been reported that Uzi fly infestation mostly occurs during rainy season followed by summer season. During winters, Uzi infestation is almost negligible (Sarkar *et al*., 2020). In case of Uzi infestation in Silkworm larvae in third, fourth and early fifth instars the larva die before reaching the spinning stage. Parasite infestation can cause physiological alterations resulting in growth inhibition (Brooks, 1993; Nakamatsu *et al*., 2001; Slansky and Scriber, 1985; Strand and Wang, 1991). Uzi fly infection can cause 100% mortality in case of *Antheraea mylitta* larvae (Rath and Sinha, 2005). This can prove to be drastically dangerous for the silk production. This paper aims to report the maggot infestation of Tasar Silkworm, *Antheraea mylitta*. Good varieties of feed stock (healthy leaves) become essential for gaining quality and quantity of silk production.

MATERIALS AND METHODS:

Sample collection

Silkworm larvae of different growth stages were collected from local plantation site and control plant site treated for pest.

Dissection

The silkworm larvae in third instars were dissected in aseptic conditions. The larvae were first immobilized using 50% alchohol. The larvae were fixed on a parafinned petridish in dorso-ventral position. The organs were dissected out carefully to observe the presence of larvae of insects (Fig 1a). Each time insect larvae was encountered, carefully collected in separate petri dish (Fig1b). Haemolymph was collected from infested *Antheraea mylitta* infested and healthy from same batch, amount of collection was compared. Dissection of control *Antheraea mylitta* 3rd Instar samples feed on treated healthy leafs was found to be infection free.

Microscopic observation

The collected insect's larvae were observed under microscope for any physical evidence for morphological characters change. The observation recorded for more than 50 *Antheraea mylitta* infected with insect larvae.

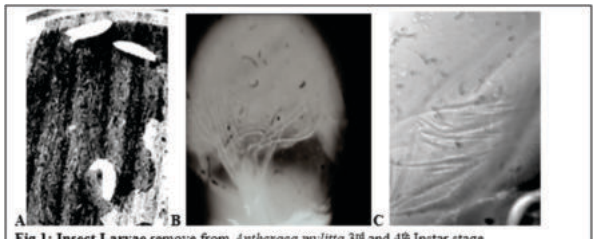

Fig 1: Insect Larvae remove from *Antheraea mylitta* 3rd and 4th Instar stage.
(A) Maggot picked from the dissection of 5th Instar stage of Larvae (B) and (C) Various projections found at Fat bodies and Haemolymph
Source: Bombi Bioscience Pvt Ltd

RESULTS AND DISCUSSION

Upon skillful dissection, it was observed that the larvae were heavily infested with maggots. On an average about 10-15 maggots were found in each silkworm larvae. Average size of live maggots was found to be 5-8 mm with an appearance of rice grain.

The *Antheraea mylitta* larvae infested with maggots were smaller in size despite the time frame of their switch from 3rd to 4th instar. *Antheraea mylitta* larvae appear as in 3rd instar of growth even if they were collected from batch reached 5th instar. This suggests that the larval growth was stopped or extremely slowed down due to the maggot infestation. In some silkworm larvae, the maggots had almost completely sucked up the haemolymph. This resulted in mortality of the infested silkworm failed to reach further stage of life cycle.

CONCLUSION

Reduction of haemolymph content reduces the growth of silk worm. The problem can be reduced by improving on area of production of leaf feed stock free from insects. Planning of production of such treated leaf stock to feed *Antheraea mylitta* larvae might be a challenge for agriculture industry.

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