



Review Article

STEM BORER INFESTATION ON MUGA HOST PLANT SOM (*PERSEA BOMBYCINA*)

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Abstract: Som (*Persea bombycina*) is an important primary food plant for Muga silkworm, *Antheraea assamensis* Helfer. which is denoted by diverse insect pest complex belong to different insect order and family under class of Insecta and phylum of Arthropoda viz. Stem borer, Gall fly, Hairy caterpillar, White ant, Beetle, and some Sucking pest of Aphids and Thrips. Muga silkworm *Antheraea assamensis* Helfer is a widespread to Assam in North Eastern India and is semi cultivated, multivoltine and has enormously part role for growth of sericulture wealth since it is being in golden yellow colour. A vigorous and healthy food plant, good leaf with enough nutrients, Agro climatic condition with suitable environment weather seasons are very much indispensable factors for the growth, development, and improvement of the silkworm and too for the fabrication of high-quality of raw silk. Since this silkworm is rearing outdoor in nature and entirely depend on environment climatic condition, its yield is inhibited by many biotic and abiotic vagaries. One of which stem borer that cause stem damage to the host plant. This stem borer is having different species out of which four species are very perilous which includes *Bactocera titana* Thoms, *Bactocera rufomaculata*, *Xylotrichus* sp., Carpenter moth (*Zeuzera multistrigata* Moore). This piece of writing appraisal strictly focus on stem borer invasion on som plant (*Persea bombycina*) besides covers its biology and management measures of above stem borer.

Keywords: Som (*Persea bombycina*), Muga silkworm (*Antheraea assamensis*), Stem borer, Nature of damage

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Introduction

Muga golden silkworm, (*Antheraea assamensis* Helfer), belong to Saturniidae (Family), Lepidoptera (Order) [1] is an aboriginal species which is particularly available in the North Eastern fraction of India as it is bearing suitable climatic conditions. It is multivoltine in nature with semi domesticated and feeding on different types of host plants. Of which som (*Persea bombycina*) and soalu (*Litsaea polyantha*) are the primary host plant [2]. These plants are scattered plentiful in all north eastern states of India [3]. Further Host plants play very much significant role for growth and development of the silkworm and production of good quality of raw silk. Hence it is extremely much required to manage the invasion of insect pest in the silkworm host plants.

The incidence and occurrence of the pest in the host plants that worsen the quality of leaves more results of which infect the silkworm health which ultimately lead to destroy the superiority and quantity of silk yield. The som plant faced a lot of troubles due to heavy invasion of the Coleopteran and Lepidopteran stem borers which includes *Bactocera titana*, *Bactocera rufomaculata*, *Xylotrichus* sp., Carpenter moth (*Zeuzera multistrigata*). All these stem borer species having its own potential capability to form many bore holes into plant parts after which slow by slow it obliterate the tissues of the plant.

Longhorn beetle (*Bactocera rufomaculata*)

It is one of the major pests of som plant and comes under order of Coleoptera and family Cerambycidae which feeding on many varieties of plants and causing enormous inflict. A single female adult beetle may lay the eggs about in 150-200, white in colour, oval in shape measuring 5 to 7 mm in length and hatching of eggs commence within 10 to 15 days [4].

As soon as hatching is over, the grubs of borer will emerge with creamy in colour and feed under the bark followed by making bore hole in to the tunnel and feed inside sapwood of the trunk. Its live about one year which undergo diapauses (Hibernation) during winter season inside the stem or shoot itself. On attaining of origination of suitable condition when the temperature rises the grubs become active and take pupation inside the stem or shoot itself [5]. The adult beetle is brownish in colour with voracious feeding in nature which emerge during the month of May-June and comes out through the tunnel made. The length of adult beetle is 3-5 cm having a long serrate antenna [6]. Due to presence of many bore holes on the stem or shoot and making tunnel inside them, thereby it will lead to affect the movement of sap flow and affect the foliage of the plant at early stage. At the stage of heavy infestation, the infected plants may apparently show wilting, drying, rupturing occurs during wind hours and finally death of plants. The high-level infestation of the pest could be easily noticed in aged plants as compared to young plants [7].

Greenish yellow beetle *Bactotera titana*, Cerambycidae (Family) Coleoptera (Order).

It is one of the stem borers of som plant which is available all through the year with very less in population whose peak activity period is during July to September month. A female adult beetle will lay the eggs in cracks or on the bark of the plant. Once grub is hatching from the eggs, it starts feeding on the bark which about 2.5 to 4.0 cm in length that requires 5 to 6 months in order to complete the entire growth of the grub. They make a bore hole through the wood in the tree and cutting out large galleries.

Fully matured larvae make large pupation chambers in the tree and stay in the chamber for about 2 to 3 months. These species are greenish-yellow beetle in colour with black markings and have orange spots. The length of the adult beetle is 5.5 cm to 7.5 cm and completes its whole life cycle in one year and having univoltine in nature. The Infected trees shows a greater number of burrows and entrance hole generally enclosed with damaged wood fibers materials and some of the chewed wooden materials could be seen. As infestation is goes severe, gradually they are covering and making big burrows in the entire plant as a result of which the infected wood of plant becomes weak, feeble, drying, retard growth of the plant, fragile, finally main trunk or branches of the tree become fracture and fall down.

***Xylotrichus* sp. Cerambycidae (Family), Coleoptera (Order)**

It is other major stem borer of muga host plants which is also univoltine in nature. This pest could prefer mostly young som plants than older plants. A single female can able to lay about 100 eggs in cracks and crevices of the bark and entire incubation period is 8 to 10 days [7]. The fully-grown grub make bore holes in the stem and pupation takes place inside the tunnel itself. A grub and pupal period of the borer are about 9 months and 28 to 30 days. Due to heavy severe infestation, the infected stem turns into wilt, drying and branches of the plant smash easily.

Black Headed moth borer (*Zeuzera multistrigata*) Zeuzeridae(Family), Lepidoptera (Order)

It is a Lepidopteran borer and being univoltine in nature. The head and antennae of the borer are black in colour. The thorax of adult moth is bearing three pairs of blue-white spots and presence of seven black bands on the abdomen. The female moth may lay the eggs underneath bark or around a tunnel. No sooner than hatching the larvae, it chews the tree trunk. Since the larvae have many instars and habit of migration in nature, it moves between trees many times. Hence a very little population even could make massive damage at great level to the plants. As far as feeding habit concerned, the early instars feed on the phloem part while the late instars feeds on the hardwood of the plant.

Management measure of stem borer on som plant ecosystem

Since they are feed on internally of the plant, it is very intricated process to manage them. Proper field sanitation and cleanliness can be encouraged. Cultural practices should be followed in the plantation area where the plants are grown [8]. Alternative host plant may be removed if available near to vicinity area as it is harboring for abode of pest population. A periodical Collection and destruction of eggs before hatching and dispose them [9]. A Light trap can be effectively installed in the field at an assortment of places to draw adult in order to minimize the population. As the chemical control method is not advisable in muga host plant as it will cause residual effect on the plant and when the silkworm larvae feed on treated leaf, it will die. Lime powder can be applied as much as possible as per recommendation below the portion of plant [10]. An Entomopathogenic nematodes (EPNs) should be used for effective control of the pest [11].

Conclusion

Since Muga silkworm is being naturally golden yellow colour silk due to which it has a huge demand in the sericulture commerce. In order to complete a successful life cycle of muga silkworm and production of high yield of raw silk, the factors like Environment and suitable agro-climatic condition, good quality, and healthy seed, healthy host plants are the primary very much painstaking. Among factors concerned, a host plants factor is playing a very important fundamental role in growth and improvement of the silkworm larvae. But recent explore revealed that diverse insect pest is attacking and causing heavy infestation to the host plant thereby leading main constraint for muga culture. Since a Stem borer is one of the severe insects among the insect pests infesting som plant, So, a special concentration is very much required for safeguard of host plant from sever incursion of stem borer.

Application of research: Biology and management measures of stem borer

Research Category: Sericulture, Plant Entomology

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