



ISSN : 0973-7057

## Study on insect pest of *Solanum melongena* L. and their natural enemies in Ranchi Jharkhand

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Received : 28<sup>th</sup> May, 2023 ; Revised : 29<sup>th</sup> June, 2023

DOI:-<https://doi.org/10.5281/zenodo.13346294>

**Abstract-** Insect pests cause major economic loss in vegetable cultivation. Collection of insect pests of brinjal were done during 2018 - 2020. Climatic factors affect the growth of the plant as well as the pest also. During the field study period aphids, jassids, mealybugs, shoot and root borers, beetles and their natural enemies were collected. Some were reared in laboratory conditions. Larvae of *Leucinodes orbonalis* was observed as highly infectious pest. It may be categorised as major pest of brinjal.

**Key words:** Pest, Infectious, natural enemies, Shoot and fruit borer

### INTRODUCTION

Brinjal (*Solanum melongena*) L. is an important vegetable crop in almost all states of India. Insect pests cause much damage to this vegetable and cause major economic loss to the farmers. Damaging roots, stem, leaves flowers and fruits cause stunted growth of the plant as well as unhealthy fruits. Abhishek (2021)<sup>1</sup> reviewed the integrated management of brinjal shoots & root borer, *Leucinodes orbonalis* (Guenee) Anjali, (2012)<sup>2</sup> reported seasonal incidence and effect of abiotic factors on population dynamics of major insect pests on brinjal crop. Bindu and Pramanik (2017)<sup>3</sup> reported on occurrence of insect pests and their natural enemies on brinjal under agroclimatic conditions of Gayeshpur, West Bengal. Gangwar *et al.* (2014)<sup>4</sup> studied on insect pests' succession of brinjal crop ecosystem in western region of Uttar Pradesh. Kaur (2014)<sup>5</sup> reported on population dynamics of brinjal fruit and shoot borer *Leucinodes orbonalis*

Guenee (Lepidoptera: Crambidae) under agroclimatic conditions of Hisar, Haryana, India. Kumar (2014)<sup>6</sup> studied on Pest complex of leaf feeding insect at eggplant (*Solanum melongena*) and their relation to meteorological conditions. Kumar (2019)<sup>7</sup> reported on abundance of insect pests associated with brinjal (*Solanum melongena* L.) crop. Madhu (2019)<sup>8</sup> studied on brinjal insect pests and its management at garden experiment. Manish G. (2019)<sup>9</sup> studied on management of brinjal fruit and shoot borer *Leucinodes orbonalis* Guenee in Nepal. Mondel *et al.* (2014)<sup>10</sup> reported the impact of weather factors on population abundance of brinjal fruit and shoot borer. *L. orbonalis* (Guenee) in West Bengal. Mandeep (2018)<sup>11</sup> reported on Emerging Insect Pests in Indian Agriculture. and Omprakash (2014)<sup>12</sup> gave a brief review on abundance and management of Major insect pests of Brinjal *Solanum melongena*. Sathe *et al.* (2014)<sup>13</sup> studied on ecology and control of Brinjal Insect pest from Kolhapur region Soren (2020)<sup>14</sup> studied on the succession of insect pests of brinjal.

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## **MATERIALS & METHODS**

A field survey was done in Kanke block (Pithoria and nearby villages) and Khunti vegetable fields specially brinjal cultivated areas to study the insect pest status in these areas. Some areas were selected for study and collection. The fields were visited regularly once a week and incidence of infestation of insect pests were recorded. The insect pests were photographed and collected by using aspirator, pit fall trap and by insect net. Specimens were killed by using chloroform and ethyl acetate. Small insects preserved in 70% ethanol in plastic vials. Moths and large insects were preserved by drying, spreading and proper pinning.

Some specimens brought in the laboratory for rearing. Appropriate food given to study their life cycle. The insects were kept in glass jars and beakers. Mouth of the jar and beaker closed with muslin clothes. Some parasites found during rearing which acted as natural enemies.

The collected insects and natural enemies were identified by consulting appropriate literature and internet.

## **RESULT & DISCUSSION**

The study on pests of brinjal was done during 2018 - 2020 and it was found that many insects infest the brinjal plant. Almost all the plant parts were infested by the different insect species. 13 species of insect pests and 2 species of predators were observed. *Leucinodes orbonalis* (Crambidae : Lepidoptera) was found in young tender shoots, at the apex of shoots and the effect causes withering and drying of the plant as the pest is shoot and fruit borer. The leaf roller *Eublemma olivacea* (Noctuidae : Lepidoptera) is very infectious throughout the plant life. Nymph and adults of Aphids are sap sucker. When the no. of aphids is too much the plant show no proper growth and leaves are wrinkled. *Spodoptera litura* (Noctuidae : Lepidoptera) is a serious polyphagous pest. It causes heavy damage to many plants including brinjal. The adult is a dark brown moth with white line on its wings. Larva has bright yellow lines on the back and on the sides of the body. Light green eggs are laid on the underside of leaves. Larva eats the whole part of the leaf and only the veins are left over. *Disdercus koeniggi* Fab. (Pyrrhocoridae: Hemiptera) is a serious pest of cotton crops, but they also infest the brinjal plant, where they are present. It is a sap sucker. *Nazara viridula* (Pentatomidae : Hemiptera) also called green stink bug is a polyphagous pest, found infesting the brinjal plant. It is

also a sap sucker. *Myloccerus subfasciatus* (Ash weevil) (Curculionidae : Coleoptera) notch the leaf margin. Eggs are laid in soil. Grubs feed on roots causing wilting of plants. Grubs are small in size and the larval period is 4-6 weeks. After full growth it pupates in soil in earthen cocoons. Adult is brown in colour and lives for 1-2 weeks. *Leptocentrus taurus* Fab ( Membracidae : Hemiptera) is a sap sucker. When present in more number, it causes damage to growth of leaves. *Amarasca biguttula biguttula* and *Nephotettix depunctatus* Fab (Cicadellidae :Hemiptera), commonly called leafhoppers is a polyphagous pest comes under Hemiptera (Homoptera). It is also a sucking pest, causes considerable damage to brinjal crop. Both nymphs and adults of this pest suck the sap from the lower surface of the leaf and growing tip. *Epilanchna punctata* Fab (Coccinelidae : Coleoptera) damaged the leaves just after transplanting the seedlings and throughout the crop period. The larvae of serpentine leaf miner feed under the surface of leaves. Feeding causes loss of healthy leaf tissues. The larvae actually live in the leaf, between the outer skin layers. Leaf minor damage is easily recognised. Mealy bugs infestations were found highest during all the crop period. It is a polyphagous pest and damages the crop too much as it is a sap sucker and crinkling of leaves clearly shows the weakening of plant and stunted growth. The leaves become yellow and young shoots and branches die. If the population of mealy bug is too much, it has a tendency to be a major pest.

Some predators are found which acts as natural enemies. Ants found to attack the aphids and mealy bugs. Some coccinelids (ladybird beetle) are important beneficial predatory insect. Both adult and larvae feed on aphids, mites, small insects and insect eggs.



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*Leucinodes orbonalis* Guenee Different stages of life cycle



*Aphis gossypii*, Glover



*Leptocentrus Taurus* Fab

Table 1- List of pests recorded during 2018 - 2020

Sl.No.	Common Name	Scientific Name	Family	Order
1.	Shoot and fruit borer	<i>Leucinodes orbonalis</i> Guenee	Crambidae	Lepidoptera
2.	Leaf roller	<i>Eublemma olivacea</i>	Noctuidae	Lepidoptera
3.	Tobacco caterpillar	<i>Spodoptera litura</i> Fab.	Noctuidae	Lepidoptera
4.	Red cotton bug	<i>Disdercus koeniggi</i> Fab.	Pyrrhocoridae	Hemiptera
5.	Aphid	<i>Aphis gossypii</i> . Glover	Aphididae	Hemiptera
6.	Green stink bug	<i>Nazara viridula</i> L.	Pentatomidae	Hemiptera
7.	Ash weevil	<i>Myloccerus subfasciatus</i>	Curculionidae	Coleoptera
8.	Cow bug	<i>Leptocentrus taurus</i> Fab	Membracidae	Hemiptera
9.	Leaf hopper	<i>Amarasca biguttula biguttula</i>	Cicadellidae	Hemiptera
10.	Leaf hopper	<i>Nephotettix depunctatus</i> Fab	Cicadellidae	Hemiptera
11.	Beetle	<i>Epilanchna punctata</i> Fab	Coccinelidae	Coleoptera
12.	Serpentine leaf miner	Unidentified	-----	Diptera
13.	Mealy bug	Unidentified		Hemiptera

CONCLUSION

About 13 species of insects found during the present investigation and in was found most of the insects are minor pests. They have a potential to become a major pest if not controlled within time. But the natural enemies are sufficient to control these.

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