Outbreak of Mango Red-banded Caterpillar (*Deanolis sublimbalis*) in Bihar

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Mango red-banded caterpillar is one of the destructive pests of mango fruits and its outbreaks have been occurring in Bihar during the last few years. Though it has been reported in India since long ago, its geographical distribution largely restricted to the eastern coast of India. The main damage is caused by larvae which bore into fruits and feed on flesh and seed. During the last few years, it has spread to almost all mango growing districts of Bihar, including Muzaffarpur, Sitamarhi, Samastipur, Darbhanga, Bhagalpur, Banka, Munger, Jamui, Sheikhpura and Motihari, causing huge economic loss. It can be effectively managed by applying thiacloprid insecticide.

Introduction

Mango red-banded caterpillar (MRBC) (Pyralidae: Lepidoptera), *Deanolis sublimbalis* Snellen, is one of the destructive pests of mango fruits in tropical parts of Asia rendering considerable damage. Mango (*Mangifera indica* L.) fruits are the primary host of the MRBC but it also has wild hosts such as coco grass or nut grass, *Cyperus rotundus* (Family: Cyperaceae) and kwini/kurwini mango, *Mangifera odorata* Grifth (Family: Anacardiaceae). It is a designated quarantine pest and has recently assumed serious status in the Indian states of Andhra Pradesh, Odisha, and West Bengal. Besides India, it is distributed throughout the tropical regions of South and South-East Asia including Indonesia, Papua New Guinea, Burma, Thailand, China, Brunei, Philippines, and some parts of Australia. The population initiates during third week of February and incidence remains moderate up to second week of March. The pest population then increases gradually and attains the maximum level of abundance during first week of April with up to 9% fruit infestation. The population decreases during second week of May. The eggs are white to crimson, laid in groups of up to 15 on the fruit stalk, or more rarely on the base of the fruit or in crevices, such as spots caused by the anthracnose fungus, *Colletotrichum gloeosporioides*. The incubation period is about 10 days and the first instars bore together into the side of the fruit and feed beneath the skin. Several larvae can occur in the same fruit, but usually they disperse and only one larva tunnels into the seed. When mature, the larva is white with a brown or black head, up to 2 cm long, and has 11 bands along the back (Fig. 1A), pink at first and then red. The five larval stages occur over approximately 16 days, and then pupation occurs on the ground or in or under the bark. It lasts up to 14 days before the adults emerge; they are greyish/pale brown, 12 mm long, and nocturnal. It completes its life cycle within a month and has 3-4 generations per year. It undergoes pupal diapause in the trunk of mango and emergence of adults is triggered by the onset of flowering.

The main damage is caused by larvae which tunnel into the flesh. As the larvae mature, they penetrate further into the kernel and feed on the seeds. Usually, first and second instar larvae feed on flesh and third to fifth feed on the seed. The presence of fluid oozing from the holes made by the larvae through the skin is a common sign (Fig. 1B). This fluid drips to the tip of the

fruit and accumulates. Although it is almost clear when fresh, the liquid darkens and appears as a black streak on the skin forming a black spot at the tip of the fruit. Early symptoms of infestation include small darkened boreholes on the fruit caused by the entry of larvae. These holes are usually filled with frass which lead to rotting and also provide entry point for pathogens which cause secondary infections. For instance, a damaged fruit may be attacked secondarily by fruit flies or various decaying organisms and may fall off prematurely. When an attacked fruit is cut open to expose the inside of the seed, the larvae are likely to be seen tunnelling in the seed, but can also be present in the flesh.

A **B**

Fig. 1. Mango red-banded caterpillar: **A.** Larva **B.** fluid oozing from the holes made by the larvae

Outbreak in Bihar

In 2021, due to continuous change in the weather of Bihar, the mango farmers were worried a lot as their mango crops were hit by red-banded caterpillar. Due to the prolonged period of moisture in the air, there has been an outbreak of this pest on the mango crops. Young fruits are particularly susceptible as fungi invade them and make them rot. Sticky liquid exudes from the larval entry hole, dribbles down the fruit as a dark stain and collects at the base due to which cracks appear on the fruits at the entry hole destroy the crops.

When the flowering turns into young fruits, red-banded mango caterpillar starts appearing, spoiling the fruits completely. The caterpillars are leaving a sticky honey-like substance which hinders the process of photosynthesis in the plant. Dark stains on the sides of the fruit are formed from liquid oozing out of the entry sites made by the caterpillars of the red-banded mango caterpillar.

In 2021, most of the time in Bihar, moisture remained in the air due to continuous changes in the weather, which led to the outbreak of this insect. The problem of this pest came to light in many areas including Muzaffarpur, Sitamarhi, Samastipur and some other districts. This was not the case till a few years ago, but in 2020 it was seen only in some areas of Darbhanga district.

Mango growers in Bhagalpur district, famous for *Zardalu* mangoes, were also worried about the red-banded mango caterpillar affecting mango production in 2019. In 2018, some cases were reported from Kahalgaon and Jagdishpur blocks. In 2019, however, the red banded mango caterpillar was visibly affected all varieties in whole district. It has been estimated that up to a

tenth of the output may be lost because of this pest. The red banded mango caterpillar also affected mango crops in 2014 and 2015. It was assumed to be sporadic earlier; but in the last few years it seems to be a major pest of the region in Bhagalpur, Banka, Munger, Jamui, Sheikhpura, especially in some blocks like Nathnagar, Kharik, Sultanganj, Sabour and Bausi. All mango varieties have been attacked, including Maldah, Bombay, Zardalu, Gulabkhas, Phajli, Ranipasand, Shankarbhog and Beeju (Desi). In 2022, infestation of this was also reported from Motihari district on a large scale.

Management

Natural enemies

Egg parasitoids, such as *Trichogramma chilonis* and *T. chilotraeae* have been recorded. The weaver ant, *Oecophila smaragdina*, is a predator of the moth, although it is said not to feed eggs or larvae.

Cultural control

During growth, bag individual fruits and remove and destroy fruits with black stain that are likely to contain larvae in the flesh or seed. Sticky bands can be used around the tree trunks to prevent the entry of MRBC larvae. After harvest, collect and destroy dried branches and other dead wood in mango orchards in the off-season.

Chemical control

Use Neem at an interval of 10 days, starting when the mango trees are flowering and continuing for 2 months. Thiacloprid is effective insecticide against this insect. Note that residue data are required for chemical insecticides before recommendations can be made.

Conclusion

The mango red-banded caterpillar has spread to almost all mango growing districts of Bihar. It has become very essential to control it in time. Sprays recommended by horticulturists should be used timely before the larvae enter the fruits.