

Swarming Caterpillar, *Spodoptera mauritia*

(Noctuidae: Lepidoptera) – A resurrecting pest in rice ecosystem

Guru Pirasanna Pandi G, Basana Gowda G, Totan Adak and P C Rath

ICAR-National Rice Research Institute, Cuttack, Odisha 753 006

Swarming Caterpillar earlier considered as a sporadic pest and cause substantial damage to the crops in the southern part of the Indian contingent, but since 2000, in the eastern and north eastern part of the country its outbreak has occurred five-times. In the context of changing climatic scenario, this pest needs to be monitored on time otherwise it may hamper the rice yield.

Keywords: Pest in rice ecosystem, Rice crop, Swarming Caterpillar

ARMYWORMS are the caterpillars that attack rice crop. There are at least three armyworm species that attack rice in Asia. These are the rice swarming caterpillar *Spodoptera mauritia* (Boisduval), common cutworm *Spodoptera litura* (F.), and the rice ear-cutting caterpillar *Mythimna separata* (Walker). Among them, swarming caterpillar is earlier believed to be a sporadic pest which intermittently causes some losses (below 20%) to rice crop in Indian continents and other parts of Asia, but from the last decade onwards it has emerged as a major pest in eastern India and caused severe losses to wet season rice production. During 2009 and 2010, a severe outbreak of swarming caterpillars occurred in Odisha (especially Sambalpur and Sundergarh district) over thousands of hectares that led to complete devastation of paddy in farmer's fields and the crops looked as it was completely grazed by cattle. Similarly in 2013, a major outbreak of swarming caterpillar was experienced over 100 ha of paddy field in Assam (Bajali and Pakabetbari block in Barpeta district) and caused 80-100% damage. Recently, during 2016 also again in Assam an outbreak of armyworm was observed in paddy fields (Table 1). The insect

is polyphagous in nature and attacks various graminaceous crops as well as weeds, but upland rice is its preferred host.

S. mauritia was first identified from Hawaii in 1899 as armyworm in nutgrass (*Cyperus rotundus*) where it was also found infesting rice. In India, this pest was first reported from Tamil Nadu in 1935 by Ananthakrishnan and Ramakrishna Ayyar. Later on it was also reported from Kerala (1943) and Odisha (1952). It is widely distributed throughout the Indian subcontinent, East and Southern Asia and the Australian region. In South India, it is common in all the rice growing tracts, especially in Tamil Nadu and Kerala. This pest is also recorded from Jharkhand, Bihar and Chhatisgarh during *kharif* rice crop in 2008 and 2009 and other countries

like Afghanistan, Australia, Bangladesh, Bhutan, Burma, Fiji, Guinea, Hawaii, India, Indonesia, Kampuchea, Korea, Laos, Madagascar, Malaysia, Marquesas, Mauritius, Myanmar, Nepal, New Zealand, Pacific Islands, Pakistan, Papua New Guinea, Philippines, South China, South East Asia, Sri Lanka, Tahiti, Taiwan, Tanzania, Thailand, Uganda and Vietnam.

Favourable factors for outbreak

Prolonged dry condition followed by heavy rainfall. Presence of alternate host.

Adult lays more eggs when the maximum temperature is at 15 °C. Plants are more fertilized. Wind and rain storm helps in migration of moths to long distances. Pest migrates from older rice to grassy areas for off-season survival (Fig. 1).

Table 1. Outbreak status of swarming caterpillar

Year	Area affected	District/States
1993	Not Available	Tamil Nadu
1999	250 ha	Kotma Block/ Central India
2007	50 ha	Tangi Block/ Cuttack/Odisha
2008	150 ha	Sonepur/Odisha
2009	1.25 lakhs ha	Odisha
2013	100 ha	Assam
2016	17,418 ha	Assam

Plant name	Family
Nut grass, <i>Cyperus rotundus</i>	Cyperaceae
Brassicaceae (cruciferous crops)	Brassicaceae
Gossypium (cotton)	Malvaceae
<i>Oryza sativa</i> (rice)	Poaceae
Poaceae (grasses)	Poaceae
<i>Saccharum officinarum</i> (sugarcane)	Poaceae
<i>Zea mays</i> (maize)	Poaceae
Safed Musli, <i>Chlorophytum</i> sp.	Liliaceae

Damage

Earlier, rice plants in the nursery beds were severely affected by Swarming caterpillars, but recent observations revealed that it also attacking the transplanted crop. Armyworm damages the rice plants by cutting off young seedlings and leaves. They can also cut off rice panicles from the base. This pest is nocturnal in nature, so the larvae usually feed in the upper portion of the rice canopy at night or on cloudy days; while the adult feeds, mates, and migrates at night and rests in the daytime at the base of the plant. They appear suddenly in masses and move like an army from field to field so that seedbeds or the direct-seeded fields look as if grazed by cattle. Newly hatched larvae cause the plants to look sickly with withered tips and cut leaves, but older larvae (more than 10 d old) feed voraciously and almost completely defoliate the plants. They migrate from field to field and extensive losses are often caused within 1 week. The absence of standing water in the fields facilitates its migration.

Diagnostic symptom

Armyworms feed mainly on the leaf tips along leaf margins. They eat whole leaves completely or leave only the midribs. Armyworm damage can be mistaken for cutworm feeding. Cutworm usually cut the plant from the base whereas armyworms completely remove the leaves, so the stem portion only may remain. To confirm, check for the presence of the insect and its egg mass or pupae. In dry land fields, armyworm pupa can be found in the soil or at the base of the rice plants. In wetlands, they pupate on the plants or on grassy areas along the field borders.

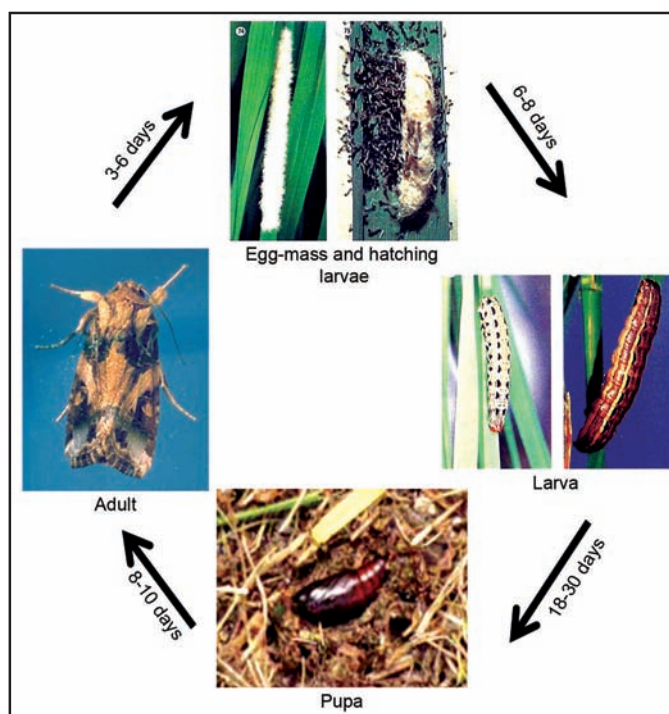


Fig. 1. Lifecycle of swarming caterpillar, *Spodoptera mauritia*
Source: CRRRI training Manual on Rice Insect Pest and Diseases

Biology

The pest is active throughout the *kharif* season but its damage is noticeable in the early part, especially after good rains when it appears in the form of a true army worm. There may be three or four brood in a season and generally the second brood is most dangerous. The period of development as follows: Egg – 6-8 days, Larva- 18-30 days, pupa – 8-10 days and adult longevity – 3-6 days.

Integrated Pest Management

Monitoring

As this insect pest started appears during the month of May, proper monitoring should be taken from April onwards with light trap @ 1/ acre.

Cultural control

Deep-summer ploughing exposes the hidden larvae and pupae present in the soil. Crop rotation with non-host crop will check the attack of this caterpillar. Destroy the alternate hosts and the excess nurseries after transplanting. Flooding the nurseries and small fields will expose the larvae

to birds. Herd of ducks can easily destroy these caterpillars if let in to the fields. Digging a drench around the infested field will avoid the movement of larvae from one to another field.

Mechanical Control

Light trap could be useful for mass trapping besides monitoring. Apply of 2L kerosene per hectare, and then shake the plant vigorously with the long rope stretched across the field. So that the larvae fall into the kerosenized water and ultimately die.

Biological Control

Release egg parasitoid, *Telenomus* spp. or larval parasitoid, *Apanteles* spp.

@ 1 lakhs per ha. Keep bamboo perches which facilitate predation by birds. In Hawaii, NPV has recorded against this pest, so there is a need to identify the native NPV strain which may provide very good control against swarming caterpillar.

Chemical Control

Spraying should be done at an early stage to get effective result. Application of Malathion 2% dust @ 25 kg/ha or Chlorpyrifos 1.5% dust @ 25 kg/ha along the bunds of the field which facilitate to kills the pest and also prevents the migration of larvae. Spray of Chlorpyrifos 20 EC @ 2.5 litres/ha or Quinalphos 25 EC @ 2.0 litres/ha or Triazophos 40 EC @ 1.0 litres/ha or Dichlorvos 76 SL 600 ml/ha on the paddy crop in the evening hours. Spray newer insecticides like Chlorantraniliprole 18.5 sc @ 100-150 or Flubendiamide 480SC @ 100-150 ml/ha on the paddy crop in the evening hours.

Corresponding
directorcrricuttar@gmail.com

e-mail:

Access Digital Copies of Indian Farming at <http://epubs.icar.org.in/ejournal>