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Pests and Predators of Tropical Tasar Silkworm and Host Plants

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This article discusses the various pests and predators affecting tropical tasar silkworm (*Antheraea mylitta*) and its primary host plants such as Arjun and Asan. Due to outdoor rearing conditions, the silkworm is highly exposed to endo-parasitoids like uzi fly and ichneumon fly, insect predators such as bugs, wasps, and ants, as well as vertebrate predators including birds and lizards. The article also examines pests of host plants that reduce leaf quality and availability, thereby affecting silkworm growth and cocoon production. Seasonal pest incidence, pest dynamics, and their economic impact are highlighted, with losses reaching up to 80–90% under severe conditions. Emphasis is placed on integrated pest management strategies, including cultural, mechanical, biological, and chemical methods, to minimize damage and ensure sustainable tasar silk production.

Introduction

Tropical tasar sericulture is primarily based on the rearing of the silkworm *Antheraea mylitta* under outdoor conditions on natural host plants such as Arjun (*Terminalia arjuna*) and Asan (*Terminalia tomentosa*). Due to open rearing in forest ecosystems, the silkworm and host plants are highly exposed to a wide range of pests, parasites, and predators, which significantly affect cocoon production. According to CSB-CTR&TI studies, pest and predator attack is one of the major causes of crop loss, sometimes contributing to 80–90% reduction in yield when combined with diseases and environmental factors.

Pests and Parasites of Tropical Tasar Silkworm

Pests of tasar silkworm include endo-parasitoids and ecto-parasites that directly affect larval and pupal stages.

Endo-parasitoids (Internal parasites)

These are the most destructive pests as they develop inside the silkworm body.

Major Parasites

- Uzi fly (*Blepharipa zebina*): Attacks 3rd to 5th instar larvae, Causes 10–40% crop loss
- Ichneumon fly (*Xanthopimpla pedator*): Attacks spinning larvae, Causes 10–48% loss
- Dermestid beetle (*Dermestes ater*): Damages cocoons and pupae
- Nematode (*Agamermis mylittensis*): Infects larvae, reducing survival

Mode of Damage

- Lay eggs on or inside larvae, Maggots consume internal tissues, leads to weak cocoons or death before spinning

Insect Predators (External attackers)

These predators feed directly on silkworm larvae.

Major Insect Predators

- Stink bug (*Eocanthecona furcellata*)
- Reduviid bug (*Sycanus collaris*)
- Wasp (*Vespa orientalis*)

- Praying mantis (*Hierodula bipapilla*)
- Red ants (*Oecophylla smaragdina*)
- Black ants (*Myrmicaria brunnea*)

These predators mainly attack early larval stages (1st–3rd instars) and cause 5–30% losses depending on severity.

Nature of Damage

- Direct feeding on larvae, cutting and carrying larvae, disturbing feeding and growth

Non-Insect Predators

These include vertebrates that prey on larvae and cocoons.

Major Non-Insect Predators: Birds (crow, treepie, hawk cuckoo), Lizards (garden lizard), Squirrels, Rats

Damage Pattern: Birds consume larvae (especially 3rd–5th instar), Lizards feed on young larvae, Squirrels and rats damage cocoons and pupae by cutting shells

Seasonal Occurrence and Pest Dynamics

Pest incidence depends on the interaction of three factors:

- Host (silkworm)
- Pest (parasite/predator)
- Environment (temperature, humidity)

This is known as the "pest triangle concept."

- Peak pest incidence occurs when all three factors are favorable
- Seasonal peaks:

✓ Uzi fly: Oct–Jan

✓ Wasps and bugs: rainy to post-rainy season

Pests of Tasar Host Plants

Healthy host plants are essential for good cocoon production. The main host plants include:

- Arjun (*Terminalia arjuna*)
- Asan (*Terminalia tomentosa*)

Host plants are attacked by various insect pests, which reduce leaf quality and quantity.

Major Host Plant Pests

Although detailed species lists vary, common pest groups include:

a) Defoliators: Caterpillars and leaf-eating insects, Cause heavy leaf loss, reducing food availability

b) Bark eaters bore into stems and branches and affect plant growth and vitality

c) Sap feeders: Suck plant sap, causing leaf curling and drying

d) Gall insects: Form abnormal growths (galls) on leaves and stems

Impact: Reduced leaf yield, Poor nutritional quality, Lower silkworm growth and cocoon quality

Economic Impact of Pests and Predators

- Uzi fly and ichneumon fly: 10–48% loss
- Predators (bugs, ants, wasps): 5–30% loss
- Birds: up to 40% loss in severe cases
- Overall crop loss can reach 80–90% when unmanaged

Management Strategies

Cultural Practices

- Selection of proper brushing date and direction
- Maintenance of optimal microclimate
- Clean rearing fields and host plants

Mechanical Control

- Removal of ant nests
- Manual collection of pests
- Use of nylon nets to protect young larvae

Biological Control

- Use of Leaf Surface Microbes (LSM) for disease suppression
- Encouraging natural enemies

Chemical Control

- Limited use of insecticides (e.g., methyl parathion for ants)
- Use of botanical pesticides for eco-friendly management

Preventive Measures

- Continuous watch and ward during rearing
- Protection of host plants
- Pest forecasting and early warning systems

Conclusion

Pests and predators are major limiting factors in tropical tasar sericulture due to the outdoor rearing system. Both silkworms and host plants are vulnerable to a wide range of biological enemies, including parasitoids, insect predators, and vertebrates. Effective management through integrated approaches—combining cultural, biological, and mechanical methods—is essential to minimize losses and ensure sustainable tasar silk production.

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