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Avian Pests of Tasar Silkworm (*Antheraea mylitta*) in Major Tasar Rearing Districts of West Bengal: A Farmer-Based Survey

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Tasar sericulture is an important forest-based livelihood activity in eastern India. The tropical tasar silkworm (*Antheraea mylitta*) is reared outdoors on host plants such as Arjun (*Terminalia arjuna*) and Asan (*Terminalia tomentosa*). However, the open rearing system exposes silkworm larvae to several natural enemies including avian predators. The present study documents the diversity of birds attacking tasar silkworm larvae in four major tasar producing districts of West Bengal: Birbhum, Bankura, Purulia and Jhargram. Particular emphasis is given to winter season migratory birds such as the Great Grey Shrike, Eurasian Wryneck, Pied Bushchat, Barn Owl and Siberian Rubythroat along with resident birds including House Crow, Black-headed Oriole, Golden Oriole and Rufous Treepie. A questionnaire survey of 120 tasar farmers was conducted to understand the incidence of bird predation and the management practices adopted by farmers. The results indicate that bird predation mainly affects middle and late instar larvae and is more severe during the winter season. Traditional control methods such as scarecrows and reflective materials are commonly used, while modern protective methods are less frequently adopted.

Keywords: Tasar sericulture, avian pest, *Antheraea mylitta*, migratory birds, West Bengal, predator management

Introduction

Tasar silk is one of the most valuable wild silks produced in India and plays a significant role in rural and tribal economies. The tropical tasar silkworm (*Antheraea mylitta*) is primarily reared on forest host plants such as Arjun (*Terminalia arjuna*) and Asan (*Terminalia tomentosa*). Unlike mulberry sericulture, tasar rearing is conducted in open forest environments, making silkworm larvae vulnerable to various natural enemies. Among these natural enemies, birds are considered one of the most important predators of tasar silkworm larvae. Birds feed on caterpillars and other insects present in forest ecosystems and therefore often prey on silkworm larvae during feeding periods. Bird predation becomes more significant when larvae reach middle and late instar stages because larger larvae are more visible and contain higher nutritional value. In the state of West Bengal, tasar rearing is practiced in several districts including Birbhum, Bankura, Purulia and Jhargram. These regions contain dry deciduous forests that support diverse bird populations. During winter season, several migratory bird species also visit these areas, increasing the diversity of avian predators. Understanding the diversity of avian predators and their impact on tasar silkworm populations is important for developing effective pest management strategies. Therefore, the present study aims to document avian pests of tasar silkworm and analyze farmer observations regarding bird predation in major tasar producing districts of West Bengal.

Materials and Methods

Study Area

The study was conducted in tasar rearing fields located in four districts of West Bengal:

- Birbhum
- Bankura
- Purulia
- Jhargram

These districts contain large plantations of Arjun and Asan host plants used for tasar silkworm rearing.

Data Collection

Data on avian pests were collected using two methods:

1. **Field observations** of bird activity in tasar rearing fields.
2. **Questionnaire survey of tasar farmers.**

A total of **120 farmers were interviewed**, including **30 farmers from each district**.

Questionnaire Design

A set of ten questions was prepared to obtain information on bird predation patterns, larval stage affected, seasonal occurrence and control methods used by farmers.

Table 1 Questionnaire Used for Farmer Survey

Sl. No	Question
1	Which bird species are commonly observed in tasar rearing fields?
2	Is bird attack more common during winter season?
3	Which stage of silkworm larvae is most affected by birds?
4	Do migratory birds appear during tasar rearing season?
5	Do birds cause significant crop loss in tasar fields?
6	At what time of the day do bird attacks occur most frequently?
7	Do farmers use traditional bird deterrent methods?
8	Are protective nets or barriers used to prevent bird attacks?
9	Does bird attack vary depending on plantation location?
10	What additional measures do farmers suggest for reducing bird damage?

Table 2: Avian Species Recorded as Predators in Tasar Rearing Fields

No	Bird Name	Scientific Name	Status	Peak Season of Predation	Months of Activity	Instar Attacked
1	Great Grey Shrike	*Lanius excubitor*	Winter Migratory	Winter	Nov–Feb	Late
2	Long-tailed Shrike	*Lanius schach*	Resident	Monsoon–Winter	Jul–Feb	Middle–Late
3	Brown Shrike	*Lanius cristatus*	Winter Migratory	Winter	Oct–Feb	Middle
4	House Crow	*Corvus splendens*	Resident	All seasons	Jul–Feb	Late
5	Large-billed Crow	*Corvus macrorhynchos*	Resident	All seasons	Jul–Feb	Late
6	Rufous Treepie	*Dendrocitta vagabunda*	Resident	Monsoon–Winter	Jul–Jan	Late
7	Black Drongo	*Dicrurus macrocercus*	Resident	Monsoon	Jun–Sep	Early
8	Ashy Drongo	*Dicrurus leucophaeus*	Winter Migratory	Winter	Oct–Feb	Early
9	Bronzed Drongo	*Dicrurus aeneus*	Resident	Monsoon	Jun–Sep	Early
10	Greater Racket-tailed Drongo	*Dicrurus paradiseus*	Resident	Monsoon–Winter	Jul–Dec	Early
11	Indian Roller	*Coracias benghalensis*	Resident	Monsoon	Jun–Sep	Middle
12	White-throated Kingfisher	*Halcyon smyrnensis*	Resident	Monsoon	Jun–Sep	Middle
13	Green Bee-eater	*Merops orientalis*	Resident	Monsoon	Jun–Sep	Early

14	Blue-tailed Bee-eater	*Merops philippinus*	Summer Migratory	Monsoon	May–Sep	Early
15	Common Myna	*Acridotheres tristis*	Resident	All seasons	Jul–Feb	Middle
16	Bank Myna	*Acridotheres ginginianus*	Resident	Monsoon	Jul–Oct	Middle
17	Jungle Myna	*Acridotheres fuscus*	Resident	Monsoon–Winter	Jul–Jan	Middle
18	Pied Bushchat	*Saxicola caprata*	Resident	Monsoon	Jun–Sep	Early
19	Indian Robin	*Saxicoloides fulicatus*	Resident	Monsoon	Jun–Sep	Early
20	Oriental Magpie Robin	*Copsychus saularis*	Resident	Monsoon–Winter	Jul–Dec	Early
21	Siberian Rubythroat	*Calliope calliope*	Winter Migratory	Winter	Nov–Feb	Early
22	Black-hooded Oriole	*Oriolus xanthornus*	Resident	Monsoon	Jun–Sep	Middle
23	Golden Oriole	*Oriolus oriolus*	Migratory	Summer–Monsoon	Apr–Sep	Middle
24	Eurasian Wryneck	*Jynx torquilla*	Winter Migratory	Winter	Nov–Feb	Early
25	Coppersmith Barbet	*Psilopogon haemacephalus*	Resident	Monsoon	Jun–Sep	Early
26	Brown-headed Barbet	*Psilopogon zeylanicus*	Resident	Monsoon	Jun–Sep	Early
27	Red-vented Bulbul	*Pycnonotus cafer*	Resident	All seasons	Jul–Feb	Early
28	Red-whiskered Bulbul	*Pycnonotus jocosus*	Resident	Monsoon	Jun–Sep	Early
29	Jungle Babbler	*Argya striata*	Resident	Monsoon	Jun–Sep	Early
30	Large Grey Babbler	*Argya malcolmi*	Resident	Monsoon	Jun–Sep	Early
31	Common Tailorbird	*Orthotomus sutorius*	Resident	Monsoon	Jun–Sep	Early
32	Ashy Prinia	*Prinia socialis*	Resident	Monsoon	Jun–Sep	Early
33	Plain Prinia	*Prinia inornata*	Resident	Monsoon	Jun–Sep	Early
34	Grey Wagtail	*Motacilla cinerea*	Winter Migratory	Winter	Nov–Feb	Early
35	White Wagtail	*Motacilla alba*	Winter Migratory	Winter	Nov–Feb	Early
36	Paddyfield Pipit	*Anthus rufulus*	Resident	Monsoon	Jun–Sep	Early
37	Shikra	*Accipiter badius*	Resident	Winter	Nov–Feb	Late
38	Black Kite	*Milvus migrans*	Resident	Winter	Nov–Feb	Late
39	Barn Owl	*Tyto alba*	Resident	Winter	Nov–Feb	Late
40	Spotted Owlet	*Athene brama*	Resident	Winter	Nov–Feb	Late
41	Jacobin Cuckoo	*Clamator jacobinus*	Monsoon Migratory	Monsoon	Jun–Sep	Early
42	Himalayan Rubythroat	*Calliope pectoralis*	Winter Migratory	Winter	Nov–Feb	Early
43	Indian Pitta	*Pitta brachyura*	Monsoon Migratory	Monsoon	May–Sep	Early–Middle
44	White-rumped Shama	*Copsychus malabaricus*	Resident	Monsoon–Winter	Jun–Jan	Early

FIG:- Birds effect Tasar Rearing Field in West Bengal (Bankura, Purulia, Birbhum)

Results

A) Avian Pest Diversity

Field observations and farmer reports indicated that several bird species feed on tasar silkworm larvae in the study area. Both resident and migratory birds were recorded in tasar plantations. Larger omnivorous birds such as crows and treepies were reported to attack

middle and late instar larvae, while smaller insectivorous birds occasionally feed on early instar larvae.

Winter season migratory birds were also observed in tasar rearing fields. Although not all migratory birds directly feed on silkworm larvae, their presence increases the diversity of potential avian predators.

B) Questionnaire Survey Results

The questionnaire survey involved **120 farmers** from four districts. The results indicate that bird predation is a common issue affecting tasar rearing fields. Most farmers reported that bird attacks occur frequently during winter season when migratory birds arrive in the region.

Farmers also observed that **middle and late instar larvae are more vulnerable to bird predation**, likely due to their larger size and greater visibility. Bird attacks were reported mainly during **morning and late afternoon hours**, when birds actively forage for insects.

Traditional control methods such as scarecrows, reflective ribbons and continuous monitoring of plantations were commonly used by farmers. However, only a small number of farmers reported using protective nets or modern deterrent techniques.

Table 3 Questionnaire Survey Results (30 Farmers per District)

Question	Birbhum	Bankura	Purulia	Jhargram
Birds attack tasar silkworm larvae	Yes 24 / No 3 / Not sure 3	Yes 26 / No 2 / Not sure 2	Yes 23 / No 4 / Not sure 3	Yes 22 / No 5 / Not sure 3
Bird attack higher in winter	Yes 25 / No 2 / Not sure 3	Yes 27 / No 1 / Not sure 2	Yes 24 / No 3 / Not sure 3	Yes 23 / No 4 / Not sure 3
Early instar larvae attacked	Yes 15 / No 10 / Not sure 5	Yes 16 / No 9 / Not sure 5	Yes 14 / No 11 / Not sure 5	Yes 13 / No 12 / Not sure 5
Middle or late instar more affected	Yes 22 / No 5 / Not sure 3	Yes 24 / No 4 / Not sure 2	Yes 21 / No 6 / Not sure 3	Yes 20 / No 7 / Not sure 3
Migratory birds observed	Yes 20 / No 4 / Not sure 6	Yes 22 / No 3 / Not sure 5	Yes 19 / No 5 / Not sure 6	Yes 18 / No 6 / Not sure 6
Bird predation causes crop loss	Yes 21 / No 4 / Not sure 5	Yes 23 / No 3 / Not sure 4	Yes 20 / No 5 / Not sure 5	Yes 19 / No 6 / Not sure 5
Bird attack mostly morning	Yes 18 / No 6 / Not sure 6	Yes 20 / No 5 / Not sure 5	Yes 17 / No 7 / Not sure 6	Yes 16 / No 8 / Not sure 6
Farmers use traditional deterrents	Yes 19 / No 6 / Not sure 5	Yes 21 / No 5 / Not sure 4	Yes 18 / No 7 / Not sure 5	Yes 17 / No 8 / Not sure 5
Farmers use nets or barriers	Yes 8 / No 18 / Not sure 4	Yes 9 / No 17 / Not sure 4	Yes 7 / No 19 / Not sure 4	Yes 6 / No 20 / Not sure 4
Bird attack depends on location	Yes 22 / No 4 / Not sure 4	Yes 23 / No 3 / Not sure 4	Yes 21 / No 5 / Not sure 4	Yes 20 / No 6 / Not sure 4

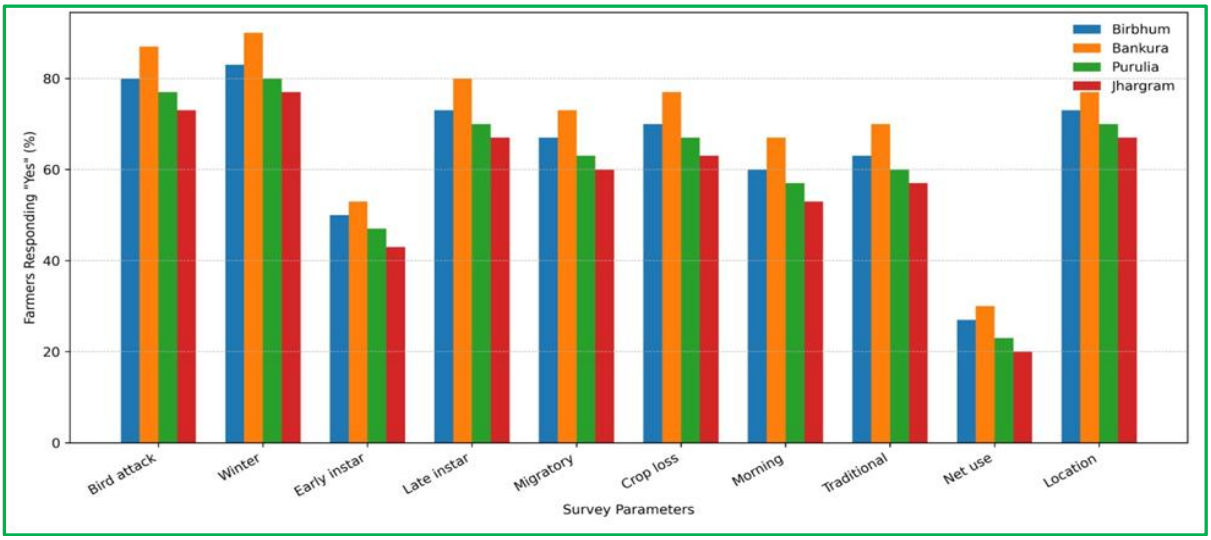

Figure 1: District-wise farmer responses on bird predation in tasar silkworm rearing (% Yes responses).

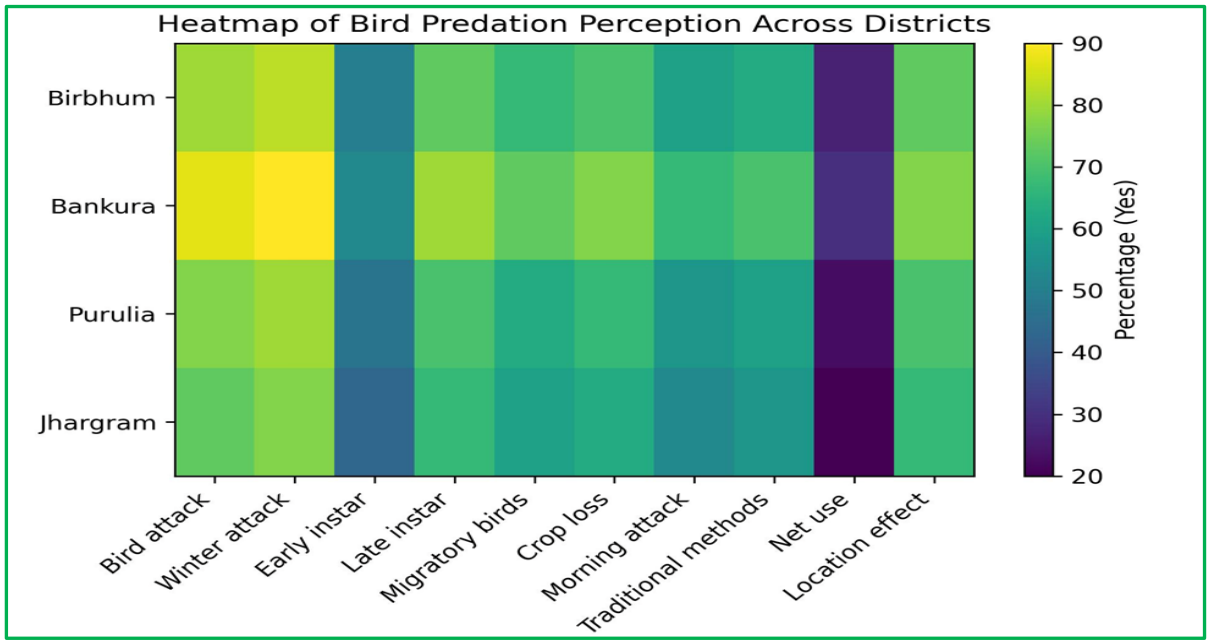

Figure 2: Heatmap showing perception intensity of bird predation across districts.

Discussion

The results indicate that avian predators are an important factor affecting tasar silkworm survival in the studied districts. Bird predation was reported by the majority of farmers, indicating that this problem is widespread in tasar rearing ecosystems. The presence of migratory birds during winter months may contribute to increased predator diversity. However, resident bird species such as crows and treepies appear to be the most significant predators of silkworm larvae.Traditional bird deterrent methods remain the primary control strategy used by farmers. These techniques are inexpensive and easy to implement but may not always provide complete protection.

Conclusion

Bird predation is a major challenge in tasar sericulture in the districts of Birbhum, Bankura, Purulia and Jhargram. Both resident and migratory bird species were found to prey on silkworm larvae, particularly during middle and late instar stages.The questionnaire survey revealed that most farmers rely on traditional methods to reduce bird attacks, while modern protective measures are rarely used. Improving farmer awareness and introducing improved predator management strategies could help reduce crop loss and enhance tasar cocoon production.

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