

RELATIVE IMPACT OF SPECIES DIVERSITIES ON THE EGG BEHAVIOUR OF FOUR DIFFERENT TYPES OF TASAR PRODUCING INSECTS UNDER DIFFERENT CONDITIONS

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The different species of *Antheraea* belonging to the family Saturniidae of order Lepidoptera are famous for the production of silk yarn. In the present investigation, the egg laying performance of four different species of *Antheraea* under different natural and artificial conditions were observed. It was found that *Antheraea mylitta* and *Antheraea proylei* showed better performance in all the conditions as compared to other two species namely *Antheraea pernyi* and *Antheraea roylei*.

INTRODUCTION

The silk is the most beautiful gift of nature produced by sericigenous insects. The Tasar silk which is very much popular these days, is derived from different species of *Antheraea*. The common species of the genus *Antheraea* are *A. mylitta*, *A. proylei*, *A. pernyi* and *A. roylei*. These species belong to the family saturniidae of order Lepidoptera. All the four species show diversities in their behaviour. The workers related to Tasar culture include Akai (1998), Basker (2006), Dutta *et al.* (2007), Chaudhury (2003) and Goel *et al.* (1993). These workers, though carried out work on Tasar culture, did not work out species diversities in their fullest dimensions. Therefore, in the present investigation, relative impact of species diversities on their egg laying behaviour under different conditions have been carried out in detail.

MATERIALS & METHODS

Materials for the present investigation include four species of *Antheraea*. For experiment, the cocoons of four different species namely *A. mylitta*, *A. proylei*, *A. pernyi* and *A. roylei* were collected from Ranchi Seed Supply Station and carefully transported to the place of research centre. The selected cocoons after assortment were put in ventilated cages separately in hanging position in the form of garlands to provide natural disposition. After the emergence of male and female moths from the stored stock, the four species of *Antheraea* were assorted carefully for the purpose of coupling. The male

and female moths were put in bigger bamboo baskets for pairing. For experimental purpose, when specific crosses were required, the desired moths were kept in monias of 6" x 6" x 4" size for 1-2 hrs. The male moths after coupling were rejected and female moths were allowed for egg laying. The female moths of different species of *Antheraea* were kept in paper box separately having muslin cloth base for egg laying at a temperature range of 26-28°C and 70-80% RH. The first and second batches of eggs were collected during the total period of 48 hrs.

RESULT AND DISCUSSION

The egg laying performance of four different species of *Antheraea* namely *A. mylitta*, *A. proylei*, *A. pernyi* and *A. roylei* in relation to different factors have been recorded in Table nos. 1 to 6.

The egg laying pattern during seed crop and commercial crop seasons for *Antheraea mylitta* (235 and 255) and *Antheraea proylei* (195 and 205) have shown relatively greater potentialities as compared to *Antheraea pernyi* (135 and 160) and *Antheraea roylei* (130 and 160) tasar moths. The tables further indicate that the rate and frequency of egg laying by all the four species of tasar insects are by and large greater during commercial crop season. Similarly the egg laying behaviour was also studied under different artificial conditions like paper made boxes, wooden boxes, plastic boxes and in glass jars. The observations have been given in Tables 3, 4, 5 and 6.

Table : 1

Table showing egg laying performance of four different tasar moths during seed crop season.

SN.	Different species of tasar insects	Av. No. of eggs laid			Total
		1st day	2nd day	3rd day	
1	<i>Antheraea mylitta</i>	123	82	30	235
2	<i>Antheraea proylei</i>	132	52	11	195
3	<i>Antheraea pernyi</i>	102	22	11	135
4	<i>Antheraea roylei</i>	80	40	10	130

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Table : 2

Table showing egg laying performance of four different tasar moths during commercial crop season.

SN.	Different species of tasar insects	Av. No. of eggs laid			Total
		1st day	2nd day	3rd day	
1	<i>Antheraea mylitta</i>	132	87	36	255
2	<i>Antheraea proylei</i>	137	52	16	205
3	<i>Antheraea pernyi</i>	100	45	15	160
4	<i>Antheraea roylei</i>	110	30	15	155

Table : 3

Table showing relative egg laying performance of four different tasar insects in the paper made boxes.

SN.	Different species of tasar insects	Av. No. of eggs laid			Total
		1st day	2nd day	3rd day	
1	<i>Antheraea mylitta</i>	132	90	39	261
2	<i>Antheraea proylei</i>	140	53	19	212
3	<i>Antheraea pernyi</i>	121	36	19	176
4	<i>Antheraea roylei</i>	100	35	15	150

Table : 4

Table showing relative egg laying performance of four different tasar insects in the wooden boxes.

SN.	Different species of tasar insects	Av. No. of eggs laid			Total
		1st day	2nd day	3rd day	
1	<i>Antheraea mylitta</i>	100	70	30	200
2	<i>Antheraea proylei</i>	120	51	12	182
3	<i>Antheraea pernyi</i>	100	25	05	130
4	<i>Antheraea roylei</i>	80	30	10	120

Table : 5

Table showing relative egg laying performance of four different tasar insects in the plastic boxes.

SN.	Different species of tasar insects	Av. No. of eggs laid			Total
		1st day	2nd day	3rd day	
1	<i>Antheraea mylitta</i>	75	25	07	107
2	<i>Antheraea proylei</i>	70	25	09	104
3	<i>Antheraea pernyi</i>	70	30	10	100
4	<i>Antheraea roylei</i>	60	20	10	90

Table : 6

Table showing relative egg laying performance of four different tasar insects in the glass jars.

SN.	Different species of tasar insects	Av. No. of eggs laid			Total
		1st day	2nd day	3rd day	
1	<i>Antheraea mylitta</i>	60	12	08	80
2	<i>Antheraea proylei</i>	50	12	08	70
3	<i>Antheraea pernyi</i>	35	15	05	55
4	<i>Antheraea roylei</i>	30	10	05	45

The tables reveal the suitability of paper box and wooden boxes over plastic boxes and glass container. The tables further indicate that the egg laying among all the four species of tasar insects follow a decreasing trend from first day to third and final day. However, the relative differences in relation to species are highly significant. The four types of tasar insects have shown under given order for the egg laying in descending sequence.

A. mylitta > *A. proylei* > *A. pernyi* > *A. roylei*

Thus, all the four species of *Antheraea* differ among themselves in their egg laying performance. The egg laying performance of *Antheraea mylitta* followed by *Antheraea proylei* have been found relatively better as compared to *Antheraea pernyi* and *Antheraea roylei*. The better performances are perhaps due to the fact that *Antheraea mylitta* and *Antheraea proylei* are indigenous species of *Antheraea* and two other species are exotic which have acclimatised with the indigenous conditions and climates. The results obtained are in close conformity with the earlier works carried out by Arora *et al.* (1979), Das *et al.* (1979), Chaudhury (2003), Kumar (2010) and Mishra (2014).

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