Journal of Global Biosciences
ISSN 2320-1355
Volume 9, Number 6, 2020, pp. 7614-7617
Website: www.mutagens.co.in
URL: www.mutagens.co.in/jgb/vol.09/06/090615.pdf

Research Paper

CORRELATION AND REGRESSION STUDIES IN RELATION TO FEMALE PUPAL WEIGHT AND EGG LAYING IN TASAR SILKWORM, *Antheraea mylitta* D. (SATURNIIDAE: LEPIDOPTERA)

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Abstract

The present communication reveals that there exist a linear regression and positive correlation between female pupal weight (X) and the number of eggs laid by the female tasar moth (Y) of *Antheraea mylitta* D. The findings are indicative of the fact that female pupal weight is the index for the numbers of eggs laid by female moth of *A. mylitta* D. since these two factors are reciprocal to each other.

Key words: Pupal weight, Regression, Correlation, Egg laying.

INTRODUCTION

Antheraea mylitta D. belonging to family Saturniidae of order Lepidoptera is the principal indigenous tasar silk producing insect of great commercial importance. It is usually reared on various tasar host plants in the forest areas of tropical tasar producing zones of India (Jolly, 1979). Subramanian *et al.* (2012) observed significant impact of cocoon characters on the oviposition of eri silkworm *Samia cynthia.* Sharma *et al.* (1990) revealed that there exists a reciprocal relationship between the female pupal weight and pattern of egg laying among the ecotypes of *Antheraea mylitta* D. The significant impact of different environmental conditions of egg laying behaviour of *Samia cynthia* has been worked out by Jaiprakash *et al.* (2010). The perfect method for the calculation of fecundity number in silkworms is reported by Buhroo *et al.* (2017). The present communication is an attempt to examine a relationship between the weight of female pupa and number of eggs laid by the female moth of *A. mylitta* D.

MATERIALS AND METHODS

Healthy tasar cocoons of *A. mylitta* were collected from the rearing sites and kept under the normal laboratory conditions for a week for acclimatization. Further pupae were taken out from the cocoons and categorised in group A (15 to 17gm), group B (12 to 15gm) and group C (9 to 12gm) on the basis of pupal weight. The pupae of all the three groups were allowed for the emergence of moths separately under similar laboratory conditions.

Ten pairs of moths from each group were selected for coupling and thereafter the female moths of all the three were kept for egg laying for three days. The average numbers of eggs laid by all three groups were collected separately and examine for the relationship between pupal weight and number of eggs laid by female moths with the help of correlation and regression studies. In the course of experiment the entire grainage operations were carried out as per the methods suggested by Krishnaswamy *et al.* (1973).

RESULTS AND DISCUSSION

Results obtained clearly indicate that female pupal weight has significant and reciprocal relationship with the number of eggs laid by female moth of *Antheraea mylitta* D.

The regression analysis for each group and pooled data were computed as follows:

Group A	Y= 46.28	X= 461
Group B	Y= 108.60	X= 1213
Group C	Y= 68.49	X= 568
Pooled	Y= 28.50	X= 169.8

The co-efficient value for each group is recorded in table 1. It shows that their values comes to be 0.587 which is highly significant indicating that there is linear relationship between the pupal weight and number of eggs laid by the female tasar moth. However, chi square (χ^2) is non –significant indicating that the three groups of pupae have same origin.

Table 1: Analysis of correlation co-efficient (r) and Regression for the weight of pupa and number of eggs laid by female moth of *Antheraea mylitta* D.

Sl. No.	Group	N	R	Y	X
1	A	10	0.317	46.28	461
2	B	10	0.794	108.60	1213
3	C	10	0.548	68.49	568
Pooled				28.50	169.8

Average Correlation co efficient = 0.587*

*Significant at 1% level

In the above said table,

N implies No. of Moths from each group selected for coupling.

R implies correlation co-efficient for the weight of pupa and number of eggs laid by female moth of *Antheraea mylitta* D.

X implies female pupal weight of *Antheraea mylitta* D

Y implies the number of eggs laid by the female tasar moth *Antheraea mylitta* D

From above equation it is inferred that the relative difference in the number of eggs laid by three groups of female tasar moths is attributed to variation in weight of pupae. Thus the study suggests that the pupae weight of female pupae of *A. mylitta* creates index for the number of eggs laid by female tasar moths.

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