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STUDIES ON PROGRESSION GROWTH FACTOR FOR ERI SILKMOTH, *SAMIA RICINI* DONOVAN (LEPIDOPTERA: SATURNIIDAE)

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ABSTRACT

The Progression Growth Factor was studied for Eri silkmoth, *Samia ricini* Donovan by rearing the larvae on the leaves of four food plants (Castor, *Ricinus communis*; Kesseru, *Heteropanax fragrans*; Tapioca, *Manihot utilissima* and papaya, Carica *papaya*) at 26-28^{0}C temperature and 60-85% relative humidity.

It was observed that the values of Progression Growth Factor were almost at par for castor and kesseru leaves indicating that growth was similar on both of the host plants. The value was lesser for tapioca leaves than castor and kesseru. However, the larvae could not complete their life cycle on papaya leaves.

Key words: Eri silkmoth, larva, Progression Growth Factor, Castor, Kesseru, Tapioca and Papaya

INTRODUCTION

The study on growth has vast application in various fields of biology. Several workers have published data on growth measurements (Safer, 1923; Yagi, 1926; Hodge, 1933; Duarte, 1938; Devey, 1954; Misra, 1962; Sidhu and Misra, 1980). Growth has two aspects viz. the course of growth and the rate of growth. The course of growth is studied by cumulative or summation curves, which integrates all the successive magnitudes of gains added from time to time as the age advances, giving a continuous whole picture. This curve, however, can not tell about the fluctuations in the rate by which the gains are attained. The day to day gains in weight are revealed by the Rate of Growth, which plot the successive differences in gains, giving the curves of first differences (Brody, 1927; Thompson, 1942; Misra, 1962 and Joshi, 1981).

The Progression Growth Factor (PGF) is a part of course of growth and shows the multiple by which the weight of the larva has increased from one instar to the next. Thus, the study of Progression Growth Factor is very much helpful in the evaluation of different food plants. The present study was therefore, undertaken to evaluate various host plants of Eri silkmoth, *Samia ricini* Donovan.

MATERIAL AND METHODS

After microscopic examination of female moths for disease freeness, their eggs were utilized for this experiment. Immediately after hatching the larvae of Eri silkmoth, *S. ricini* were allowed to feed on tender leaves of Castor (*R. communis*); Kesseru (*Heteropanax fragrans*); Tapioca (*Manihot utilisima*) and Papaya (*Carica papaya*) to first and second instar larvae, more mature leaves to third instar larvae, while most mature leaves were fed to fourth and fifth instar larvae. As far as possible leaves of same thickness and growth were selected

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A Manual on Commercial Seed Production for Tropical Tasar is in press.

from the plants. This was done to ensure uniformity in the quality of the feed in all the replicates. If, however, the leaves from one plant were found insufficient, the leaves from another plant of equal growth and age were plucked and added to ensure feeding *ad libitum*.

The experiment was conducted at 26 - 28^{0}C temperature and 60-85% relative humidity.

There were three replications for each of the food plant having 100 larvae in each.

The experiment was repeated thrice and an average value was taken for the result.

RESULTS AND DISCUSSION

Table-1 shows that the growth in body weight of Eri silkworm, *S. ricini* has been progressing at a uniformly slow rate on all the three diets up to the beginning of the fourth instar when their weights increased in multiple of an average of 4.72 irrespective of the diet being *R. communis* or *H. fragrance* or *M. utilissima.* However, the Progression Growth Factor on Papaya diet is very less (2.85). It is interesting to note that during later stages, the larval weight increase had become exponential and well-marked. The Progression Factor on Castor (*R. communis*) and Kesseru (*H. fragrance*) diet is same, indicating that growth on castor fed larvae and on kesseru fed larvae is almost at par. The value of Progression Growth Factor is lesser (4.87) on tapioca fed larvae than on castor fed and kesseru fed larvae. In case of papaya the larvae could not complete their life cycle as mortality started from first instar and all the larvae died after third instar, indicating that papaya leaves may not be allowed to feed for successful rearing.

Looking into over all mean value of Progression Growth Factor of all the stages, the order of suitability of these host plants can be considered as follows:

R. communis> H. fragrance > M. utilissima > C. papaya

Table-1. Progression Growth Factor (Course of Growth) of the Eri silkmoth, *Samia ricini D.*, when the larvae were reared on four food plants

Instar / Stage	Castor		Kesseru		Tapioca		Papaya	
	Av.wt. # (in mg.)	PGF*	Av.wt. # (in mg.)	PGF*	Av.wt. # (in mg.)	PGF*	Av.wt. # (in mg.)	PGF*
I	1.53		1.55		1.54		1.54	
II	4.78	3.12	4.98	3.21	4.01	2.60	3.08	2.00
III	24.45	5.12	23.95	4.81	22.78	5.68	20.15	6.54
IV	148.53	6.07	147.25	6.15	131.50	5.77	survival:zero	0
	mean	**4.77**		**4.72**		**4.68**		**2.85**
V	690.90	4.65	685.5	4.66	589.00	4.48	survival:zero	0
At spinning stage	4911.00	7.11	4869.0	7.10	3428.00	5.82	survival:zero	0
	mean	**5.88**		**5.88**		**5.15**		
Mean of the whole		**5.21**		**5.18**		**4.87**		**2.85**

Average larval weight at beginning of each instar (in mg)

* Progression Growth Factor

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