



ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(9): 2361-2362
© 2022 TPI
www.thepharmajournal.com
Received: 01-06-2022
Accepted: 06-07-2022

Vaishali V Birari

M.Sc. Scholar, Department of Entomology, N. M. College of Agriculture, Navsari Agricultural University, Navsari, Gujarat, India

MR Siddhapara

Assistant Research Scientist, Department of Entomology, N. M. College of Agriculture, Navsari Agricultural University, Navsari, Gujarat, India

Role of silk gland and silk productivity of Eri silkworm

Vaishali V Birari and MR Siddhapara

Abstract

The studies on rearing performance of Eri silkworm, *Samia ricini* (Donovan) on different hosts viz., castor, tapioca, Arduso, banyan tree, Indian almond under laboratory condition during September 2018 to December 2018. The performance of Eri silkworm on different hosts revealed that the castor exhibited highest fifth instar larval weight (6.22 g), silk gland weight (0.50 g) and silk gland somatic index (8.08%) followed by tapioca and Arduso.

Keywords: Eri silkworm, silk gland, silk gland somatic index

Introduction

Sericulture is the art of science to rear silkworms for the production of silk. Sericulture creature- a key agro-based trade provides service at a different stage of rearing of silkworm i.e., host plant cultivation, silkworm rearing, reeling, spinning and weaving have much contact on the upgrading of rural prosperity. Silk is the queen of textiles industry spells luxury, elegance, class and comfort. Delicate qualities like the natural sheen, inherent affinities for dyes and vibrant colours, high absorbance, lightweight and flexibility (Ahmed *et al.* 2015) [1]. The growth and development of silk gland depends on the healthy silkworm and different hosts. Fully mature larva (just before the onset of spinning) was weighted and used for dissection to study the silk gland. The silk is secretion of a pair of large silk gland which counterpart to salivary gland of insect. The single silk gland was a long, tubular structure folded in a characteristic manner. The silk gland occupied almost the whole body of the mature larva which was largest organ of the body. Spinning apparatus with press and tube were present along with large secretary cells. The secretary cells secrete fibroin and sericin together.

Materials and Methods

The rearing of silkworm was conducted as per the technology suggested by Sarkar (1988) [7]. The rearing room along with rearing equipments were cleaned, washed with four per cent formalin. The seed stock of Eri silkworm was obtained from Central Muga Eri Research and Training Institute (CMERTI), Jorhat, Assam and maintained at Sericulture laboratory, Department of Entomology, N. M. College of Agriculture, Navsari Agricultural University, Navsari. The study on the role of silk gland in silk productivity of Eri silkworm on different hosts started with at least 25 neonate larvae of the same age per repetition and reared on different hosts viz., castor, tapioca, Arduso, banyan tree and Indian almond. Fully mature larva (just before the onset of spinning) weighted and used for dissection of silk gland in dissecting tray containing ice cold Bodenstern's ringer solution prepared with Tris buffer, PH 7. The dissecting silk gland was allowed for 5 to 7 minutes in buffer. Later it was transferred to thin and neat blotting paper to dry excess moisture from the silk gland. Different parameters were judged.

Results and Discussion

Fifth instar larval weight: The data on fifth instar larval weight presented in Table 1. The results found that significantly highest mature larval weight (6.22 g) observed on castor followed by tapioca (4.88 g), Arduso (4.54 g) and Indian almond (4.17 g). However, lowest larval weight (3.91 g) recorded on banyan tree. Reddy *et al.* (1989) [6] revealed that the weight of fifth instar larva was 6.40, 4.90 and 4.39 g on castor, tapioca and Arduso, respectively. Kumar and Gangwar (2010) [4] revealed that the weight of fifth instar larval was 7.45 and 6.82 g on castor and tapioca, respectively. Naik *et al.* (2010) [5] found that 4.55, 4.01 and 3.87g of fifth instar larval weight on castor, banyan tree and Indian almond, respectively. Chhatria *et al.* (2016) [2] revealed that mature larval weight of *P. ricini* was 7.02g on castor.

Corresponding Author:

Vaishali V Birari

M.Sc. Scholar, Department of Entomology, N. M. College of Agriculture, Navsari Agricultural University, Navsari, Gujarat, India

The present findings are more or less agreement with above workers.

Silk gland weight

The data on silk gland weight are presented in Table 1. The results revealed that the highest silk gland weight (0.50 g) recorded on castor followed by tapioca (0.37 g), Arduso (0.27 g) and Indian almond (0.19 g). While, it was lowest (0.13 g) on banyan tree. The present findings are more or less differing with Das (2015) [3] who reported that the weight of silk gland was 0.57 ± 0.03 g on tapioca. Chhatria *et al.* (2016) [2] revealed that silk gland weight of *P. ricini* was 1.49g on castor.

Silk gland somatic index

The data on silk gland somatic index are presented in Table 1. The results revealed that the silk gland somatic index found significantly highest (8.08%) on castor followed by tapioca (7.50%), Arduso (5.95%) and Indian almond (4.44%). Whereas, it observed lowest (3.33%) on banyan tree. The maximum silk gland ratio (23.80%) observed in larvae fed with castor followed by tapioca (21.51%).

Table 1: Silk gland and silk productivity of *S. ricini* on different hosts

Tr. No.	Hosts	Fifth instar larval weight (g)	Silk gland weight (g)	Silk gland somatic index (%)
T ₁	Castor	6.22 ^a	0.50 ^a	8.08 (16.52) ^a
T ₂	Tapioca	4.88 ^b	0.37 ^b	7.50 (15.89) ^b
T ₃	Arduso	4.54 ^c	0.27 ^c	5.95 (14.12) ^c
T ₄	Banyan Tree	3.91 ^e	0.13 ^e	3.33 (10.50) ^e
T ₅	Indian almond	4.17 ^d	0.19 ^d	4.44 (12.16) ^d
	S.Em.±	0.06	0.004	0.14
	CD at 5%	0.18	0.01	0.44
	CV%	2.52	2.63	2.09

* Figures in parenthesis are arcsine transformed values while outside are retransform values.

Treatment means with letters in common are significant by DNMRT at 5% level of significance

Conclusion

The performance of Eri silkworm on different hosts revealed that the castor exhibited highest fifth instar larval weight, silk gland weight and silk gland somatic index followed by tapioca and Arduso.

Acknowledgement

Authors are thankful to Director of Research and Dean, P.G. Studies, Navsari Agricultural University, Navsari for providing necessary facilities for research work. Also thankful to Central Muga Eri Research and Training Institute (CMERTI), Jorhat (Assam), India for providing Disease Free Layings of Eri silkworm for M.Sc. Study.

References

- Ahmed SA, Sarmah CR, Ahmed M, Shingh NI. Rearing performance and reproductive biology of Eri silkworm, *Samia ricini* (Donovan) feeding on *Alianthus* species and other promising food plants. *Advances in Biological Research*. 2015;9(1):07-14.
- Chhatria C, Rao TV, Sahoo S. Silk gland somatic index and tissue biochemical contents of UV-B irradiated Eri silkworm, *Philosamia ricini* (H.). *International Journal of Plant Animal and Environmental Sciences*. 2016;6(1):233-238.

- Das D. Rearing performance of Eri silkworm, (*Philosamia ricini* Hutt.) on tapioca (*Manihot utilisima*) during Autumn season in Assam. *Indian Journal of Applied Research*. 2015;5(6):527-528.
- Kumar R, Gangwar SK. Impact of varietal feeding of *Samia ricini* (Donovan) in spring and Autumn season of Uttar Pradesh. *ARNP Journal of Agricultural and Biological Science*. 2010;5(3):46-51.
- Naik CM, Patil GM, Murthy C, Awaknavar JS, Shekharappa, Alagundagi SC. Development and economic cocoon parameters of Eri silkworm, *Samia cynthia ricini* Boisduval (Lepidoptera: Saturniidae) as influenced by new hosts. *Karnataka Journal of Agricultural Science*. 2010;23(5):716-721.
- Reddy DNR, Kotikal YK, Vijayendra M. Development and silk yield of ERI silkworm *Samia cynthia ricini* (Lepidoptera: Saturniidae) as influenced by the food plants. *Mysore Journal of Agricultural Science*. 1989;23:506-508.
- Sarkar DC. *Eri culture in India*, central silk board, Government of India, Bangalore; 1980.