



EFFECT OF MATING DURATION ON FECUNDITY (REPRODUCTIVE PARAMETER) OF ERI SILK MOTH *PHILOSAMIA RICINI* IN DIFFERENT SEASONS

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ABSTRACT

Production of viable eggs in the Eri silkworm, *Philosamia ricini* is influenced by the mating activity. The effect of coupling duration on the fecundity of Eri silkworm, *Philosamia ricini* during different seasons was studied. Fecundity rate in Eri silkworm, *Philosamia Ricini* does not significant variation with increase in mating duration were observed different season.

Keywords:

Philosamia, Reproductive Parameter, Eri silkworm.

INTRODUCTION

Eri silk is produced by Eri Silkworm, *Philosamia ricini* (Lepidoptera: Saturniidae) has a unique distinction among other three silkworms of having its potential host, the castor (*Ricinus communis*) an important agricultural oil bearing crop. (Jolly *et al.*, 1979; Basaiah 1988; Pandey 1995; Reddy *et al.*, 1998; Debaraj *et al.*, 2000). Eri Silkworm pupae are nutritious. It does not annoying sound or odour and no drink water, less mortality rate than other silkworm.

In sericulture, it is established fact that several factors contribute in the growth and development of silkworm for the production of quality eggs. Quality silkworm seed refers to richness of layings, egg viability, hatching uniformity and more importantly good rearing performance of the progeny (Ullal and Narashimhanna, 1981) and it depends on management practices *i.e.*, rearing temperature, humidity, nutrition, and genotype of the breed. The better rearing conditions, environment and nutrition during larval period may leads to higher fecundity by silkworm moths (Miller, 2005; Malik and Reddy, 2007). Fecundity and fertility are the two main factors of seed cocoon production. Several factors affect the fecundity and fertility of silkworm races.

MATERIAL AND METHODS

One thousand healthy, freshly emerged moths of both sexes were selected at random in equal proportions during each rearing season. The moths were allowed to mate. A total of 400 moths were randomly selected from them and divided into 07 groups, with 15 couplings each. The moths in different groups were allowed to mate in separate cages for durations ranging from 1 to 5 hours, after which the moths were decoupled physically.

Treatment details:-

G1 – Mating duration – 1 hour (9.00 am.–10.00 am.)

G2 – Mating duration – 1:30 hrs (9:00 am –10:30 am.)

- G3 – Mating duration – 2 hrs (9:00 am.–11.00 am.)
 G4 – Mating duration – 2:30 hrs (9:00 am.–11:30 am.)
 G5 – Mating duration – 3 hrs (9:00 am –12:00 pm.)(Control)
 G6 – Mating duration – 4 hrs (9:00 am –1:00 pm.)
 G7 – Mating duration – 5 hrs (9:00 am –2:00 pm.)

Eggs laid by the mated females were collected, counted and kept under laboratory conditions until Fecundity. The Fecundity percentage was recorded and analyzed statistically (ANOVA).

Table 1: Mean values of percent Fecundity \pm Standard deviation of *Philosamia ricini* at different mating durations in different Season.

Duration of mating (hrs.)	Season-wise Fecundity percentage		
	Rainy Season	Autumn Season	Winter Season
G ₁	196.3 \pm 8.4	202.8 \pm 8.4	207.8 \pm 7.9
G ₂	193.6 \pm 6.8	203.6 \pm 8.1	205.7 \pm 6.4
G ₃	195.8 \pm 7.3	204.2 \pm 7.8	208.3 \pm 8.3
G ₄	195.8 \pm 8.9	203.7 \pm 8.8	207.4 \pm 7.6
Control G ₅	195.1 \pm 8.5	204.8 \pm 8.9	210.6 \pm 6.9
G ₆	194.4 \pm 8.1	201.1 \pm 8.8	206.2 \pm 7.5
G ₇	197.5 \pm 8.5	203.9 \pm 8.9	208.9 \pm 7.8

RESULTS

The present study was undertaken to know the impact of different mating duration on the reproductive performance in Eri silkworm, *Philosamia ricini*. Fecundity rate in Eri silkworm, *Philosamia. Ricini* does not significant variation with increase in mating duration were observed different season.

DISCUSSION

Narayanan et al. (1964) have reported that in the mulberry silk moth (*Bombyx mori.*) 1 to 2 h of mating is enough for normal oviposition. Jolly *et al.* (1974) observed that 1-2 hours of copulation are sufficient for normal hatchability of *A. mylitta* eggs. Gillot and Friedel (1977) have suggested that the egg production depends on the secretion of fecundity-enhancing substances by male insects at the time of mating. Behura and Panda (1978) have further observed that 4 hours of copulation were sufficient for normal oviposition in the Eri silk moth, *Samia ricini Hutt.* Shahi *et al.* (1979) reported an increase in the oviposition rate of *Dysdercus koenigii* Fabr. (Hemiptera: Pyrrhocoridae) with increase in mating duration. Torres-Vila *et al.* (2002) observed in *Lobesia botrana* that delayed mating did not affect female mating success but fertilization was reduced, but more number of day's delays of mating substantially affected daily oviposition pattern and resulted in a significant reduction of both fecundity and fertility. Mating frequency and duration have an important impact on reproductive fitness in insects. Wang et al. (2005) in their study in diamondback moth (DBM), *Plutella xylostella* (Lep., Plutellidae) reported, males could mate for five times with virgin females during scotophase, but the copulation rates, fecundity of female, and longevity of both females and males decreased when male mating times increased, whereas copulation duration increased. Knight (2007) in their study in *Cydia pomonella L.* observed

sequential mating by male moths had no effect on the fecundity of female moths or egg fertility; however, male moth age did impact on fertility. So decrease in fertility after 4th pairing might be due to aging effect of male as well as depletion of sperm.

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