

Performance of Eri silkworm *Samia cynthia ricini* Boisduval as influenced by eggs obtained from different days of oviposition

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ABSTRACT

Egg, larval growth and cocoon parameters were studied in eri silkworm *Samia cynthia ricini* Boisduval, as influenced by different days of oviposition. Fecundity (193.25 eggs), single egg weight (0.0019 g) and hatching (97.84%) were significantly highest in the first day laid eggs and least in the eggs laid on fifth day. Similar trend was observed for fifth instar larval weight (38.08 g/10 larvae) and effective rate of rearing (94.39%), but the larval duration was same (636 Hr.) among the batches of silkworms obtained from eggs laid on first three days. The cocoon, shell and pupal weights, moth emergence and fecundity showed favorable values in case of first day laid eggs. However, the shell ratio did not differ significantly, though the eggs laid on first two days showed marginally higher values.

Key words: Eri silkworm, Oviposition, Egg parameters, Growth, Cocoon.

INTRODUCTION

In *Samia cynthia ricini* Boisduval the egg laying starts one to two hours after mating and continues for three to four days (Jolly *et al.*, 1979). However, eggs laid on first two days are collected for rearing (Devaiah *et al.*, 1978; Sarkar, 1980). Similarly, in *Antheraea mylitta*, the moths lay eggs over a period of six to seven days, but only the eggs deposited in the first 72 hours are considered for rearing (Jolly *et al.*, 1979). The rearing performance of the silkworms obtained from eggs laid on different days has been investigated to certain extent (Vijayaraghavan *et al.*, 1983). In the present study an attempt has been made to know the rearing performance of eri silkworms obtained from eggs laid on different days of oviposition.

MATERIALS AND METHODS

The eggs were collected from twenty copulated moths for five successive days separately and split into four replications (eggs obtained from five moths constituted a replication, which was again averaged to per moth). Rearing was conducted on castor during August – September 2001, following standard rearing practices (Sarkar, 1980). Observations on fecundity at different days of oviposition, single egg weight, hatchability, weight of ten fifth instar larvae, larval duration, effective rearing rate (ERR), single cocoon weight, shell weight, pupal weight, shell ratio, moth emergence and fecundity were recorded and statistically analyzed (Sunderraj *et al.*, 1972).

RESULTS AND DISCUSSION

Among the egg parameters recorded, significantly highest fecundity (193.25) was observed on the first day of oviposition (Table 1 and figure 1), which dropped to 72.50 on second day of oviposition and was least (14.50) on fifth day. Similar observations are made in tropical tasar silkworms which lay 70 to 75 per cent of the eggs on the first day of oviposition (Mohanty, 1998). Single egg weight showed similar trend being significantly highest (0.0019 g) on first day and least (0.0011 g) on fifth day. Hatching percentage was also significantly highest among the eggs laid on first day and it showed gradual decrease with the advancement in the days of oviposition (97.84 to 60.14%). Earlier studies have suggested that eri eggs laid up to 48 hours resulted in better hatchability (Jolly *et al.*, 1979; Sarkar, 1980; Vijayaraghavan *et al.*, 1983). In the present study hatchability of more than 90 per cent could be obtained in the eggs laid on first three days.

The fifth instar larval weight was significantly highest (38.08 g/10 larvae) among the batches obtained from first day laid eggs and was least among the batches obtained from fourth day (28.89 g/10 larvae) and fifth day (28.41 g/10 larvae) laid eggs. The larval period was significantly minimum (636 hours) in the batches of silkworms obtained from the eggs laid on first three days. However, it was highest (756 hours) among the batch obtained from the eggs laid on fifth day (Table 1). Similarly, the ERR was maximum (94.39%) in case of worms obtained from first day of oviposition and it gradually declined reaching a minimum of 78.36 per cent in case of larvae

Table 1 : Egg and growth parameters of eri silkworm as influenced by different days of oviposition.

Days of oviposition	Fecundity (No.)	Single egg weight (g)	Hatchability (%)	Fifth instar larval weight (g/10 larvae)	Larval duration (hrs.)	ERR (%)
First day	193.25	0.0019 ^a	97.84 ^a	38.08 ^a	636 ^a	94.39 ^a
Second day	72.50	0.0017 ^a	93.66 ^{ab}	37.44 ^a	636 ^a	92.37 ^a
Third day	45.50	0.0012 ^b	91.76 ^{abc}	32.18	636 ^a	86.13
Fourth day	20.25 ^a	0.0010 ^b	81.99 ^{bc}	28.89 ^b	720	81.01 ^b
Fifth day	14.50 ^a	0.0011 ^b	60.14	28.14 ^b	756	78.36 ^b
F- test	*	*	*	*	*	*
S.Em.(±)	7.0630	0.0010	4.5940	0.9492	3.8987	1.3050
C.D. at 5%	21.7650	0.0002	14.1566	2.9250	12.0141	4.0215

* : Significant at 5%; Figures with same superscript are on par.

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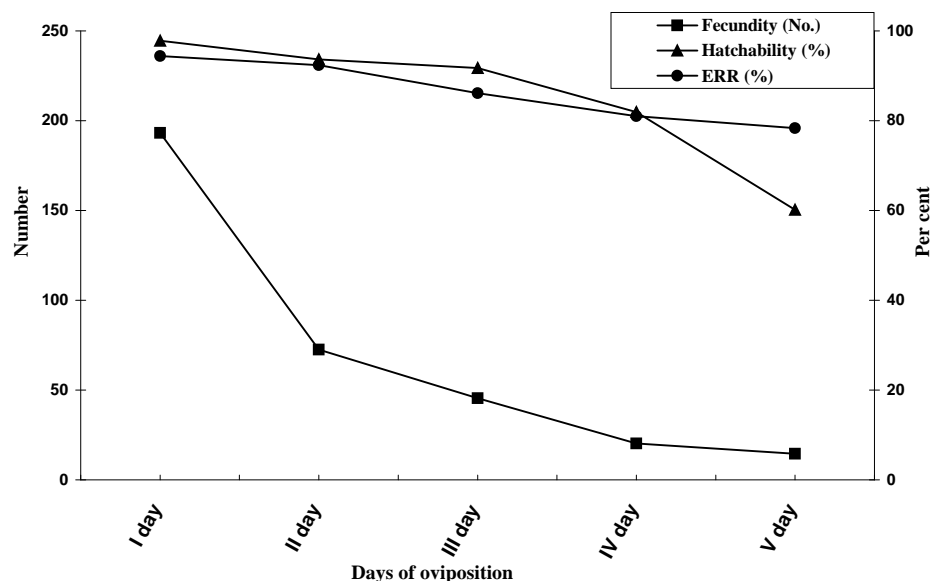


Fig. 1 : Influence of days of oviposition on fecundity, hatchability and ERR in eri silkworm.

obtained from the eggs laid on fifth day of oviposition.

The cocoon, shell and pupal weights showed significantly highest values when the first day laid eggs were utilized for rearing and declined as the days of oviposition advanced (Table 2). Though the shell ratio followed the same trend, it did not differ significantly

day, but the eggs laid up to third day are collected to avoid wide disparity during rearing. It can therefore, be concluded that eggs collected batch wise from first to third day can be utilized for economical rearing, since they contribute nearly 90 per cent of the total eggs laid by eri silk moths.

Table 2 : Cocoon and grainage parameters of eri silkworm as influenced by different days of oviposition.

Days of oviposition	Single cocoon weight (g)	Shell weight (g)	Pupal weight (g)	Cocoon shell ratio (%)	Moth emergence (%)	Fecundity (No.)
First day	2.7702 ^a	0.3855 ^a	2.3740 ^a	13.92	92.45 ^a	317.25 ^a
Second day	2.7365 ^a	0.3638 ^a	2.3452 ^a	13.29	91.42 ^a	303.75 ^{ab}
Third day	2.3297 ^b	0.2962 ^b	2.0195 ^b	12.72	89.30 ^b	298.00 ^{abc}
Fourth day	2.1510 ^b	0.2780 ^b	1.8610 ^{bc}	12.94	88.63 ^{bc}	285.00 ^{bc}
Fifth day	2.1310 ^b	0.2707 ^b	1.8390 ^c	12.66	87.14 ^c	290.00 ^c
F- test	*	*	*	NS	*	*
S.Em.(±)	0.0659	0.00123	0.0575	--	0.4823	6.2522
C.D. at 5%	0.2030	0.0380	0.1771	--	1.4863	19.2665

: Significant at 5%; NS: non significant; Figures with same superscript are on par.

among the batches of silkworms obtained from eggs laid on different days. These results are in agreement with the earlier findings (Anonymous, 1981). The rate of moth emergence differed significantly among the batches of silkworms obtained from different days of egg laying, highest being in first day laid eggs (92.45%) and least in fifth day laid eggs (87.14%). The fecundity of the moths obtained from first to third day laid eggs were statistically on par, though it showed marginal decline with advancement in days of oviposition. But, it was significantly least among the moths obtained from fourth and fifth day laid eggs. However, the information regarding the influence of days of oviposition on moth emergence and fecundity is wanting.

From the present findings it is obvious that the eggs laid on first day are superior with respect to almost all the parameters studied. However, the eggs laid on second and third day did show similar performance except for the fecundity. Mohanty (1998) has reported that egg laying in tropical tasar continues up to seventh

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Received : September, 2005; Accepted : March, 2005