SEASONAL VARIATION IN THE COMMERCIAL AND ECONOMIC CHARACTERS OF ERI SILKWORM, *SAMIA RICINI* (DONOVAN)

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ABSTRACT: Eri culture is mostly confined to the Brahmaputra valley of Assam and in few districts of the neighbouring states mainly Meghalaya, Nagaland, Manipur and Arunachal Pradesh. Eri culture is also spreading in different non-traditional states like, Andhra Pradesh, Tamil Nadu, Karnataka, Gujarat, Jharkhand, Chhattishgarh *etc.* The eri silkworm, *Samia ricini* (Donovan) is multivoltine and polyphagous in nature feeding on a number of food plants namely castor, *Ricinus communis*, Kesseru, *Heteropanax fragrans*, Tapioca, *Manihot utilissima*, Payam, *Evodia flaxinifolia* and Barpat, *Ailanthus grandis* and several others. Eri silkworm is reared indoor conditions for production of cocoons. Though eri silkworm can be reared throughout the year still there is a variation in some commercial characters in different seasons. To observe its seasonal variations in commercial characters a study was undertaken using a promising eri silkworm, Borduar eco-race feeding with castor. The highest larval weight (7.32 g), average fecundity (580 Nos.) and ERR (94.7%) was recorded during October-November. The highest single cocoon weight (4.01 g) was observed during August-September. Hence, it has been illustrated that autumn is the best season for eri silkworm rearing to improve productivity of eri silk.

KEY WORDS: Eri silkworm, season, cocoon character.

The eri silkworm is multivoltine in nature and 5-6 rearing can be reared throughout the year. But there is any definite season for eri rearing. Depending upon availability of seed and leaf the rearing is conducted throughout the year. In sericulture industry rearing is the most important and critical phase. Silkworm rearing depends upon the prevailing climatic conditions of the place of rearing, availability of essential facilities/ materials like food plants, rearing house, appliances, equipments, etc. Unlike other silkworms, Eri silkworm rearing is simple and does not require high skill. Eri silkworms are hardy and less susceptible to diseases. The crops are assured as compared to other sericulture like mulberry, muga and tasar. The biology of eri silkworm was studied by the earlier workers like Choudhury (1982) and Sarkar (1988). The Borduar eco-races showed positive characters in all economic characters thus it was exploited commercially. In the corresponding period attempts were made during 2003-2008 to explore eri silkworm germplsm resources of the NE region and thus 26 accessions were collected along with one wild race (Chakravorty et al., 2008). In this study also, superiority of the Borduar eco-race was further confirmed. But information on different commercial characters during different seasons of rearing with special reference to agro climatic condition of NE India has not been studied so far. Hence, an attempt was made with the aim to evaluate best season for eri rearing using Borduar ecoraces in terms of larval weight, effective rate of rearing, single cocoon weight, single shell weight and fecundity.

MATERIALS AND METHODS

The study was conducted in two consecutive years. The rearing technology developed by the Central Muga Eri Research & Training Institute, Lahdoigarh, Assam, India was followed in the experiment. A promising eco race of eri silkworm Borduar was utilized by studying its evaluating characters (Sarmah, 2000). Characters like fecundity, hatching percentage, larval weight, cocoon weight, shell weight and SR% was considered for evaluation programme. A non-bloomy red variety (NBR-1) of castor (*Ricinus communis*) was used as food plant for the study. The eri moth emerged from the cocoons of the Borduar eco-race was allowed for coupling and lay egg individually. After hatching of egg rearing was conducted keeping 100 worms per replication maintaining three replications in eight seasons to collect evaluating the characters. Similarly to study suitable season the eri moth emerged from the cocoons of the respective periods were allowed for coupling and lay egg individually. After hatching of egg rearing was conducted keeping 150 worms per replication maintaining four replications. The data related to larval weight, ERR (%), single cocoon weight, single shell weight and fecundity were recorded and analyzed following Duncan's Multiple Range Test (DMRT). Average maximum and minimum temperature and percentage of relative humidity data during different seasons were recorded.

RESULTS

Results showed the variation in the commercial characters of eri silkworm during different seasons/periods of rearing (Table 1).

Larval weight

The result indicated that the highest single larval weight was observed during October-November (7.32 g) followed by May –June (7.02 g) and August – September (6.66 g). But analysis of data showed that average weight of mature larva reared during October – November was not significantly different from the period of May- June whereas May- June data also not significantly different from the August – September.

Effective Rate of Rearing (ERR)

The highest ERR (%) was recoded during October-November (94.7%) whereas July-August, August-September and November-January showed insignificant variations (Table 1). The lowest ERR (%) was observed during April-May (74.0%).

Single cocoon weight

The highest single cocoon weight was recorded during August-September (4.01 g) followed by October-November (3.89 g) and July- August (3.85 g). Lowest was observed during April-May (3.23 g). The analysis of data showed that there was not significant variation in single cocoon weight during July- August, August-September and October- November (Table 1).

Single shell weight

In respect of single shell weight August –September and October-November showed similar weight of 0.53 g and 0.52 g respectively. The lowest single shell weight observed during November – January (0.45 g).

Fecundity

The highest average fecundity was recorded during October- November (580 nos.) and lowest during November- January (332 g).

DISCUSSION

The overall study revealed that Borduar eco-race showed distinct variation in commercial cocoon characters of eri silkworm in different season. Analysis of data showed that the performance of eri silkworm was found to be appreciably good particularly during autumn season (August-September and October-November) while compared with the performance in other seasons. Choudhuri (1982) also reported late spring and late autumn are the best season for commercial spinning of eri silkworm. Moreover, considering the performance of different grainage characters also such as good moth emergence, higher coupling realization, higher fecundity and higher hatchability of eggs the autumn season (September to November) was found to be the best for eri seed production (Sarkar et al., 2008).

CONCLUSION

The commercial rearing of eri silkworm is suggested during August-November season to have better cop harvests. The Borduar eco-race of eri silkworm may be explored for commercial seed as well as cocoon production for make the eri silk industry more economically vibrant and sustainable.

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Table 1. Seasonal variations in certain commercial characters of eri silkworm.

Sl. No.	Season/ period	Larval weight (g)	ERR (%)	Single co weight (g)	Single Shell weight (g)	Fecundity (no)	Av.temp. (c°)		Av.RH (%)
							Max	Min	
1	Apr-May	5.09 ^{e}	74.0^{d}	3.23^{d}	0.49^{ab}	400.25 ^{d}	31.41	25.41	75.14
2	May-Jun	7.02^{ab}	91.5^{b}	3.71 ^{b}	0.49^{ab}	467.00 ^{bc}	29.61	25.75	88.57
3	July-Aug	6.46 ^{c}	92.1^{ab}	3.55^{ab}	0.50 ^{ab}	472.75 ^{b}	29.89	26.43	89.0
4	Aug-Sep	6.66^{bc}	92.0 ^{b}	4.01 ^{a}	0.53 ^{a}	483.75 ^{bcd}	33.20	26.43	88.09
5	Oct-Nov	7.32^{a}	94.7^{a}	3.89^{ab}	0.53 ^{a}	580.0 ^{a}	27.80	22.70	87.98
6	Nov- Jan	5.98^{d}	92.1^{b}	3.66^{b}	0.45 ^{c}	332.0 ^{e}	21.50	13.56	79.66
7	Feb-Mar	5.92^{d}	87.9 ^{c}	3.62^{c}	0.47 ^{b}	412.5 ^{d}	26.50	18.90	70.04

Mean in a vertical column followed by same letter are not significantly different (p= 0.05, DMRT)

Figure 1. Eri silkworms feeding on Castor, *Ricinus communis* L.

Figure2. Seed production of eri silkworm.