

## Performance of C2 breed of eri silkworm, *Samia ricini* (Donovan) in different food plants

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### ABSTRACT

Eri-silkworm *Samia ricini* (Donovan) is multivoltine and polyphagous in nature feeding on a number of host plants. Performance of a high yielding eri silkworm breed C2 developed by Central silk Board, CMER&TI, Lahdoigarh was studied in different food plants viz., Castor, *Ricinus communis*, Kesseru, *Heteropanax fragrans* (Roxb.) Seem; Borpat, *Ailanthus grandis* Prain; Borkesseru, *Ailanthus excelsa* Roxb. Castor is the primary food plant of eri silkworm. Kesseru ranks second among all the food plant of eri silkworm and utilized as ruling perennial food plant. Other perennial two food plants viz., Borpat, *Ailanthus grandis* Prain; Borkesseru, *Ailanthus excelsa* Roxb are rarely used but potential eri food plants. During the study all food plants showed positive economic character in rearing performance.

**Keywords:** Eri silkworm, food plant, Rearing performance, C2 breed.

### INTRODUCTION

North East India is rich in Seri biodiversity being a natural abode for a number of sericigenous insects and their host plants. Eri silkworm, *Samia ricini* (Donovan) is considered as most popular commercially exploited Vanya silkworm now getting national as well as international limelight. Eri silkworms, being polyphagous in nature feed on number of food plants. The commercially exploited *S. ricini* is multivoltine and has several eco- races like, Nongpoh, Borduar, Titabar, Sille, Dhanubhanga, Mendipathar and Khanapara [8,4]. The eco-races were named based on the location of collection are maintained in the GPB. Very recently, Central Muga Eri Research Training Institute, Lahdoigarh, Jorhat, Assam has developed a high productive eri silkworm breed through hybridization programme named as C2 with higher shell weight and fecundity at its subordinate unit Regional Eri Research Station, Mendipathar [9]. Though castor is the main host plant of eri silkworm, castor leaf is not available throughout the year and the crop has to be sown every year. The castor is a warm season crop; the ideal season for plantation of castor is March to April and September to October in the northeast region of India. During winter season (long dry spell), its leaf yield gets considerably reduced. Moreover, its cultivation practices depend on rainfall conditions resulting in uncertainty in raising the castor crop and in turn ericulture. Further, several pests and diseases affect the castor crop and in controlling them large quantity of chemicals are used frequently. The chemical sprayed leaves are harmful to eri silkworm. In the event of uncertainty in rainfall and harsh climatic conditions tree based eri culture is the need of hour. In this direction, search for alternate perennial tree host plants available in the region for continuous eri silkworm rearing is essential. Therefore, a study was undertaken taking three perennial food plants viz., Kesseru, *Heteropanax fragrans* (Roxb.) Seem; Borpat, *Ailanthus grandis* Prain; Borkesseru, *Ailanthus excelsa* Roxb and performance were compared with Castor, *Ricinus communis* Linn. Kesseru is used as the best alternative perennial food plant for eri silkworm rearing. It is widely distributed in the North Eastern States of India, both in wild and cultivated condition. Taking the advantage of perennial in nature, Kesseru is being utilized in various developmental schemes on augmentation of eri food plants like Augmentation of Eri food plant (AEFP), Catalytic Development Programme (CDP) and Cluster Promotion Programme (CPP) etc. Besides, most of Government farms of Assam and Meghalaya planted kesseru for eri silkworm rearing. *Ailanthus* belongs to family Simaroubaceae is a perennial host plant for rearing of Eri Silkworm. There are four to five species are available in

India, which is distributed though out the country. Rearing parameter of C2 was studied during spring crop March-April, 2014 at Eri section of the institute located at Chenijan.

### MATERIALS AND METHODS

The experiment was conducted at the Muga and Eri Host plant Germplasm center of Central Muga Eri Research & Training Institute (CMER&TI) located at Chenijan, Jorhat, Assam. Eri silkworm rearing was done using new high yielding C2 breed. The performance of C2 breed observed during Hybrid Authorization programme is presented (Table-1). Three perennial food plants viz., Kesseru, *Heteropanax fragrans* (Roxb.)Seem; Borpat, *Ailanthus grandis* Prain; Borkesseru, *Ailanthus excelsa* Roxb was used as food plant maintained in germplasm bank of the institute. High yielding castor variety, Acc 003 [7] later named as NBR-2 was taken as control. Rearing was carried out maintaining 3 replications and 150 worms were kept per replication following standard Package of Practices [5,6]. Young instars worms were fed with castor and late instars worms during 4<sup>th</sup> and 5<sup>th</sup> stage fed with perennial food plants. The control was maintained by feeding with castor through out the rearing period. Rearing characters e.g., Larval wt. (g), Larval duration (days), Cocoon wt. (g), Shell wt.(g), Shell ratio (SR %) and Effective rate of rearing (ERR %) were recorded during the rearing period

### RESULTS AND DISCUSSION

Rearing performance of high yielding eri silkworm breed 'C2' has been studied on castor *Ricinus communis*, kesseru *Heteropanax fragrans*, Borkesseru *Ailanthus excelsa* and Borpat (*Ailanthus grandis*) (Fig 01) showing best performance in castor followed by kesseru (Table-2). It is already reported that castor is the primary food plant of eri silkworm and Kesseru is used as the best alternative food plant [2]. Further, leaf from perennial species can be best utilized for a successful rearing operation. It then becomes economic with a steady source of income to a family [1] To overcome the seasonality issue of the castor, Kesseru and *Ailanthus* may be the better option as a perennial host plant [1, 2]. In the study both *Ailanthus species* showed impressive performance in eri rearing except longer larval duration and little lower economic characters. Hence, both species of *Ailanthus* may play a pivotal role as alternative perennial host plant of eri silkworm for overall development of eri silkworm industry in addition to ruling kesseru food plant. The study period i.e., February-March, 2014 i.e., spring season is one of the best seasons for eri silkworm rearing in addition to autumn (September-October). The maximum temperature was recorded 28°C followed by minimum 17°C. The relative humidity was between 68-80%.

Table 1. Performance of Eri silkworm C2 breed

Sl. No.	Particulars	Norms fixed by Hybrid Authorization Committee of Central Silk Board	Local eco-races	C2 breed
1	Fecundity (No)	350	322	356
2	Hatching (%)	85	79.65	83.91
3	Cocoon yield by number/df	250	203	247
4	Cocoon yield by weight/df (kg)	0.750	0.590	0.900
5	ERR (%)	85	79.38	84.02
6	Single Cocoon weight (g)	3.0	2.89	3.67
7	Single Shell weight (g)	0.45	0.38	0.54
8	Cocoon shell ratio (%)	14.00	13.09	14.80

Table 2. Performance of eri silkworm C2 breed on different host plants during Feb-Mar, 14

Food plants	No. of dfls reared	Fecundity (No.)	Hatching (%)	Weight of mature larvae (g)	Larval duration (days)	Pupa-tion (%)	Cocoon yield / dfl (by No.)	Total cocoon harvested (No.)	ERR (%)	Single cocoon weight (g)	Single shell weight (g)	Shell ratio (%)
Kesseru, <i>H. fragrans</i>	20	355	85	8.45	22	92	235	4700	77.87	4.05	0.51	12.59
Borpat, <i>Ailanthus Grandis</i>	20	355	85	8.50	28	90	226	4520	74.89	4.06	0.56	13.79
Borkesseru, <i>Ailanthus excels</i>	20	355	85	8.50	28	90	220	4400	72.90	3.93	0.50	12.72
Castor, <i>Ricinus communis</i> (control)	20	355	85	9.50	20	95	265	5300	87.82	4.12	0.61	14.82
Mean	20.00	355.00	85.00	8.74	24.50	91.75	236.50	4730	78.37	4.04	0.55	13.48
St. Devn	0.00	0.00	0.00	0.51	4.12	2.36	19.97	399	6.62	0.08	0.05	1.04
Min.	20.00	355.00	85.00	8.45	20.00	90.00	220.00	4400	72.90	3.93	0.50	12.59
Max.	20.00	355.00	85.00	9.50	28.00	95.00	265.00	5300	87.82	4.12	0.61	14.82
C. Level (95.0%)	0.00	0.00	0.00	0.81	6.56	3.76	31.78	635.69	10.54	0.13	0.08	1.66

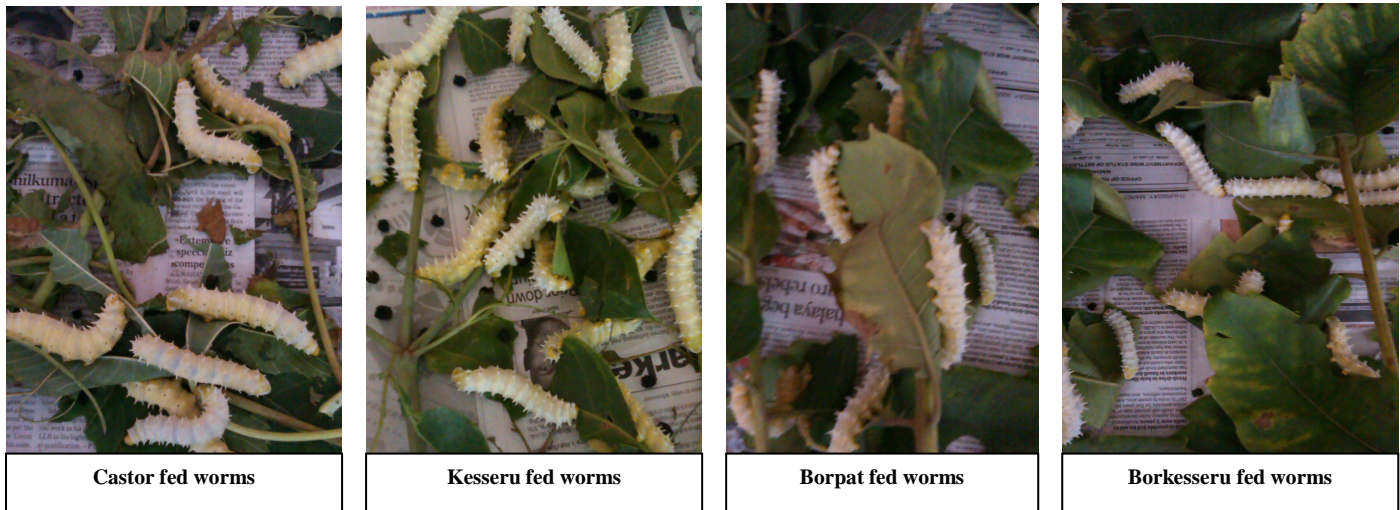


Fig. 1 Eri worms fed on different food plants

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