

RESEARCH ARTICLE

REARING PERFORMANCE OF ERI SILKWORM (Philosamia Ricini) FROM WARANA HILLY REGION AREA, KOLHAPUR, MAHARASHTRA

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Manuscript Info	Abstract
<i>Manuscript History</i> Received: 10 November 2022	An attempt was made to rear the eri silkworm, Philosamia ricini on the leaves of caster and reared under laboratory condition. It was observed
Final Accepted: 14 December 2022 Published: January 2023	that the caster is a primary potential host of eri silkworm. The growth parameters and cocoon characters of the eri silkworm reared on caster
<i>Key words:-</i> Eri Silkworm, Philosamia Ricini, Caster, Warana, Kolhapur, Maharashtra	leaves were normal. The eri silkworm successfully lasted its life cycle ranged from 38 to 40 days. The effective rate of rearing, weight of pre- spinning larvae, cocoon, shell and pupae ranged from 70 to 75 per cent,
	6 to 7 g, 3.01 to 3.05 g, 0.40 to 0.45g, 2.50 to 2.70g, respectively. Parameters such as length of cocoon shell, width of shell, shell thickness etc. The fecundity ranged from 400 to 425 eggs. Rearing
	future development of raw silk production.

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Introduction:-

The silk of the castor silkworm is produced by Philosamia ricini. Assam in India is the home of the eri silk industry (FAO, Manual, 1987). Sericulture being an important agro based industry provides employment at various levels i.e. host plant cultivation, silkworm rearing, reeling, spinning and weaving have much impact on the improvement of rural economy. Eri silkworm, P.ricini is a multivoltine sericigenous insect and largely reared by the farmers of North-eastern part of India, particularly in Assam (Sahu et al., 2006). The eri culture being carried out throughout the year in traditional areas because of the abundant availabity of castor plants in the rural areas (Rao et al., 2005; Siddique 2009).

The ambient temperature during rearing affects larval growth, survival rate, cocoon parameters and silk quality (Gumma, 1972). The quality of feed plays a remarkable role for growth and development of the silkworm and ultimately on the economic traits of cocoons (Hazarika et al., 2005). Recently different new food plant are discovered for eri silkworm and rearing performance under western maharashtra condition (Kavane, 2014). Based on the above cited literature and information the present study was conducted to suitable primary food for P.ricini. Therefore, an attempt has been made to rear the insect from 1st instar to 5th instar & allow for cocoon and adult formation.

Materials And Methods:-

The eggs of P.ricini were brought from private wild silkworm rearing and grainage research centre Atigre, Hatkanangle, Kolhapur. The eggs were incubated at room temperature $28 \pm 2^{\circ}$ C, $80 \pm 5\%$ RH and 10 hrs photoperiod. For this study the rearing methodology developed for wild silkworm was followed (Kavane, 2010, 2014).

Experiment was conducted from newly hatched larvae to adult formation. Sum of 100 worms were maintained in plastic boxes and G.I. tray are specially prepared for new technique to wild silkworm rearing. The host plants tender and soft leaves were fed one time a day up to 2nd instar and late age silkworms two times a day.

Cloth boxes specially prepared montages by the ripening larva. Cocoon harvesting was carried out after fifth day of spinning. The data was recorded for the study of biology, which includes larval duration, adult longevity and fecundity, effective rate of rearing (ERR), cocoon characters, colour, shape, single cocoon weight, shell weight etc. the above species of silkworm sufficient number of silkworm (100) were used for confirming results.

Results And Discussion:-

The biology of saturniid, P.ricini was studied under laboratory condition. The descriptions were made from live specimens reared during (June 2020– Nov.2022). It was observed that there was less mortality of I st instar worms when fed with tender, soft caster leaves.

The larvae of all the five instars fed upon tender, soft matured leaves and successfully complicated the life cycle. The result indicated that the rearing success of P.ricini on caster under indoor rearing conditions (28 ± 2 0C and RH of $80 \pm 5\%$ and 10 hrs photoperiod) was 90%.

The moths mated successfully, laid fertilized eggs in the mud pot and covered with nylon mesh in rearing house. On caster leaves, the incubation period, larval and pupal duration ranged from 10 days, 13 to 14 days, and 10 to 11 days respectively.

The P.ricini silkworm molted four times and there were five instars each lasted 2.25 2.75, 2.16, 2 and 4.5 days, respectively. The weight of matured tasar silkworm (v th instar) was 6 to 7g and measured 7.10 to 7.30 cm in length, 1.26 to 1.27 cm in circum. The weight of cocoon including pupa 3.02 to 3.10 g, the shell weights of cocoon 0.45 to 0.50 g and the shell lengths were 3.85 to 3.87 cm, the shell width of cocoon in indoor method were 1.20 to 1.22 cm , silk ratio 14.90 to 15.00% (Table.1).

The effective rate of rearing (ERR), adult longevity and fecundity ranged from 70 to75 per cent, 3 to 5 days and 400 to 425 eggs, respectively. The eggs hatchability was 97 to 100 percent and it was maximum on first day between 10 am. Further the life cycle of insect ranged from 38 to 40 days. The results of the study like performance of P.ricini silkworms in (Table. 2) and the fifth larval stage, different life stages are presented (Figs.1 & 3).

Newly hatched larvae were released on the leaves of the primary host plants caster with the help of soft camel hairbrush. 4 - 5 such leaves with mounted larvae were placed in the plastic box size 27 cm x 6 cm x 7 cm in length, width, and height respectively. The maximum portion of edge of each leaf was available to the larvae for feeding; the box was perforated with numerous exits for aeration and with covered lid to prevent escape of the larvae. Next day, the larvae were transferred to new box containing fresh leaf diet. The molting larvae transferred along with their support leaves. The old leaves were removed from the boxes at 12 hrs interval. Rearing of 1st and 2nd instars for used boxes were then washed, disinfected and dried for re-use.

Rearing trays of size (3'x 2.5'x 6') in length x width x height respectively) were used for rearing of 3rd, 4th and 5th instar larvae. A twig having 12 to 15 leaves was used as leaf diet 8 - 9 leaf twigs were introduced in the tray at a time. Larvae were transferred to a new trey along with help of new food. Touching with hand to food plants and silkworms was avoided mostly. The trays were cleaned after 24 hr interval. Molting larvae were transferred along with the left over parts of the food plant.

The full grown 5th instar larvae wandering for cocoon construction were sorted out and transferred to a box (4'X 2.5'in height X width) made up of hard card sheet provided them opportunity to form the cocoons (Kavane,2010,2014). The data was recorded for the study of biology, which includes larval duration, adult longevity and fecundity. Result shows table no .1 and table no.2

The effect of host plant species on the growth and development in the insects has been reported (Reddy et al., 1989). Impact of varietal feeding on samia ricini inspring and autumn season of Utter Pradesh studied (Rajesh Kumar and Gangwar, 2010).Hazarika et al. (2003) studies that castor was found best in terms of different parameters viz, larval wt, ERR, cocoon weight, shell weight etc. Performance of promising ecoraces of eri in agro climatic conditions of

western Odisha region studied (Ray et al., 2010).Rearing technology of eri silkworm under varied seasonal and host plant conditions in Tamilnadu reported (Subramanianan et al., 2013). Recently different new food plants are discovered for eri silkworm and rearing performance under western Maharashtra condition (Kavane, 2014). In the present study, some of the characters like hatching percentage, larval duration, larval weight, cocoon yield, single cocoon weight, shell weight, shell ratio, etc on caster food plant is used warana hilly region climatic condition.

Fecundity no/worm	Hatch%	Larval wt(g)	ERR%	Cocoon wt(g)	Shell wt(g)	S.R%	Larval period
100	100	6to7	95%	3.05	0.41	14.90	13to14

Table 1:- Cocoon characters of P.ricini eri silkworm on caster.

Table 2:- Rearing performance P.ricini eri silkworm on caster.

Life		Feedin	Leaf	Leaf	No of	No of	Box/tra	Duration	Humidit	Tem
stages	Duratio	g	numb	size	boxes/	trays	у	of	у	р.
	n	time	er on		cages		cleaning	sheding	%	0c
	feeding	per	food				time	Cuticle(hr		
	(hours)	day	plant					s)		
			twig							
Eggs	10days								80 - 85	28-
				-				-		30
1 st	30hrs	two	Tende	Whol	2		1	24 hrs	80 - 85	28-
instar			r	e						30
2^{nd}	46 hrs		Tende	Whol	4		1	20 hrs	80 - 85	28-
instar		Two	r	e						30
			/ June							
3 rd	28 hrs		June	Whol		2	2	20 hrs	80 - 85	28-
instar		Three		e						30
4^{th}	24 hrs		June	Whol		3	3	24 hrs	80 - 85	28-
instar		Four		e						30
5 th	11.8		June	Whol		4	4		80 - 85	28-
instar	hrs	Four		e						30
pupal	10days								80 - 85	28-
-	-									30
Adult	3-4								80 - 85	28-
longevit										30
у										



(ORIGINAL PHOTO GRAPH :- BYDR. KAVANE R P.)

Figure :- 1.Rearing tray with silkworm, 2&3.fully grown silkworm 4.fifth instar ,6. cleaning the silkworm , 7. cocoon on coconut leaves , 8. pupa ,9. moths

Acknowledgement:-

Author is thankful to Principal, Yashwantrao Chavan warana Mahavidyalaya, Warananagar, Kolhapur for providing Facilities

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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