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SUSTAINABLE ERI CULTURE AND IMPACT OF DIFFERENT FOOD PLANTS AND REARING TECHNOLOGY ON COCOON YIELD

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ABSTRACT

Eri culture is mostly confined to the Brahmaputra river valley of Assam and in the neighbouring state mainly Meghalaya, Nagaland, Manipur and Arunachal Pradesh and others nontraditional state. The conducive environment of the North East India has made the region a natural home of eri silkworm as well as their host plants. Eri silkworm is a multivoltine and hardy in nature and 4-5 crops can be reared in a year depending upon the availability of food plants. Eri silkworm, *Samia ricini* Donovan being polyphagous insect, has a wide range of food plants. There are 10 species of important different food plants of eri silkworm are available in north eastern region of India. Among these, Castor *Ricinus communis* Linn. and Kesseru *Heteropanax fragrans* Seem are primary and major food plants of eri silkworms. In sericulture industry, rearing of silkworm is the most important and critical phase and different methods of rearing technology was adopted by the eri Farmers. Silkworm rearing depends upon on food plants and the prevailing climatic conditions of a particular place. Improved rearing technology and well planned managerial skill are the pre-requisites for eri rearing to boost-up the cocoon production qualitatively as well as quantitatively. A comparative rearing with different major food plants *i.e.* Castor (*Ricinus communis,* Linn.), Kesseru (*Heteropanax fragrans*, Seem.), Tapioca (*Manihot esculenta,* Phol.) and Barkesseru (*Ailanthus excelsa,* Rox.) are conducted to find out the suitable food plants for commercial eri rearing. Among the different eri food plants, Castor (*Ricinus communis,* Linn) is one of the best and all time suitable for commercial rearing activities and cocoon harvest. Also, different type of rearing methods are applied by the eri farmers, *i.e.* Tray rearing, Bunch rearing and Platform rearing technology with different type of mountages *i.e.* Bamboo or Wooden stripe type collapsible mountage, Plastic collapsible mountages and Semi-dry leaves are use for spinning of eri silkworm. Among these rearing technology, Tray rearing is suitable for young age silkworm and Bunch rearing & Platform rearing technology are best rearing methods for late age eri rearing for productivity improvement. For the cocoon spinning of eri silkworm the Bamboo or Wooden stripe type collapsible mountage is best for cocoon spinning device for eri cocoon production. Details of the different eri food plants with various methods of eri rearing technology, different mounting devices and their impact on cocoon yield are described in this paper.

***Keywords*:** Sustainable Eri culture, Food plants, Rearing technology, Cocoon production.

Introduction

The beautiful eri silk moth under famous genus *Samia* Hubner, 19 species is recorded in the tropical Asia across the span of over 6,000 km. Eri silkworm *Samia ricini* Donovan is the only species among the vanya silkworm which has fully domesticated and commercially producing eri raw silk. Eri silkworm, *Samia ricini* Donovan being poly-phagous insect, has a wide range of food plants. There are 10 species of important different food plants of eri silkworm are available in north eastern region of India.

Table 1 : Different food plants of Eri silkworm

Sl. No.	Food plant species	Vernacular Name	Family	Distribution
01	*Ricinus communis*, Linn	Castor	Euphorbiaceous	India & others country
02	*Heteropanax fragrans*, Seem	Kesseru	Araliaceae	South east Asia
03	*Manihot esculenta*, Phol	Tapioca	Euphorbiaceae	South east Asia
04	*Evodia fraxinifolia*, Hook	Payam	Rutaceae	Nagaland & Eastern India
05	*Ailanthus grandis*, Rox	Barpat	Simaroubiaceae	N.E. and Eastern India
06	*Ailanthus excelsa*, Rox	Barkesseru	Simaroubiaceae	Northern & Eastern India
07	*Ailanthus integrifolia*	Barkesseru	Simaroubiaceae	Northern & Eastern India
08	*Ailanthus malabarica*	China-sumac	Simaroubiaceae	Western & Eastern India
09	*Ailanthus altissima*, Mille	Varnish tree	Simaroubiaceae	Throughout world
10	*Plumeria acutifolia*	Gulanch	Apocynaceae	Throughout world
11	*Carica papaya*	Amita	Euphorbiaceae	Throughout world
12	*Gmelina arborea*, Rox	Gamari	Verbenaceae	Throughout world
13	*Esterculia colorata*, Rox	Weljem	-	North Eastern India

Source: Chowdhury, 2000 and Peigler 2003

The important food plants of eri silkworm are mentioned herewith, which have been utilized for eri silkworm rearing in the north eastern region of India. Details of different food plants of eri silkworm, eri silkworm rearing activities and its impact on cocoon yield and economic characters are described below:

1. Castor (*Ricinus communis*) (Family: Euphorbiaceae)

Castor is the primary food plant of eri silkworm and intermediate plant usually annual and occasionally perennial in nature. Castor is a cross pollinated plant but unlike other cross pollinated plants it is inclined towards self pollination. In India castor is widely distributed in the north eastern States, West Bengal, Bihar, Rajasthan, Gujrat, Orissa, Andhra Pradesh *etc*. The north east States play a pivotal role in utilizing castor leaves for eri silkworm rearing and contribute major percentage of the total eri silk production of the country. There are several varieties of castor available in N.E. India. Among these NBR-1 is the first variety of castor showed best performance in leaf yield and silkworm rearing in N. E. India (Gogoi *et al*., 2006).

2. Kesseru: (*Heteropanax fragrans*) (Family: Araliaceae)

Kesseru (*Heteropanax fragrans*) is soft wooden tree and food plants of eri silkworm. Kesseru is considered as the second best food plant of eri silkworm after Castor. Kesseru leaves are hard and fibrous, hard in chewing the leaves as compared to castor. Kesseru is widely used as a best perennial food plant for eri silkworm rearing. It belongs to family Araliaceae is ranked second among all the food plants of eri silkworm next to Castor. It is widely distributed in the north eastern region of India, both in wild and cultivated conditions. However, cocoons harvested from the worms fed with Kesseru is compact. Hence, it takes more time for de-gumming during spinning as compared to castor fed ones. Feeding of Kesseru foliage during late instars rearing is more suitable. The cocoon become slightly smaller but compact than castor fed ones. Kesseru is the perennial evergreen tree and food plants have advantages to rear the eri silkworm throughout the year from the same plantation.

3. Tapioca:(*Manihot esculenta)* (Family:Euphorbiaceae)

Tapioca (*Manihot utilissima*) is tuber crop abundantly used for tribal people. The leaves are utilized rearing of eri silk worm when castor leaves become scare. It is tolerant to adverse climatic conditions. It is widely distributed in all the states of North East India. It is locally known as *Simalu alo* in Assam. More than 42 species are available in a wild state of this region. Tapioca is widely distributed in all the states of North East India and others state of India is used for dual purpose by the people 'tuber' as food and 'leaves' for eri silkworm rearing. The larvae of the eri silkworm reared on the Tapioca are smaller and cocoon weight, shell weight and fecundity also less.

4. Barkesseru (*Ailanthus excelsa,* Rox.)

Barkesseru are fast growing and drought resistant trees and deciduous in nature. The word "Ailanthus" is derived from the Moluccan Island of far eastern Indonesia simply means the "highest". The genus has 10 species, mostly native of China, India and south east Asia and Australia. Wild eri silkworm are frequently found in a natural condition feeding on Ailanthus leaves. Hence, they are often called Ailanthus silk moths. Barkesseru leaves can be also feed for eri rearing during late age rearing and cocoon can be harvest.

Material and Methods

Eri rearing on different host plant using different rearing technology with different mounting device in different four seasons *i.e.* Spring, Summer, Autumn and Winter were conducted to observed cocoon yield and economic characters. Improved package of practice for eri silkworm rearing technology developed by CMER&TI, Lahdoigarh (Suryanarayan *et. al.* 2004) were adopted to conduct the experiment. The details of rearing process, mounting of ripen eri worm and harvesting of cocoon are elaborated below:

Selection of races and season

High yielding eri silkworm Ecoraces *i.e.* Borduar were selected for eri rearing experiment. The four season seasons *i.e.* Spring, Summer, Autumn and Winter were considered for eri silkworm rearing in a year.

Disinfection and prophylactic measures

Complete and thorough disinfection of rearing house and appliances is vital for successful rearing. In fact, disinfection, before and after each rearing is considered the key for a successful cocoon crop. To protect from pathogens, special attention for disinfection of every nook and corner of the rearing house and appliances with proper chemicals in correct concentration is needed. Disinfection carried out on bright sunny days. The disinfection conducted with 5 % bleaching powder solution and Sprinkling of 2 % bleaching powder-lime mixture in the surroundings of the rearing house. All the crevices and holes of the room closed to prevent entry of pests, predators, pathogens *etc*. After completion of disinfection process the windows and ventilators kept open for proper aeration and free circulation of air.

Preparation of 5% bleaching powder solution and application

Adding of 500g bleaching powder in 10 liter of water and mixing the bleaching powder thoroughly with a rod and allow settling for some time. The solution is preferable to filter through a layer of thin cloth to avoid larger particle of lime in the solution. Washed the rearing appliances in the 5% bleaching powder solution. For the disinfection of rearing room floor with 5 % bleaching powder solution is used at the dose of one liter solution / 2.5 sq. meter area.

Eri dfls incubation and hatching

Incubation is a process in which the eggs are made to hatch under an ideal temperature, humidity, light, *etc*. The correctly followed incubation procedure ensured the rate of hatching and the health of the young worms and ultimately the cocoon quality. The disease free layings of eri silkworms were kept in the egg boxes for hatching after surface sterilization. Incubation of eggs at optimum conditions of temperature and humidity is essential for uniform embryonic development and good hatching. Eggs incubated in a well-maintained room at approx. 24-26^{o}C temperature and 75-80% relative humidity. The colour of the egg changes to a dark bluish before two days of hatching. This is the pigmentation stage and is very sensitive. In this stage the egg kept in total darkness /wrapped with black cloth or paper. It

indicates that the eggs are ready to hatch. Eggs exposed to light in the early morning hours at 5-6 am on the expected day of hatching to get uniform hatching simultaneously. Eggs generally hatch on 9-10th day in suitable seasons and 14-15th day in winter.

Hatching of worms

The eri larvae hatch out in the early morning hours and continue up to 9-10 a.m. On the first day of hatching tender castor leaves were provide on the larvae hatching tray after hatching of larvae. The newly hatch larvae crawl onto the leaf and start feeding. The leaves along with the larvae are transferred to the rearing tray with new fresh leaves. The worms hatch in the first two days (48 hours) show more healthy, good vigour and growth; and they are considered for stock maintenance of races. However, the brushing of three days (72 hours) worms is generally considered for commercial rearing. Preferably brushing completed during the early hours of the day. Eri rearing divided into two part *i.e.* A. Early stage and B. Late stage eri rearing. Generally early stage rearing is conduct in tray and the late stages eri rearing is 1. Bunch rearing, 2.Tray rearing and 3.Platform rearing are practices. The farmers of the north eastern region generally employ all the methods. The new recommendation of the R&D institutions is that the first three instars reared on trays and the fourth and fifth in stars on the bunch.

(a) Young age eri rearing technology

Eri silkworm feeds primarily Castor (*Ricinus communis* Linn.) and Kesseru (*Heteropanax fragrans seem*). The young age (I-III instars) silkworm rearing is conducted either in wooden or bamboo trays and best to feed in castor. The young age (I-III instars) silkworm rearing is conducted either in the wooden trays of 50 cm x 60 cm x 5 cm (L x B x W) size or in bamboo tray (of 70 cm dia.). 1st, 2nd and 3rd day hatching worm should be rear in separate tray during young age eri rearing for uniform moulting. Young age eri silkworm prefers **non-bloomy tender castor leaves**. Only tray rearing is recommended for young age eri rearing. Immediately after hatching of eri larvae in the early morning, tender castor leaves provided above the hatched worms. Newly hatch larvae crawl onto the leaf and start feeding. After completion of feeding of leaves, new leaves provided and cleaning of litter conducted time to time. Temperature is preferred 29-31ºC and relative humidity of 80-85% is most suitable for young age eri silkworm rearing. During young age eri rearing, extra care is required to prevent the delicate worms from pest and pathogen attack. Young age eri silkworm rearing is the basic criteria to increase the ERR (%) and successful crop harvest in Eri culture.

(b) Late age eri rearing technology

The late age eri rearing is important, in this stage fourth and fifth instars eri worm become voracious. There are several methods of eri silkworm rearing, *i.e.*,

1. Bunch-rearing technology
2. Tray-rearing technology
3. Platform rearing technology

The farmers of the north eastern region generally employ all the methods either singly or in combination together. Late age worms consist of fourth and fifth instars which need preferably lower temperature and humidity during rearing conditions. These stages consume more quantum of food than the young age worms because the worm has not only to develop silk glands and to increase growth rate, but also has to store up the reserve food materials for the future stages like pupa and moth. Therefore, these stages provided as much as quality food they require. The late age worms consume 80-85 % leaves supplied during the entire larval period. They attain significant growth during this stage. If the chawki rearing is conducted perfectly resulting healthy and robust worms with less mortality, the late age worm rearing will be easy with more chances of a successful crop. But proper care is essential to obtain the full potential of larval growth, maximum yield and best cocoon quality providing with sufficient food. The environmental and nutritional conditions required in late age rearing are different from that of young age worms. The ideal conditions of temperature ranged 24-26˚C and relative humidity ranged 70-80 % maintained during the rearing of late age worms. These stages provided with semi-matured leaves. The feeding of dried, yellow and diseased leaves deteriorates the health of the worms and even death due to diseases. Since 80-85 % of leaves are consumed by these stages, ensure continuous supply of quality leaves after preservation in the leaf chamber.

1. Bunch-rearing technology

In bunch rearing method, about 10-12 leaves of Castor, branches of Kesseru or 15 -20 leaves of Tapioca are tied together to make a bundle and hung vertically on a horizontal bamboo/wire/string support. Then the matured worms are allowed to feed on the tied leaves. The foliage is changed by keeping fresh bunch near the exhausted one and the worms crawl over the new one. Just below the hanging bunches, bamboo floar mat or tray was is kept on the floor so that the worms which fall down are not contaminated with dust on the floor and can be picked-up and put on the bunches. Bunch rearing is simple and easy with minimum cost but yields a better crop due to more hygienic condition. In this method, minimum manpower is utilized for bed cleaning, but strict maintenance is required like timely replacement of old bunches. Besides, there is no soiling of the leaves due to excreta of the worms as these are fallen down directly beneath the bunch and floor mat. Tier system bunch rearing is also may utilized for maximum worm rearing in per unit area.

2. Tray-rearing technology

In tray rearing method, the worms are reared providing the leaves on the tray. Trays are made up of either Bamboo or Wood in different shapes and sizes. The shapes are round (bamboo made) square and rectangular (wooden made). However, bamboo trays of size 1.0 m diameter is more convenient to rear 10-15 dfls until 2nd / 3rd instar; while 600-700 worms can be reared up to 4th instar and 300 worms in the fift instar which also provides sufficient space. Tray rearing technology have more capacity to hold the worms in time of rearing by using rearing stand of 6-7 tiers system with two tray per tier. In this technology, it is required more manpower to clean the tray every day and hence not cost effective.

3. Platform rearing technology

Platform rearing technology for eri silkworm consists of 3 nos. platforms each of made up of bamboo strips with

sieve size 1sq. cm. which are placed on a 3 tier bamboo rack of size L= 2.2m x B= 0.75m x H =1.60m. Two nos. of such racks can be placed in a room floor area 5.4 sq m. (1.2m x 4.5m). Maximum of 1200 eri silkworms at 5th instars can be reared in each platform to accommodate total 3600 silkworms by brushing 20-25 dlfs of eri silkworm. The technology is found to be advantageous to accommodate more quantity of silkworms per unit against the traditional Bamboo or Wooden tray (1m dia. with capacity of 300 nos. 5th instars worms) rearing system.

Maintenance of larvae

During the entire rearing period, the stage wise maintenance of food plants is provided considering the following aspects: Feeding and its frequency, bed cleaning, spacing of worms, precaution during rearing, care during moulting, handling of moulting worms and care, collection and destruction of weak, diseased and undernourished larvae.

Feeding and its frequency

The suitability of food plant leaves differs accordingly to the period of larval growth. After collection, preserved in the leaf preservation chamber covering with wet gunny cloth/bag all around and some of the leaves provide to worm. Castor leaves provide without petiole in tray rearing. At least 4-5 feedings has been given per day including in the night at regular intervals during the young age rearing. In late age worms due to increase feeding capacity, 5 feeding per day are essential. In the night time more than sufficient leaves provided to fulfill the required consumption throughout the night. It is advisable to prepare a routine feeding schedule and follow till the end of the rearing strictly.

Bed cleaning

As soon as the larvae grow-up, the unconsumed leaves and litter increase in the rearing bed which ultimately cause changing atmosphere and favour to multiplication of pathogenic organisms. Hence, timely bed cleaning is essential to keep the worms healthy. Frequent cleaning is better but it involves more man power and ultimately silkworm rearing uneconomical. Therefore, it is necessary to prepare stage wise cleaning schedule. Only one cleaning is sufficient during first stage worms. In 2nd and 3rd stage, 2-3 times bed cleaning has been carried. But in 5th stage, the consumption increases comparatively than the other instars, ultimately the bed becomes thick and damp soon. Therefore, it is necessary for daily bed cleaning in this stage, preferably in the morning after one or two feedings. The method of bed cleaning practiced in eri culture is simple and easy. Prior to bed cleaning, a feeding provided with the new foliage. Then the worms along with the new foliage provided and transferred to other bunch, platform and rearing tray carefully.

Spacing of worms

Proper spacing and good aeration keeps the worms healthier. Overcrowding of the worms in the tray leads to competition for food and space and ultimately undernourishment and unhealthy growth of the larvae often resulting in crop loss. In a standard size rearing tray (1.0 m dia), 300 number of fifth stage worms reared conveniently.

Precaution during rearing

Newly hatched silkworms provided tender castor leaves as per pachakage. Daily provided feeding 2-3 times to 1st and 2nd, 3 times to 3rd and 4-5 times to 4th and 5th stage silkworms. Provided tender leaves to 1st and 2nd instar, medium leaves to 3rd instar and mature leaves to 4th and 5th instar worms. For 100 dfls rearing, requirement of leaf is 120 kg for I-III stage, 120 kg for IV stage and 960 kg for V stage larvae. Avoided overcrowding of worms in the brunch, rearing tray or platform. In a rearing tray of 1 m diameter, only 300 nos. worm kept for the fifth stages.

Care during moulting

To complete each moult, it takes about 24 - 28 hrs. During moulting period, larvae not disturbed and no feeding provided to the worms. Kept the rearing tray/platform/brunch dry during moulting period. Feeding given after completion of moulting of 90% worms. A good rearing is judged by the uniformity of the larvae entering into moulting and emerging from moulting. The brushing and feeding of the worms play key role for uniform moulting, if handled properly. As the worms are entering to moult, stop feeding, lethargic and less movement. If 75-80 % of the worms enter into the moult, there is no need to feed the rest of the worms. But provided first feeding only when 80% of the worms emerge out of moult. The worms moult four times during its larval life span. Moulting is a very sensitive period during which the worms cast off its old skin and the body is soft and delicate. The larvae take 24 - 36 hours to complete the moulting process during the different instars and different seasons. It is important to keep the rearing bed dry when the worms are in moult.

Matured worm collection and mounting

After completion of larval life span, the matured 5th stage larvae discarded its complete excreta consisting of liquid and semi-solid substances. Now the worms are ready for spinning cocoons. Before spinning, the worms stop feeding and become restlessly moving here and there to search a suitable place for cocooning. The matured worms produce a hollow sound when it is rubbed gently between fingers. This is the time for picking the ripe worms and putting them on mountages. Before mounting process, the required number of mountages kept ready well in time. The worms collected carefully for mounting. The ripening of the worms takes place during the day time till midday. The mountages used are Bamboo/wooden stripe type collapsible mountage, collapsible plastic mountages and Semi-dry leaves like mango, jack fruit, *etc*. After keeping the optimum number of worms in the respective mountages, it is covered by newspaper or cloth to make support and calm and semi-dark, a suitable condition for cocooning is complete. The quality of cocoon is also dependi upon the type of mountages, density of worms in mounting. During spinning, temperature, relative humidity and aeration influence cocoon quality. The ideal condition for spinning is around 24-25˚C temperature and 60-70 % relative humidity. While mounting, the optimum number of worms maintained per mountages.

Harvesting of cocoons

After completion of spinning the larval skin is cast off and pupation takes place. The last and important step is harvesting of cocoons from the mountage in time. Cocoons harvested after 5-6 days of spinning in summer and 8-9 days in winter. The harvesting process is the best time of sorting of cocoons according to the quality. The cocoons sorted out into good, double, melted, stained, dead or inferior, cut or

pierced cocoons. Good commercial cocoons shifted and dried perfectly after the harvest. Cocoons preserved carefully to protect from fungal infestation and attack from pest and predators. Cocoons assessed on the basis of cocoon weight, shell weight.

Mountages for Eri silkworm

Different types of moutages are used for eri cocoon spinning, these are:

I. Bamboo/Wooden stripe type collapsible mountage,
II. Collapsible plastic mountages and
III. Semi-dry leaves like mango, jack fruit, *etc*.

During cocooning eri silkworm maintained approx. 24-26^0 C temperature and 70-75% RH in the cocooning hall. Always maintained well aeration in the eri cocooning hall. Rearing performance on different food plants, different technology and in different season is tabulated below:

Table 2 : Bunch-rearing technology and use of Bamboo/Wooden tripe type collapsible mountage:

Matured larval weight (g)					
Food plants	**Crop season**				**Av.L.wgt**
	Spring	**Summer**	**Autumn**	**Winter**	
Ricinus communis, **Castor**	**8.20**	**8.0**	**8.10**	**7.90**	**8.05**
Heteropanax fragrans ,**Kesseru**	**7.50**	**7.35**	**7.51**	**7.48**	**7.51**
*Manihot esculenta,***Tapioca**	**7.34**	**7.13**	**7.34**	**7.33**	**7.28**
Ailanthus excelsa **Barkesseru**	**6.95**	**6.85**	**6.90**	**6.86**	**6.89**
Cocoon weight (g)					**Av.C.wgt**
Ricinus communis, **Castor**	**3.50**	**3.30**	**3.40**	**3.20**	**3.35**
Heteropanax fragrans ,**Kesseru**	**3.10**	**3.00**	**3.05**	**3.00**	**3.03**
*Manihot esculenta,***Tapioca**	**2.90**	**2.80**	**2.85**	**2.82**	**2.84**
Ailanthus excelsa **Barkesseru**	**2.76**	**2.70**	**2.74**	**2.62**	**2.70**
Shell weight (g)					**Av. S.wgt**
Ricinus communis, **Castor**	**0.50**	**0.48**	**0.49**	**0.45**	**0.48**
Heteropanax fragrans ,**Kesseru**	**0.44**	**0.39**	**0.43**	**0.41**	**0.41**
*Manihot esculenta,***Tapioca**	**0.39**	**0.34**	**0.35**	**0.34**	**0.35**
Ailanthus excelsa **Barkesseru**	**0.34**	**0.30**	**0.31**	**0.33**	**0.32**
ERR %					**Av. ERR%**
Ricinus communis, **Castor**	**84%**	**78%**	**86%**	**82%**	**82.50**
Heteropanax fragrans ,**Kesseru**	**79%**	**70%**	**76%**	**74%**	**74.75**
*Manihot esculenta,***Tapioca**	**75%**	**71%**	**72%**	**73%**	**72.75**
Ailanthus excelsa **Barkesseru**	**70%**	**69%**	**71%**	**73%**	**70.75**

Table 3 : Tray-rearing technology and use of collapsible plastic mountages:

Matured larval weight (g)					
Food plants	**Crop season**				**Av.L.wgt**
	spring	**summer**	**autumn**	**winter**	
Ricinus communis, **Castor**	**8.10**	**7.90**	**8.05**	**7.80**	**7.96**
Heteropanax fragrans ,**Kesseru**	**7.40**	**7.34**	**7.50**	**7.43**	**7.41**
*Manihot esculenta,***Tapioca**	**7.30**	**7.12**	**7.33**	**7.32**	**7.26**
Ailanthus excelsa **Barkesseru**	**6.90**	**6.84**	**6.85**	**6.76**	**6.83**
Cocoon weight (g)					**Av.C.wgt**
Ricinus communis, **Castor**	**3.40**	**3.10**	**3.20**	**3.15**	**3.21**
Heteropanax fragrans ,**Kesseru**	**3.05**	**2.90**	**3.00**	**3.05**	**3.00**
*Manihot esculenta,***Tapioca**	**2.80**	**2.70**	**2.80**	**2.78**	**2.77**
Ailanthus excelsa **Barkesseru**	**2.75**	**2.70**	**2.72**	**2.60**	**2.69**
Shell weight (g)					**Av. S.wgt**
Ricinus communis, **Castor**	**0.49**	**0.47**	**0.47**	**0.44**	**0.46**
Heteropanax fragrans ,**Kesseru**	**0.43**	**0.38**	**0.42**	**0.40**	**0.40**
*Manihot esculenta,***Tapioca**	**0.38**	**0.33**	**0.34**	**0.33**	**0.35**
Ailanthus excelsa **Barkesseru**	**0.33**	**0.31**	**0.30**	**0.32**	**0.31**
ERR %					**Av. ERR%**
Ricinus communis, **Castor**	**81%**	**77%**	**82%**	**80%**	**80.00**
Heteropanax fragrans ,**Kesseru**	**78%**	**69%**	**75%**	**72%**	**73.50**
*Manihot esculenta,***Tapioca**	**74%**	**70%**	**71%**	**71%**	**71.50**
Ailanthus excelsa **Barkesseru**	**71%**	**68%**	**70%**	**70%**	**69.75**

Table 4 : Platform rearing technology and use of semi-dry leaves of Bannana/Jack fruit *etc*.

Mature larval weight (g)					
Food plants	**Crop season**				**Av.L.wgt**
	spring	**summer**	**autumn**	**winter**	
Ricinus communis, **Castor**	**8.11**	**7.90**	**8.10**	**7.85**	**7.99**
Heteropanax fragrans **,Kesseru**	**7.45**	**7.33**	**7.46**	**7.44**	**7.42**
*Manihot esculenta,***Tapioca**	**7.30**	**7.10**	**7.34**	**7.33**	**7.26**
Ailanthus excelsa **Barkesseru**	**6.84**	**6.81**	**6.84**	**6.73**	**6.80**
Cocoon weight (g)					**Av.C.wgt**
Ricinus communis, **Castor**	**3.30**	**3.00**	**3.15**	**3.16**	**3.15**
Heteropanax fragrans **,Kesseru**	**3.00**	**2.91**	**3.05**	**2.99**	**2.98**
*Manihot esculenta,***Tapioca**	**2.81**	**2.72**	**2.80**	**2.75**	**2.77**
Ailanthus excelsa **Barkesseru**	**2.70**	**2.66**	**2.70**	**2.61**	**2.66**
Shell weight (g)					**Av. S.wgt**
Ricinus communis, **Castor**	**0.48**	**0.45**	**0.47**	**0.45**	**0.46**
Heteropanax fragrans **,Kesseru**	**0.43**	**0.40**	**0.41**	**0.41**	**0.41**
*Manihot esculenta,***Tapioca**	**0.39**	**0.33**	**0.36**	**0.34**	**0.35**
Ailanthus excelsa **Barkesseru**	**0.34**	**0.32**	**0.33**	**0.31**	**0.32**
ERR %					**Av. ERR%**
Ricinus communis, **Castor**	**82%**	**78%**	**81%**	**80%**	**80.25**
Heteropanax fragrans **,Kesseru**	**77%**	**60%**	**76%**	**71%**	**71.00**
*Manihot esculenta,***Tapioca**	**75%**	**71%**	**72%**	**72%**	**72.50**
Ailanthus excelsa **Barkesseru**	**73%**	**67%**	**68%**	**69%**	**69.25**

Result and Discussion

Rearing performance on *Ricinus communis,* Castor, *Heteropanax fragrans*, Kesseru, *Manihot esculenta,* Tapioca and *Ailanthus excelsa* Barkesseru with Bunch-rearing technology and use of bamboo/wooden stripe type collapsible mountage in different season revealed that highest matured larval weight (g), cocoon weight (g), shell weight (g) and ERR% was recorded subsequently 8.05g, 3.35g, 0.48g and 82.50% in Castor only. In case of tray-rearing technology and use of collapsible plastic mountages with different food plants and season found that highest matured larval weight (g), cocoon weight (g), shell weight (g) and ERR% was recorded 7.96g, 3.21g, 0.46g and 80% also in Castor. The platform rearing technology and use of semi-dry leaves of Bannana/Jack fruit *etc*. with different food plants and season found that highest matured larval weight (g), cocoon weight (g), shell weight (g) and ERR% was recorded 7.99g, 3.15g, 0.46g and 80.25% in Castor. From the above experiment it is observed that castor is the best suitable food plants and Bamboo/Wooden stripe type collapsible mountages are found most suitable for cocooning of eri silkworm. The rearing performance of different season of eri silkworm found that, larval weight, cocoon weight, shell weight and ERR% was maximum in the spring and autumn season. The present study confirmed that castor of *Ricinus communis*, Linn found to be the best suited to the larvae of eri silkworm and provides all possible facility and nutrition to the worms for better growth and development and cocoon harvest. The mounting device Bamboo/Wooden stripe type collapsible mountage was found easy to cocoon harvest, time and space saving, which may be use large scale in eri cocoon harvest for growth of eri silk industry.

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