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Research Paper—Zoolgoy

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Improvement of Cocoon Parameters of Erisilkworm(Philosamia ricini) in their Nutritional Level during different rearing seasons

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A B S T R A C T

In the rearing of erisilkworm the quality of leaves directly influence on healthy growth and survival of erisilkworm.. Limiting factor, specially water, mineral nitrogen and mineral phosphorous are supplied in excess to increased the food value of the food plant of erisilkworm and pests are also actively controlled. An investigation on growth in different nutritional level and cocoon characters of Eri silkworms, Philosamia ricini, Hutt on castor, kesseru and the kesseru leaves which treated with foliar spray "Tricovit" through the rearing of the silkworm and chemical analysis of castor, kesseru leaves in different rearing season was carried out The pattern of correlation within and between the nutritional and economic parameters of the silkworm and nutrient contents of castor, kesseru (untreated) and kesseru treated with foliar spray tricovit was studied .

Key Words: Erisilkworm, castor,kesseru,kesseru (treated),larval Duration, Fibroin, Sericin,'Tricovit' foliar spray.

Introduction:

Assam is the homeland of eri-silk. The eri silk a creamy white (stuff) is obtained from eri silk worm (philosamia ricini), which feeds generally on castor leaves. The valley of the river Brahmaputra and surrounding hill areas are considered as the natural home of eri silk worms from time immemorial.

Ericulturs is the exclusive prerogative of the Assam and forms an important part of the Assamese rural life and society. Until recent years few studies have been carried out in respect of consumption and utilization of food an silk producing insect like Bombyx mori (Legacy, 1950, ito, 1967 and Horie, 1978) and philosamia ricini Hutt. (Kaptl, 1963, 1967). Literature contain a few studies an effect of different food plants in respect of quality leaves that directly influence on health, growth and survival of erisilkworm, P. ricini (Joshi and Mishra 1979, Jorhi 1986, Pathak, 1980, Joshi 1992) Lohit Ch. Dutta (2000), V. Nagaveni, M. P. Shree and K. Ravikumar (2002), B. K. Singh and P. K. Baruah, Dept. Of Botany, Cotton College, Assam (2010) Hence with a view to improve the food value of the kesseru by spraying the foliar spray on leaves for erisilk worm rearing, the present study was undertaken with the following objectives-

1. To evaluate the efficiency of these food plants on cocoon parameters of *erisilkworm*.

Materials and methods:

To study the nutritional efficiency of erisilkworm the larvae were reared on three food plants viz, Kesseru (normal), Kesseru (treated) and castor for make a comparison of these separately under laboratory condition at 27.75 ± 30 c and 82.8 ± 7% RI + from first to 5th instar following the technique of Poonia (1978) and Joshi (1986). With a view to understand the suitabilities of food plants (Castor, Kesseru and the leaves of kesseru which were treated by foliar spray 'tricovit' for rearing of erisilkworm, a study on nutrition, growth and cocoon characters of erisilkworm, P. ricini on three different food plant, that are castor, Kesseru and the treated Kesseru was carried out in Zoology Department of Madhabdev College in 2009-10.. Here the one Kesseru tree used for the investigation was 5 mitres in height.

The leaves of the trees were treated by spraying the foliar spray 'Tricovit' as 2 teaspoonful powder + 10 liter of water. These solutions were sprayed on the both the surface of the leaves in the morning. After 7 days these leaves become deep green, because it encourages the process of photosynthesis Nitrogen Cycle and Strong of Carbohydrate resulting the healthy plants. It also supplies Protein, Hormone and other minerals contents to the plants, which control different types of diseases. These were fed by the eri silkworm after hatching to the 3rd larval stages. The experiment was laid out in Completely Randomised Design (CRD) for various estimations of nutrition growth and cocoon characters. The determination of the various experiments has been subjected to ANOVA in order to separate out all possible errors.

Experimental Findings :

Data on larval growth and economic cocoon parameters of P. ricini reared on 3 different food plants on different rearing seasons are presented in Table 1,2,3.

1.Fibroin Content :

Table 1 represents the fibroin contents varied significantly among the different food plants varieties that are used. Among these food plants the highest amount of fibroin content was recorded on Castor (82.46%) which was at par with Kesseru (treated) (80.99%). Though the lowest amount of fibroin content was ac-

Table 1- Effects of food plants on Fibroin content (%) on the cocoon shell of P. ricini in different season

Food plants	Spring	Summer	Late summer	Autumn	Mean
H. fragrans (Un)	80.09	80.79	80.92	81.15	80.73
H. fragrans (T)	80.56	80.80	80.99	81.64	80.99
R. communis	81.87	81.99	82.56	83.43	82.46
Mean	80.84	81.19	82.56	83.46	

counted for Kesseru (Untreated) (80.73%) at did not differ significantly from that of Kesseru (Treated) (80.99%). The interaction effects due to season × food plants are not significant. Among the seasons the autumn rearing silk cocoon was recorded the highest fibroin content (83.46%), followed by late summer (82.56%). Summer (81.19%) and lowest was recorded on spring season (80.84%)

2.Sericin Content :

Sericin Content on the cocoon shell of eri silkworm fed on different rearing seasons is presented in table 2. Results revealed that sericin content differed significantly among the food plants varieties. Among the food plants the lowest sericin content was recorded on Castor (17.64%). followed by (i) Kesseru (treated) (19.04%) and highest on Kesseru (Untreated) (19.55%). Though Kesseru (treated) (19.04%) was recorded the lower value of sericin content than Kesseru (Untreated) (19.55%) did not differ significantly. The interaction effect due to the season x food plants was non significant. Among the season, spring rearing cocoon shell was recorded the highest amount of sericin content (19.18%) followed by Summer (19.09%), late summer (18.68%) and lowest on autumn (18.03%)season.

Table 2Effect of food plants on sericin contents (%) on the cocoon shell of P. ricini in different season

Food plants	Spring	Summer	Late summer	Autumn	Mean
H. fragrans (Un)	19.91	19.82	19.63	18.85	19.55
H. fragrans (T)	19.44	19.34	19.01	18.36	19.04
R. communis	18.19	18.10	17.40	16.87	17.64
Mean	19.18	19.089	18.68	18.03	

3.Larval duration: The mean data of larval duration of eri silkworm on different food plants in different rearing seasons are presented in Table 3.Data showed the shortest larval duration was recorded on summer (20 days) followed by late summer (21 days) spring (24.67 days) and the longest on autumn (28.67 day) season.Among the food plants the shortest larval duration was recorded on Castor (20.75 days). Between the 2 tested food plants, the larval duration was recorded shorter on Kesseru treated (23.50 days) than the Kesseru untreated (26.50 days).

Table 3. - Effects of food plants on larval duration of P. ricini in different season .

Food plants	Spring	Summer	Late summer	Autumn	Mean
H. fragrans(Un)	29	22	23	32	26.50
H. fragrans (T)	24	20	21	29	23.50
R. communis	21	18	19	25	20.75
Mean	24.67	20.00	21.00	28.67	

Discussion and Conclusion: The results of larval duration and larval weight indicated that the food plants had significant effect on them. The larvae reared on castor (R. communis) recorded the highest value of larval weight and took the shortest duration to complete its larval period. In between three evaluated kesseru (H. fragrans) control and kesseru (H. fragrans) (treated), in later case the shorter duration was recorded to complete its larval period.

Similar observation were made by Viswakarma and Thangavelu (1982) and reported that the characters of cocoon primarily depends upon the larval weight. Kapil (1967) also observed similar results on P. ricini. From their opinions it could be inferred that the occurrence of higher values of cocoon weight, shell weight and pupal weight on the food plants of R. communis and H. fragrans in the present study might be due to their higher larval weight gain at the end of the larval feeding period.

From the study it became evident that H. fragrans(kesseru) (treated) emerged as the most efficient food plant for rearing of eri silkworm P. ricini then on the H. fragrans (kesseru) (untreated) because of betterlarvel duration, shell weight fibroin content pupal weight. This might be due to supplying of extra nutrient by spraying foliar spray on the leaves of kesseru, which contain more Carbohydrate, more nitrogen, more minerals. However, the better results in all aspects of the study were obtained in the most suitable host plant castor, Ricinus communis(castor) than on the other two tested kesseru.

Suggestion: Thus the present study suggests that the farmers can be used such foliar spray in the Kesseru leaves to increase the nutrition value of erisilkworm for better rearing performance in present environmental condition.

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