



Science

**RELATIVE IMPACTS OF DIFFERENT SEASONS ON THE QUALITIES  
ERI SILK COCOONS AND ERI SILK YARN OF FOUR DIFFERENT  
MUTANT STRAINS OF *Philosamia ricini* Bsd.**

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**ABSTRACT**

*The relative impacts of different seasons of ericulture namely May-June, July-Aug., Sep.-Oct. and Nov.-Dec on the qualities of erisilk cocoons and erisilk yarn of four different mutant strains of *Philosamia ricini* Viz; Yellow plain, Yellow zebra, G.B. plain and G.B. zebra have been evaluated under the reeling parameters. Results obtained indicate that the reeling performances of G.B. plain mutant strain is best in the season May-June (summer) followed by July-August (Rainy) and are relatively better in respect of qualities of eri cocoons and eri silk yarn in comparison to two other seasons namely September-October and November-December. The said variations are probably on account of the fact that May-June followed by July-August seasons provide relatively better and conducive eco-friendly environment to mutant strain than two other seasons of eri culture in respect of cocoon weight, shell weight, shell ratio, filament length of eri silk yarn, rate of eri silk tenacity of fibre and elongation percentage of fibre. The significant variations in relation to four different seasons in the qualities of eri cocoons and eri silk yarn of yellow plain mutant strain of *Philosamia ricini* (the popular eri silkworm among the four mutant strains) also have been found relatively better in respect of qualities of eri cocoons and eri silk yarn in all the seasons in spite of evident variation on account of genetic variabilities and differences in the genetic make-up of mutant strains.*

**Keywords:**

*Seasonal variation, qualities of eri silk cocoon, silk yarn four mutant varieties, *Philosamia ricini*.*

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## 1. INTRODUCTION

Among the non-mulberry silkworm, the *Philosamia ricini* Bsd is the main eri silkworm commonly reared on different host plants in Assam, Kerala, West Bengal and some part of Bihar and Jharkhand. The adult mouth is stout and dark and the wings are darkish brown and white. It deposits 120-200 eggs in cluster. The caterpillars feed on the foliage of castor and kesseru which is primary food plants. Larval period varies between 17 to 25 days. The four different mutant strains of *Philosamia ricini* viz; yellow plain, yellow zebra, G.B Plain, G.B Zebra has been evaluated under the reeling parameters in different seasons like May-June, July-August, September-October and November-December. Among four mutant strains Yellow plain is the best in all respect of productivity in month of May to June.

## 2. MATERIALS AND METHODS

The healthy cocoons of *Philosamia ricini* of four different strains namely yellow plain, yellow zebra, G.B Plain and G.B Zebra with uniform weight and size were selected for the present experiment. The male and female moths were put in a bigger bamboo baskets for pairing. The diseases free eggs of different strains of *Philosamia ricini* were washed with 5% formalin solution for 5 minutes for surface sterilization. The disinfected eggs of different strain were kept in specially designed egg boxes having transparent top to permit light and perforated side for aeration. The filled up egg boxes were kept in incubation room usually at 28°C to 30°C and as per the suitability of hatching of *philosamia ricini*. The rearing were conducted on different host plants during different seasons from May to Dec. by providing tender semimature and mature foliage to freshly hatched young age larva.

## 3. RESULT AND DISCUSSION

The relative impacts of different seasons of ericulture namely May-June, July-Aug., Sep.-Oct. and Nov.-Dec. on the qualities of erisilk cocoons and erisilk yarn of four different mutant strains of *Philosamia ricini* viz; Yellow plain, Yellow zebra, G.B. plain and G.B. zebra have been evaluated under the reeling parameters and results so obtained are recorded are the following - Yellow plain mutant strain of *Philosamia ricini*, that the qualities of ericocoon and erisilk yarn in different seasons namely May-June, July-Aug., Sep.-Oct. and Nov.-December in respect of cocoon weight (4.12, 3.98, 3.42 & 3.22gms.), shell weight (0.56, 0.52, 0.48 and 0.43 gms.), shell ratio (13.96, 13.10, 12.63 and 12.54%), length of erisilk yarn (2513, 2498, 2310 and 2292 mtrs.), size of erisilk (13D, 12D, 10D & 9D) Production rate of erisilk per hour (13.77, 13.10, 12.08 & 11.92 gms.) tenacity of fibre (1.99, 1.72, 1.43 and 1.30 gld) and elongation percentage of fibre (14.0, 12.0, 10.0 & 9.0) respectively present significant variations in relation to four different seasons in the qualities of ericocoons and erisilk yarn of Yellow plain mutant strain of *Philosamia ricini* the popular eri silkworm. It further reveals that the relative reeling performances of Yellow plain mutant strain of *Philosamia ricini* is relatively better during May-June Season followed by July-Aug. season as compared to Sep.-Oct. and Nov.-December seasons. It is thus very clear that seasons influence the qualities of eri cocoons and its yarn as evidenced by the relative seasonal impacts on Yellow mutant strain of *Philosamia ricini*. It clearly indicates that the qualities of eri cocoon and eri silk yarn of Yellow zebra mutant strain of *Philosamia ricini* in respect of cocoon weight (3.72, 3.60, 3.10 and 3.0gms.), shell weight (0.48,

0.41, 0.38 and 0.34gms.), shell ratio (12.05, 11.98, 10.95 and 10.38%), length of eri silk yarn (2216, 2198, 2100 and 2090mtrs.), size of eri silk (11D, 10D, 9D and 8D), production rate of eri silk per hour (8.66, 8.10, 7.12 and 6.92gms.), tenacity of eri silk fibre (1.33, 1.29, 1.13 and 1.10g/d) and elongation percentage (10.0, 10.0, 9.0 and 8.0) during the seasons May-June, July-August, September-October, and November-December respectively present significant relative variations showing evident impacts of four different seasons on the qualities of eri cocoon and eri silk yarn of zebra mutant strain of *Philosamia ricini*. It is thus very clear that the zebra mutant strain of *Philosamia ricini* get influenced by the seasonal changes resulting into significant variations in the qualities of eri silk cocoon and eri silk yarn in relation to seasons. Results obtained are indicative of following facts: Yellow zebra mutant strain of *Philosamia ricini* has been found to present significant variations in its reeling performances in respect of qualities of eri cocoons and eri silk yarn in relation to four different seasons. The qualities of eri cocoon and eri silk yarn of Yellow zebra mutant strain of *Philosamia ricini* have been found relatively better in May-June followed by July-August as compared to September-October and November-December seasons on accounts of the relative impacts of four different seasons of eri culture (May-June, July-August, September-October and November-December) on the qualities of eri cocoons and eri silk yarn of G.B. plain mutant strain of *Philosamia ricini* in respect of its reeling parameters. It indicates that the cocoon weight (4.0, 3.82, 3.21 and 3.16gms.), shell weight (0.54, 0.51, 0.42 and 0.40gms.), shell ratio (13.10, 12.98, 12.10 and 11.99%), length of silk yarn (2479, 2410, 2312 and 2298mtrs.), size of eri silk (12D, 11D, 9D and 8D), rate of production of eri silk per hour (12.95, 12.10, 11.35 and 10.98gms.), tenacity of eri silk fibre (1.92, 1.78, 1.62 and 1.59) and elongation percentage of fibre (13.0, 12.0, 10.0 and 9.0%) of G.B. plain mutant strain of *Philosamia ricini* during the different seasons May-June, July-August, September-October and November-December respectively present evident variations like other strains in respect of qualities of eri cocoons and eri silk yarn in relation to four different seasons. Thus the results obtained account for significant seasonal variations showing impacts of seasonal differences on the reeling performances of G.B. plain mutant strain of *Philosamia ricini* evaluated for the qualities of eri cocoons and eri silk yarn. The result obtained further show that the reeling performances of G.B. plain mutant strain in the seasons May-June, (Summer) followed by July-August (Rainy) are relatively better in respect of qualities of eri cocoons and eri silk yarn as compared to two other seasons namely September-October and November-December. The said variations are probably on account of the fact that May-June followed by July-August seasons provide relatively better and conducive eco-friendly environment to mutant strain than two other seasons of eri culture. Table further accounts for the relative variations in the qualities of eri cocoons and eri silk yarn of G.B. zebra mutant strain of *Philosamia ricini* in relation to impacts of four different seasons. Table reveals that the cocoon weight (3.62, 3.51, 3.12 and 3.0gms.), shell weight (0.43, 0.41, 0.36 and 0.31gms.), shell ratio (11.98, 11.35, 10.98 and 10.70%), length of eri silk yarn (2192, 2110, 2050, 2031mtrs.), size of eri silk (10D, 9D, 8D and 7D), rate of production of eri silk per hour (8.39, 8.30, 7.51 and 7.12gms.), tenacity of fibre (1.31, 1.28, 1.10 and 1.02g/d) and elongation of fibre (10.0, 10.0, 9.0 and 8.0%) of mutant strain (G.B. zebra) present significant variations in respect of qualities of eri cocoons and eri silk yarn during four different seasons respectively namely May-June, July-August, September-October and November-December showing significant impacts of different seasons on the qualities of eri cocoon and eri silk fibre of G.B. zebra mutant strain. It clearly reveals that the qualities of eri cocoons and eri silk yarn of G.B. zebra mutant strain of *Philosamia ricini* are relatively better during the May-June season followed by July-August season that the September-October and

November-December season. It is thus very clear that summer and rainy seasons as compared to autumn and winter seasons provide relatively better and conducive ecological conditions.

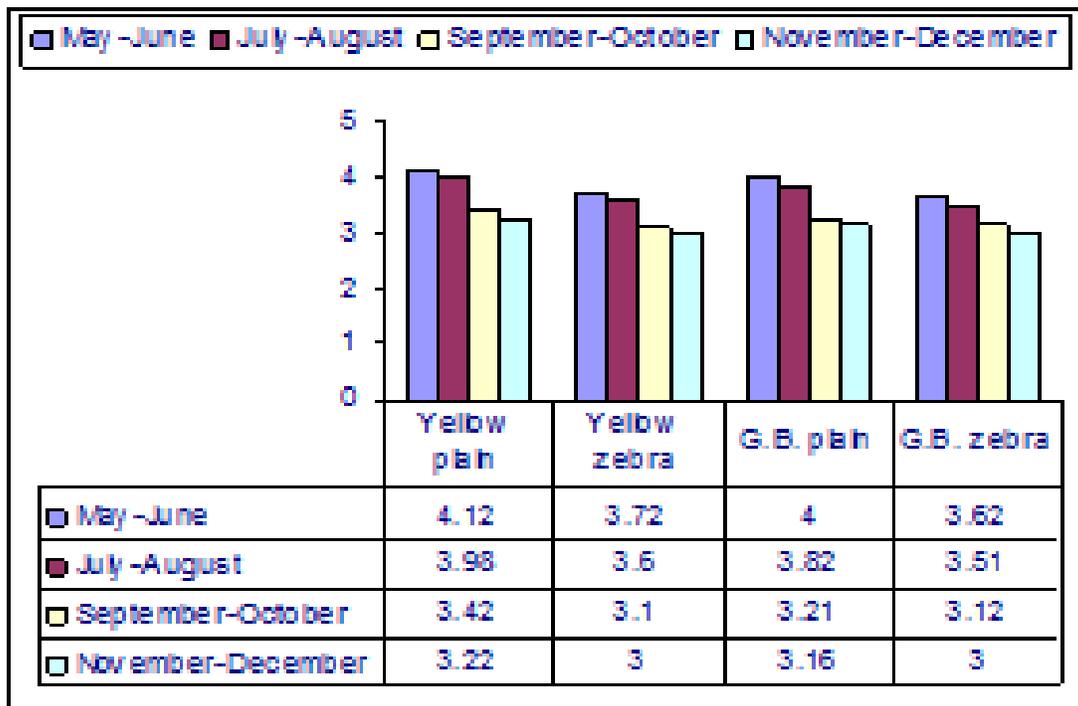


Figure 1: Showing relative impact of four different seasons on the cocoon weight of four different mutant strains of *Philosamia ricini* Bsd.

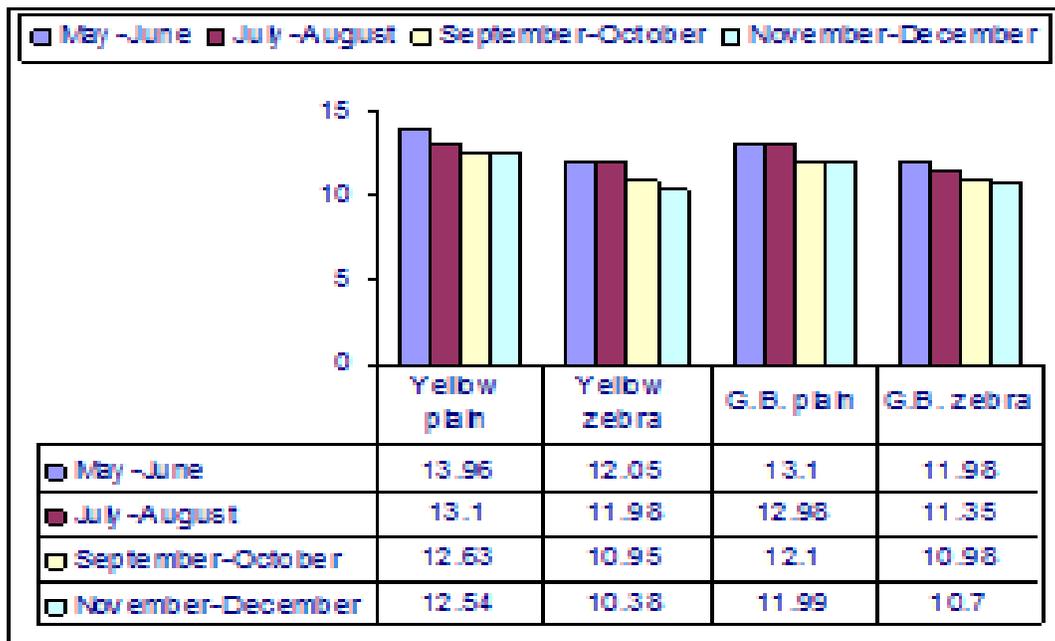


Figure 2: Showing relative impact of four different seasons on the silk ratio percentage of four mutant strains of *Philosamia ricini* Bsd.

#### 4. CONCLUSION

On the month of May-June and July-August seasons provide better environmental condition suited for eri silkworm as a result better reeling performances of mutant strains in the said desired environmental conditions as compared to other seasons appear to be logical outcome result obtained. The reeling performances of yellow plain and G.B Plain have been found relatively better in respect of qualities of eri cocoons and eri silk yarn.

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