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Economic Cocoon Parameters of Barpat (*Bombyx mori*) Silkworm on Different Mountages

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Abstract

A study was conducted during the two consecutive years, 2023-24 in the Department of Sericulture, Assam Agricultural University, Jorhat. The present experiment was taken to determine the accomplishment of waste material as mountages for Barpat (*Bombyx mori*) mulberry silkworm. The rearers occasionally do not have access to bamboo-made common mountages like chandraki. The waste materials like dried banana leaves, egg plates and newspaper were utilized to compare with the chandraki, the common mounting device. Three replications for each mountage were maintained separately for calculating the cocoon parameters. The separation of cocoons was done after the completion of the cocoon formation from each mountage. The significance difference of the economic cocoon parameters such as cocoon weight (g), shell weight (g) and shell ratio percentage were calculated by using a Completely Randomised Design. The results depicted that significant difference in cocoon weight (g) and shell ratio percentage were not found except in shell weight (g). The weight of the cocoon weight (1.450 g) and shell ratio (14.727) percent were observed highest in the chandraki but the highest value of shell weight (1.157 g) was observed in the egg plate. The shell ratio percentage in all the waste materials used as mountages showed similar results to chandraki. In case of scarcity of chandraki, these waste materials can be used as mountages by silkworm rearers.

Keywords: Barpat, Cocoon parameters, Mountages, Mulberry silkworm, Waste products

Introduction

Sericulture is an age old ago-based industry that is originated in China thousand years ago and it is gradually spread to different regions across the globe. The main objective of the rearing of silkworm is to get the ultimate end product *i.e.*, raw silk which is known as "Queen of Textile". Silkworm is grouped under holometabolous insect because it has four different life stages *viz.*, egg, larva, pupa and moth stages. The larval stage is the only feeding stage among the four other stages. After the completion of fifth instar larval stages, they spin the cocoon from where the silk is extracted. This cocoon spinning stage is the most crucial stage of its life. Therefore, utmost care should be taken while mounting the worms into the mountages for quality cocoon formation. Borpat, a univoltine race of mulberry silkworm, have only one generation in a year. Silk-producing insects secrete silk when they become matured and finally transformed into cocoon stage. This is the most crucial stage for getting good quality as well as quantity cocoons (Narzary *et al.*, 2014). Moreover, the mounting device also plays an important role in quality cocoon production. Mountage is defined as a device that provides the platform to the mature silkworm larval to spin the cocoon. Proper selection of mounting devices also an important factor for cocoon spinning phase. Though, different types of mountages are available for keeping the mature worms to form their cocoons, each of them having some advantages as well as some disadvantages. A well-designed mounting system supports the silkworms in an

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ideal position, promoting uniform cocoon formation. This uniformity is essential for high-quality silk, as irregularly shaped cocoons can lead to weaker silk threads. Once the cocoons are formed, they are harvested and reeling is done to extract the silk thread. A proper mounting system or device facilitates the easy collection of cocoons, making harvesting quicker and minimizing damage to the silk during extraction. Narrow space in the cocoon spinning devices inhibits airflow for larvae and resulting in inferior quality of cocoons, while wider space leads in waste of silk in the form of floss (Mathur and Qadri, 2010). Devices that streamline the spinning and harvesting processes can reduce labour costs and time, allowing for better resource management in sericulture operations. This process must be handled delicately to maintain the quality of the silk.

Materials and Methods

The experiment was carried out on an univoltine (Barpat) mulberry race, at the Department of Sericulture, Assam Agricultural University, Jorhat, (Lat. 26.723211°; Long. 94.194112°) for two consecutive years, 2023-24. The first to fifth instar *B. mori* (Barpat) silkworm larvae were reared under natural room temperature and humidity condition following tray rearing technique (Chowdhury, 1982). The matured larvae were collected and transferred to the four different mountages, *viz*., chandraki, egg plate, newspaper and dried banana leaves. Three replications for each mountages were maintained separately for calculating the cocoon parameters. The cocoons were harvested from each mountages after completion of cocoon formation. The different economic cocoon parameters- cocoon weight (g), shell weight (g) and shell ratio (%) were calculated by adopting Completely Randomised Design. The experimental errors of the various effects were determined by calculating their respective F-values as described by Panse and Sukhatme (1989).

Results and Discussion

The economic yield parameters of the cocoon directly associated with price of cocoons in commercial sericulture are single cocoon weight (g) shell weight (g) and cocoon shell ratio percentage. The cocoon parameters on different mountages were presented in table 1.

Cocoon Weight (g)

It is an important parameter for assessment of cocoon quality. The weight of the cocoon shell is one of the important quality parameters largely influenced by type, material and structure of mountages used at the spinning stage (Singh *et al*., 1994). Cocoon weight was recorded higher in case of the cocoon harvested from chandraki (1.450 g), followed by the cocoon harvested from dried banana leaves (1.147 g), egg plate (1.170 g) and lowest was recorded in newspaper mountage (1.057 g) (Figure 1). The type of mountage did not show any significant difference in case of cocoon weight which indicates their suitability for mounting of silkworm to form cocoon as chandraki. The present findings on cocoon weight are also supported by the results of Shinde *et al.* (2012).

Table 1: Cocoon parameters on different mountages

Mountages	Cocoon weight (g)	Cocoon Shell weight (g)	Cocoon Shell ratio (%)
Chandraki	1.450	0.370	14.727
Dried banana leaves	1.170	0.180	13.193
Egg plate	1.147	1.157	12.597
News paper	1.057	1.140	12.373
S.Ed.	0.136	0.039	1.005
CD (5%)	N/A	0.092	N/A

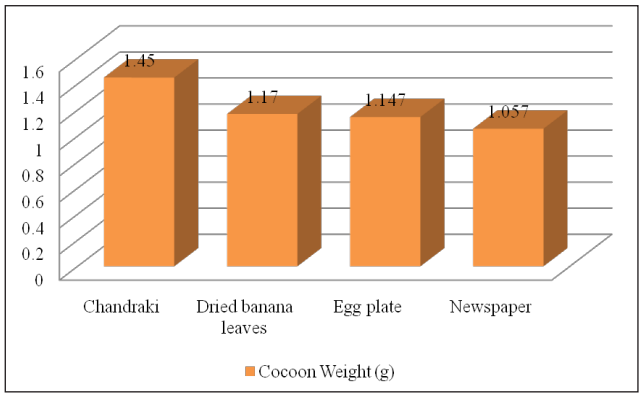

Figure 1: Cocoon weight on different mountages

Shell Weight (g)

In the case of shell weight also it shows similar trends as in weight of the cocoon. The highest weight of the shell was significantly observed in egg plate (1.157 g) followed by newspaper (1.057 g), chandraki (0.370 g) and the lowest in dried banana leaves (0.180 g) (Figure 2). The shell weight was found to be significant. The results are in accordance with the findings of Vinoda *et al.* (2021).

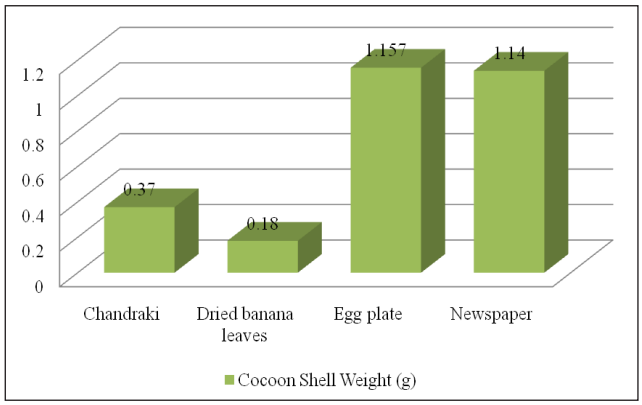

Figure 2: Cocoon shell weight on different mountages

Shell Ratio (%)

The percent content of the cocoon shell of the Borpat, univoltine race (*B. mori*) was found highest in chandraki (14.727) which was followed by dried banana leaves (13.193), egg plate (12.597) and newspaper (12.373) (Figure 3). The results did not show any significant difference among the mountages. The more or less similar results on eri silkworms of using Mango tree twig mountage was also reported by Naphade *et al.* (2010).

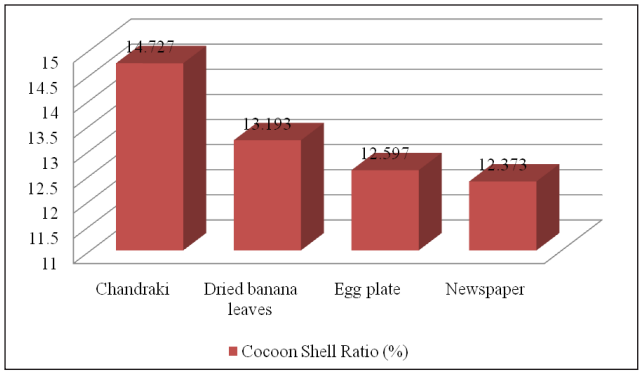

Figure 3: Shell ratio on different mountages

The cocoon quality largely depends on the materials or devices used at the time of spinning of silkworms (Singh *et al.*, 1994). The results from the present study indicate that rearers can use eco-friendly waste materials like dried banana leaves, egg plates and news paper for mounting the mature worms for cocoon formation which is much cheaper than the bamboo mountages or chandraki. Mango twigs, paddy straw, semi-dried eucalyptus leaves (Pandey *et al.*, 2006; Naphade *et al.*, 2010), twigs of *Indigofera heterantha* and *Pinus excela* (Rashid *et al.*, 2018) are the abundantly available natural plant parts which serve as better alternatives to the plastic mountages as well as chandraki (bamboo made) and can reduce the cost of cocoon production.

Conclusion

The best mounting devices help the mature larvae to secrete more silk protein which form strong filament for continuous unwinding to get better quality raw silk. The cost-effectiveness and availability of dried banana leaves, egg plates and newspapers present significant advantages for sericulture practices. These waste materials are very cheap, easily available and quite economic for the farmers as compare with the chandraki. This transition to waste can lead to sustainable silk production, benefiting both farmers and the silk industry. Overall, adopting dried banana leaves as well as the egg card and newspaper as mounting material can be recommended to enhance silkworm rearing efficiency and improve economic outcomes in sericulture. Future research could explore the long-term impacts of this alternative on silk quality and production scalability. Thus, the present investigation inferred that the dried banana leaves, egg plate and newspaper can serve as the best alternative to bamboo mountage *i.e.*, the chandraki.

References

Chowdhury, S.N., 1982. *Eri Silk Industry.* Directorate of Sericulture and Weaving, Assam, India. pp. 24-25.

Mathur, V.B., Qadri, S.M.H., 2010. *Manual on Mountages, Mounting and Harvesting Technology for Quality Cocoon Production*. Central Sericultural Research and Training Institute, Central Silk Board, Ministry of Textiles, Govt. of India, Manadavadi Road, Srirampura, India. pp. 9-16.

Naphade, S.T., Hiware, C.J., Avhad, S.B., 2010. Development of improved mountage using mango plant twigs during lack of sufficient number or absence of mountages on field for silkworm cocoon. *Recent Research in Science and Technology* 2(7), 05-08.

Narzary, N., Bhattarcharjee, J., Khanikor, D.P., Patgiri, P., Singha, T.A., 2014. Effect of mountages on cocoon and reproductive parameters of eri silkworm (*Samia ricini* Boisduval). *Journal of Experimental Zoology, India* 17(2), 609-611.

Pandey, R.K., Khan, M.A., Dhar, A., Chauhan, S.S., 2006. Performance of different locally available plant materials for mounting of silkworms. In: *Proceedings of Regional Seminar on Prospects and Problems of Sericulture as an Economic Enterprise in North West India*. November 11-12, 2006. pp. 190-193.

Panse, V.G., Sukhatme, P.V., 1989. *Statistical Methods for Agricultural Workers*, 5th Edition. Indian Council of Agricultural Research, New Delhi. p. 359.

Rashid, H., Khan, G.A., Babulal., Ghosh, M.K., 2018. Field evaluation of different locally available mounting materials for their suitability under hilly areas of Kashmir. *International Journal of Current Microbiology and Applied Science* 7(6), 1597-1605. DOI: https://doi.org/10.20546/ijcmas.2018.706.191.

Shinde, K.S., Avhad, S.B., Jamdar, S.V., Hiware, C.J., 2012. Comparative studies on the performance of mountages on cocoon quality of *Bombyx mori* L. *Trends in Life Sciences* 1(4), 8-11.

Singh, G.B., Rajan, R.K., Inokuchi, T., Himantharaj, M.T., Meenal, A., Datta, R.K., 1994. Studies on the use of plastic bottle brush mountages for silkworm mounting and its effect on cocoon characters and reelability. *Indian Journal of Sericulture* 33(1), 95-97.

Vinoda, K.S., Sahana, K.P., Banuprakash, K.G., 2021. Design and evaluation of eco-friendly mountages for the silkworm, *Bombyx mori* L. *International Journal of Agricultural Sciences* 17, 79-86. DOI: https://doi.org/10.15740/HAS/IJAS/17-AAEBSSD/79-86.