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# Autumn Rearing Performance of SH$_6$ and NB$_4$D$_2$ Bivoltine Silkworm Breeds by Feeding S-$_{1635}$ Mulberry Genotype

## Abstract

Two bivoltine silkworm pure breeds *viz.,* SH$_6$ and NB$_4$ D$_2$ were reared at Silkworm Seed Production Centre, Udhampur, during 2019-20. Results revealed that, silkworm larvae reared during autumn season by feeding S1$_{635}$ leaves recorded the highest average yield (30.700 kg/100 dfls) for SH$_6$ breed , in the case of NB$_4$ D$_2$ breed the average yield was found (14.950 Kg/100 dfls). Pupation percentage was also recorded highest in SH$_6$ breed (77%). The results clearly shows that SH$_6$ breed performed better in terms of imparting better larval rearing and cocoon economic parameters.

**Keywords:** Cocoon Characters, Mulberry, Pupation, Rearing, Yield.

**Introduction**

Udhampur is one of leading district in silk production having varied topography ranges from hills and mountains. The climatic conditions is well suited for the production of bivoltine silk but it has observed for the last few years that bivoltine breeds yield are not stabilized as it was expected. In entire J&K (UT) two crops are being taken by the farmers in a year but autumn crop always not give desired results in the field because of poor quality of leaf available during autumn seasons that obviously affects the health of silkworms and cocoon crop (Nooruldin *et al.,* 2015). Now-a-days efforts are being made to enhance the cocoon crop production by popularizing an additional commercial crop for autumn (Amardev Singh *et al.,* 2013). Leaf quality and quantity not only influence the silkworm growth and development, but also the cocoon production as well as quality of raw silk. Good variety of mulberry, appropriate agronomic practices and plant protection measures determine the quality of leaves (Aruga, 1994). Mulberry leaves contain a rich source of protein and amino acids which influence the shell weight of cocoon (Seidavi *et al.,* 2005). The nutritional composition of mulberry leaves vary with cultivars and could also influence the larval growth and cocoon production (Nagaraju, 2002) which ultimately reflect in the economic traits namely larval weight, cocoon and shell weight (Ravikumar, 1988). The quality of mulberry leaves and environmental conditions influence the dietary efficiency and growth of silkworm (Bongale and Chaluvachari, 1996). The performance of any mulberry variety with respect to leaf quality and cocoon production varies with agro-climatic conditions and cultivation practices.

Hence, the present study was carried out with the objective to assess the performance of two silkworm pure reeds by feeding S$_{1635}$ mulberry genotype.

**Aim of the Study**

To assess the performance of two silkworms pure breeds under autumn condition for utilization of their seed cocoons in seed production process

**Materials and Methods**

The present investigation was carried out to assess the rearing performance of two pure breeds during autumn, 2019 at Silkworm Seed production Centre, Udhampur J&K (UT). A total of 100 dfls each of SH$_6$ and NB$_4$D$_2$ were reared during autumn season. Mulberry leaves of a well established mulberry plantation of S-$_{1635}$ for chawki rearing as well as late age rearing was used for the study. During this period silkworms were fed four times a day during chawki rearing and three times a day during advanced stage with fresh leaves harvested daily from the mulberry garden during the early hours of the day and stored to maintain moisture by

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covering wet gunny cloth. The temperature and relative humidity were maintained respectively for which a thermo-hygrometer was used to record the temperature and relative humidity in the rearing room. Recommended silkworm rearing method was adopted as suggested by (Krishnaswami *et al.*,1978). The data on some economically important traits such as good cocoon percentage (%), single cocoon weight (g), single shell weight (g), shell percentage (SR%), pupation rate (%), cocoon yield per 100 dfls, actual cocoons per kg and melted cocoons per kg were collected and the results are presented in the form of graph 1-3. Plastic collapsible mountages were used for spinning the matured silkworms and the cocoons were harvested after 7$^{th}$ day of spinning. Ten cocoons each were randomly selected for the assessment of economic parameters for depicting the results and the following formulae were applied for ascertaining the traits results shown as under ;

1. Cocoon weight (g): After complete spinning of the cocoons, ten cocoons were weighed and the mean was expressed in gram.
2. Shell weight (g): The shell weight was recorded from selected ten cocoons by cutting open the cocoon and mean were expressed in gram.
3. Shell (%): The shell percentage was determined by using the following formula. The mean was expressed in percent.

$$\frac{\text{Shell weight (g)}}{\text{Cocoon weight (g)}} \times 100$$

4. Pupation rate (%) After harvesting, the healthy cocoons were sorted out by removing melted, double and infected cocoons, and pupation rate was calculated by using the formula and expressed as percentage.

**Pupation rate (%)**

$$\frac{\text{Number of good or healthy cocoons per Kg}}{\text{Actual number of cocoons per Kg}} \times 100$$

**Results & Discussion**

Six economic traits of data pertaining to assessment of autumn rearing performance of two pure breeds *viz.,* single cocoon weight (g), single shell weight (g), shell (%) Single,), pupation rate (%), yield per 100 larvae by weight and good cocoons per kg were presented in Fig (1-3). The present findings indicate that, the performance of the silkworm larvae reared during autumn season by feeding S-$_{1635}$ mulberry genotype recorded that highest single cocoon weight 1.162 (g) and shell % (20.64 %) were recorded in the NB$_4$D$_2$ pure breed when compared to SH$_6$ pure breed (Fig-1). The pupation percentage was also found highest in SH$_6$ pure breed (77%) when compared to NB$_4$D$_2$ pure breed (63%) (Fig-2). The highest average yield (30.700 kg/100 dfls) for SH$_6$ breed , in the case of NB$_4$ D$_2$ the average yield was found (14.950 Kg/100 dfls) (Fig-2). The results clearly shows that SH$_6$ breed performed better in terms of imparting better larval rearing and cocoon economic parameters. The present investigation were in agreement with the findings of Kumar *et al.,*(2017), Sannappa *et al.,* (2002) and Nooruldin *et al.,* (2015), who also reported that health of larva depends on quality of leaf .

**Conclusion**

The results of the present investigation revealed that the SH$^6$ pure breed has performed better during autumn season in terms of imparting better larval rearing and some of the cocoon economic parameters studied but due to lesser pupation rate it was not utilized for egg production process.
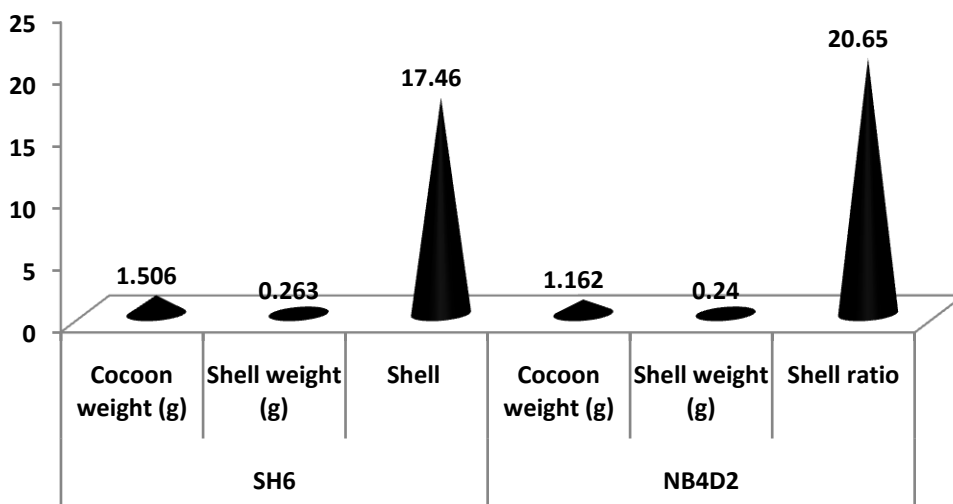


**Fig 1.  Performance of SH6 and NB4 D2 breed on Single Cocoon Weight, Single Shell Weight  and Shell %.**
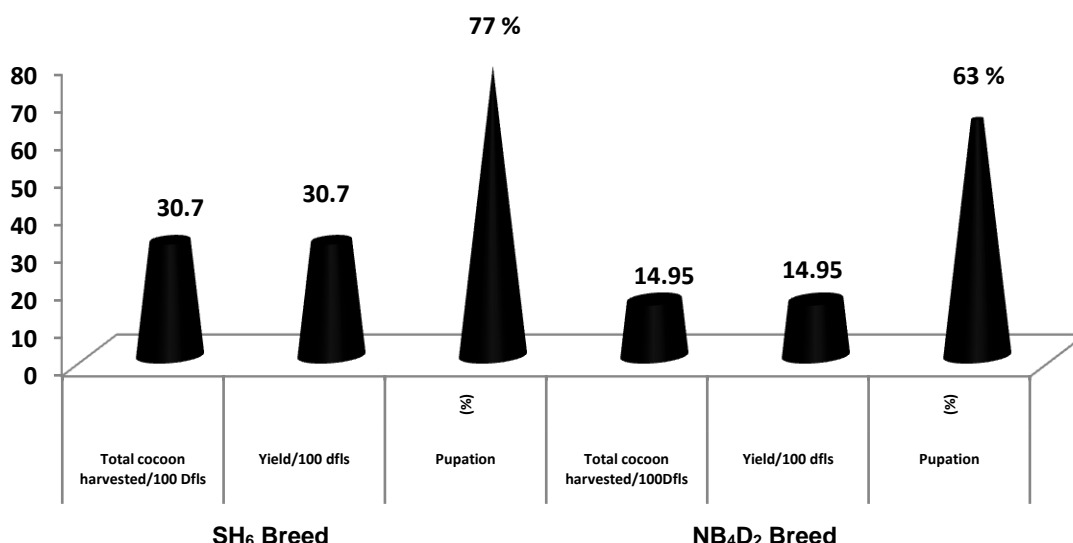
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**Fig 2. Performance in terms of total cocoon harvested/100dfls, yield/100 dfls, pupation percentage**
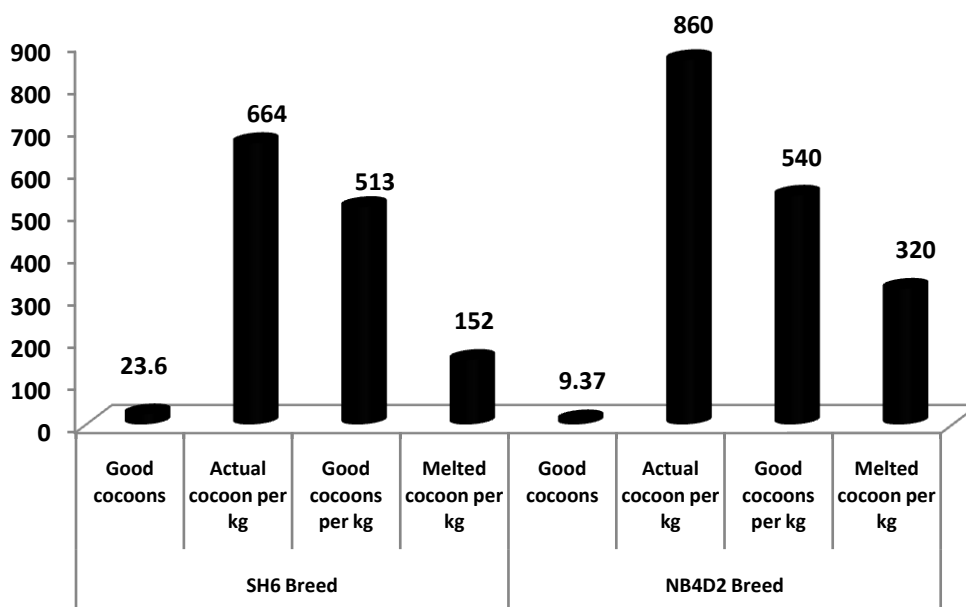


**Fig 3. Performance in Terms of Good Cocoons weight, actual cocoons per kg, good cocoon per kg and melted cocoons per kg.**

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