International Journal of Entomology Research
www.entomologyjournals.com
ISSN: 2455-4758
Received: 25-09-2023, Accepted: 11-10-2023, Published: 27-10-2023
Volume 8, Issue 10, 2023, Page No. 46-47

Influence of different mulberry varieties (V1, M_5 and S1635) on silkworm rearing and biological characters of Silkworm *Bombyx mori* L.

Rajendra S Bhalerao
Department of Zoology, I.C.S. College of Arts, Commerce and Science, Khed, Ratnagiri, Maharashtra, India

Abstract
This research was conducted to evaluate and compare the performance of the silkworm hybrid CSR2 X CSR4 reared with three varieties of mulberry leaves. In this study, the silkworms were fed with leaves from V1, M5 and S1635 trees and their influence on Fifth instar duration, larval, cocoon, shell and pupal weight, silk ratio, average filament length, filament weight and denier were examined. The results showed that silkworms that consumed leaves of V1 had better performance for traits of cocoon shell weight, feed efficiency to cocoon shell weight, and feed efficiency to cocoon weight than M5 and S1635 trees. Therefore, V1 tree is suggested for development of sericulture.

Keywords: Mulberry, silkworm, rearing, larva, cocoon, shell, pupa

Introduction
In the recent years much emphasis has been given to produce superior grade raw silk in view of the international market. Mulberry varieties differ widely with respect to their nutritional quality. The growth and development of silkworm larvae and economic character of cocoon are influenced largely by nutritional quality of mulberry used as food (Parpiev, 1968; Krishnaswami *et al.* 1970; Sighal, *et al*., 2006, Sunday A. Adeduntan, 2015) [1, 2, 7]. Evaluation of mulberry genotype for its quality through silkworm rearing is an important step in improvement programme. Evaluation through rearing test is most direct and efficient method. Therefore studies connected with the silkworm nutrition and evaluation of new mulberry variety under Marathwada condition.

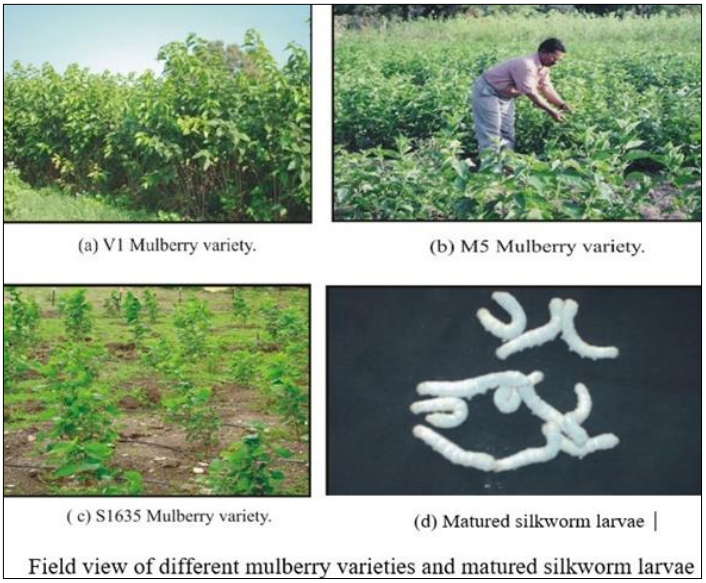
Material and methods
The experiment was conducted during post rainy (Aug.-Sept.) season of the year 2014-2015 and 2015-16.

Experimental details
A promising bivoltine x bivoltine mulberry silkworm hybrid CSR2 X CSR4 was used as test material

Design: Completely Randomized Design (CRD)
No. of replications: 3
Mulberry varieties used: V1 (Victory 1), M-5 (Kanva 2), S1635

A popular mulberry silkworm hybrid CSR2 x CSR4 was used for observing the influence of different mulberry varieties (V1 M5 and S1635) on silkworm rearing. The experiment was commenced from 5th instar as this is the stage in which the silkworm consumes more than 80 % of the total feed. After the 4th moult larvae were grouped into three groups of 100 healthy larvae, with three replicas and reared on V1, M5 and S1635 mulberry varieties separately during post rainy season (September) of the year.

Observations recorded
Observations on 5th instar larval duration, larval weight, cocoon weight, cocoon shell weight, pupal weight, shell ratio percentage, filament length, filament weight and denier of the filament were recorded.



Field view of different mulberry varieties and matured silkworm larvae

Result

Table 1: The results of performances and nutritional indices of the silkworm are presented in table-1.

Sr. No.	Mulberry varieties	Fifth instar larval duration (days)	Larval weight (g)	Single cocoon weight (g)	Cocoon shell weight (g)	Pupal weight (g)	Shell ratio percentage	Filament length (m)	Filament weight (g)	Filament denier
1	V1	6.562	3.662	1.812	0.395	1.416	21.793	1076.85	0.291	2.41
2	M5	6.843	3.271	1.718	0.346	1.371	20.169	978.35	0.281	2.591
3	S1635	6.666	3.465	1.759	0.369	1.389	20.999	1030.4	0.286	2.498
4	SE ±	0.0089	0.014	0. 008	0.001	0.007	0.009	10.328	0.002	0.002
5	CD at 5%	0.0266	0.043	0.024	0.005	0.02	0.027	30.64	0.007	0.007

Based on these results the influence of mulberry varieties (V1, M5 and SI635) on fifth instar duration indicated that fifth instar larval duration was significantly (0.0266) less in V1 (6.562 days) than M5 (6.843 days) and S1635 (6.666 days). It was observe that larval weight was significantly higher in V1 (0.043) than M5 and S1635. The difference between M5 and S1635 was also significant regarding larval weight. While single cocoon weight was also significantly (0.005) higher in V1 than rest of the mulberry variety.

Table 1 indicated that there was significant (0.02) pupal weight of silkworm fed with V1 than M5 and S1635. While there was no significant difference between silkworm pupal weights of silkworm fed with M5 and S1635. It was also indicated some trend with significantly (0.027) highest shell ratio percentage in V1 (21.793%) variety than M5 variety (20.168 %). Significantly more shell ratio percentage was also recorded on feeding of S1635 variety than M5.) It was also revealed same trend with significantly more filament length on feeding V1 (1076.85m) than M5 (978.35m) and S1635 (1030.40m). Among the feeding on M5 and S1635 varieties significantly (30.64) more filament length was recorded in S1635. There was no significant effect between varieties of mulberry leaves used during rearing of silkworm in respect to filament weight. Data (Table-1) also indicated with significantly (0.007) lowest and fine denier was recorded on feeding V1 variety than M5 and S1635. Significantly low and fine denier was also recorded on feeding S1635 variety than M5.

The different mulberry varieties have pronounced effect on the economical traits of silkworm and it is seen that, there overall V1 variety among all three V1, M5 and S1635 is providing better results.

Discussion

The hybrid CSR2 x CSR4 feeding on variety V1 exhibited superior performance in all characters *viz*. fifth instar larval duration (6.652 days), larval weight (3.662 g), single cocoon weight (1.812 g), shell weight (0.395g), shell ratio percentage (21.793 %), pupal weight (1.416 g), filament length (1076.85m), filament weight (0.291g) and denier of filament (2.410) over M5 and S1635 mulberry variety.

Whereas S1635, performed better in all economic traits over M5 verity except pupal weight (1.389g) and filament weight (0.286 g).

Superiority of V1 mulberry variety over M5 has been reported by Himantharaj, *et al*., (1994) [4]; Jalaja, *et al*., (1994), (1995) [6]; Satyanarayana, C.H., (2000); Subita, *et al*., (2001); Ravinder, S.G., (2006) [10], and Gawade, (2006) [11] present finding were supported by above worker. Superior performance of S1635 over M5 and other mulberry varieties also recorded by Naik, *et al*., (2003) [12] confirming present results.

Conclusion

From the study carried out on the influence of different mulberry varieties on the economic characters of silkworm race, it is concluded that, the variety V1 showed significant superiority over M5 and S1635 for all the observed characters.

References

1. Parpiev BA. Water metabolism of silkworm fed a different mulberry strain changing diet, Shlok.,1968:39:15-17.
2. Krishnaswami S, Noamani MK, Asain M. Studies on the quality of mulberry leaves and silkworm cocoon crop production part-I, quality differences due to varieties. Indian J. Seri.,1970:9(1):1-10.
3. Singhal BK, Dhar A, Khan MA. Leaf quality of mulberry (*Morus* sp.) under varying cultural cultural practices India sub-tropics. In: Porc. Of Regi. Semi. On "Prosects and Problems of Seri. an Economic enterprise in North West India", RSRS, Dehradun, India., 2006, 54-59.
4. Himantharaj MT, Meenal A, Pallavi SN, Kamble CK. Evaluation of mulberry genotypes under final yield trials. Annual Report 1993-94, Central Sericulture Research and Training Institute, Mysore, 1994, 84-85.
5. Jalaja SK, Sarkar A. Final yield evaluation of selected genotypes. Annual Report 1993-94, Central Sericultrual Research and Training Institute, Mysore, 1994, 20-21
6. Jalaja SK, Sarkar A. Evolution of superior mulberry genotypes. Annual Report 1994-95, Central Sericultrual Research and Training Institute, Mysore, 1995, 14-17.
7. Sunday A. Adenduntan, Influence of different varieties of mulberry leaves (*Morus alba*) on growth and cocoon performance of bivoltine strain of silkworm (*Bombyx mori*) Int. J. Biol. Chem. Sci,2015:9(2):751-757.
8. Satynarayana CH. Evaluation of V1 for leaf yield and rearing performance in transitional tract of north Karnataka. M. Sc. (Agri.) Thesis U.A.S., Dharwad., 2000.
9. Subitha MG, Magadum SB, Kamble CK, Narendra Kumar JB, Dandin SB. Evaluation of new mulberry variety for silkworm rearing at farmers level. In: Abstr. of Natl Semi. on Mulberry Seri. Research in India, KSSRDI, Bangalore, India, 2001, 105.
10. Ravinder, Rayar SG. Rearing performance of CSR breeds on improved mulberry varieties during summer season under Dharwad conditions. In: Abst. of Natl. Conf. on "New Strategies in Research and development of Sericulture- Indian Perspective" Dept. of Seri., Jananbharathi Campus, Bangalore, India, 9th-10th March, 2006, 79-80.
11. Gawade BV, Lanade UL, Bhute NK, Khan FS. Evaluation of some mulberry varieties in respect of cocoon weitht and cocoon filament length of silkworm *Bombyx mori* L. Indian J. Ent.,2006:70(3):282-283.
12. Naik MM, Patel MB, Radadia GG, Pastagia JJ. Effect of new mulberry varieties on silkworm rearing. In: Abst. of Natl. Conf. on Tropcial Seri. for Global Competitiveness, 5-7th Nov., 2003. CSR and TI, Mysore, India., 2003, 8.