The Pharma Innovation Journal 2022; SP-11(2): 1306-1308

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(2): 1306-1308

www.thepharmajournal.com
Received: 25-12-2021
Accepted: 27-01-2022

Sangle KV
Department of Agricultural Entomology, College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

CB Latpate
Department of Agricultural Entomology, College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

Matre YB
Department of Agricultural Entomology, College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

PY Ingole
Department of Agricultural Entomology, College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

Corresponding Author
Matre YB
Department of Agricultural Entomology, College of Agriculture, Vasantrao Naik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra, India

Performance of single and double hybrids of silkworm (*Bombyx mori* L.) for economic traits on mulberry

Sangle KV, CB Latpate, Matre YB and PY Ingole

Abstract
The experiment was carried out to study the "Performance of single and double hybrids of silkworm (*Bombyx mori* L.) for economic traits on Mulberry" at Sericulture Research Unit, Department of Agricultural Entomology, College of Agriculture, VNMKV, Parbhani during 2020 – 2021. The variety V-1 was utilized during experiment. The hybrids *viz*., BL67 x CSR5, SHP5 x DHP5, DHP5 x SHP5, (CSR16 x CSR17) x DHP5, (CSR2 x CSR40) x (S8 x CSR16), (CSR46 x CSR47) x (S8 x CSR16), (S8 x CSR16) x (CSR50 x CSR51) and (CSR2 x CSR4) x (G3 x G2) were utilized as treatments. The weight of cocoons was found to be in the range of 1.54 g to 1.92 g. The significantly highest cocoon weight was observed in (CSR_{16} x CSR_{17}) x DHP_5(1.92 g) over the rest of the hybrids, The maximum shell weight was recorded by the bivoltine hybrid (CSR_{16} x CSR_{17}) x DHP_5 (0.403 g). Among double hybrids, the two double hybrids (CSR_{46} x CSR_{47}) x (S_8 x CSR_{16}) (0.367 g) and (S_8 x CSR_{16}) x (CSR_{50} x CSR_{51}) (0.363 g) shown superior performance over the control treatment (CSR_2 x CSR_4) x (G_3 x G_2) (0.356 g). The bivoltine hybrid (CSR_{16} x CSR_{17}) x DHP_5 recorded highest filament length (1140 m) followed by the hybrid (CSR_2 x CSR_4) x (S_8 x CSR_{16}) (1096 m). Only two hybrids (S_8 x CSR_{16}) x (CSR_{50} x CSR_{51}) (783.33 m) andBL_{67} x CSR_5 (793.33 m) shown non-significant filament length values to control treatment (CSR_2 x CSR_4) x (G_3 x G_2) (840 m) and The filament weight was varied from 0.294 to 0.322 g and the highest filament weight of T_4 hybrid (CSR_{16} x CSR_{17}) x DHP_5 (0.322 g). The significantly lowest filament weight was observed inBL_{67} x CSR_5 (0.294 g) and (S_8 x CSR_{16}) x (CSR_{50} x CSR_{51}) (0.298 g).

Keywords: economic, hybrids, silkworm, mulberry, trait

Introduction
Silk is the world's most elegant textile, with unrivalled grandeur, natural sheen, and intrinsic affinity for colours, as well as great absorbency, light weight, soft touch, and high durability. It is referred regarded as the "Queen of Textiles" around the world. On the other hand, because of its high employment orientated, low capital intensive, and remunerative nature of production, it represents a livelihood option for millions. (Kumar *et al.*, 2017) [6].
India is one of the oldest country practicing sericulture and rearing of polyvoltine silkworm is tradition of the country. The majority of Indian silk is of polyvoltine origin, produced by small-scale operators who cannot compete in terms of quality and uniformity on the international market. As a result, there is a lot of room for increased production of high-quality silk to meet the needs of power looms, which will only be possible if bivoltine sericulture is successfully introduced on a broad scale, together with a modern reeling unit. It is consequently required to evolve bivoltine breeds that are suitable to farmers' situations, such as poor management levels, poor quality mulberry leaves, and variable microclimatic conditions (Quadri *et al*., 2013) [7]. In terms of productivity, one hectare of mulberry farming yields about Rs. 76,000 worth of silk, making it a highly profitable crop when compared to other commercial field crops. Additionally, it employs 12-13 people per year in mulberry cultivation, silkworm rearing, recycling, twisting, wearing, and garment production.

Material and Methods
The present investigation was undertaken to study the "Performance of Biological traits of single and double hybrids of silkworm (*Bombyx mori* L.) on Mulberry" at Sericulture Research Unit, Department of Agricultural Entomology, College of Agriculture, VNMKV, Parbhani during 2020–2021.
The rearing house and rearing appliances were disinfected with Sanitech (ClO_2) solution (500 ppm ClO2 + 0.5% slaked lime) to make them free from pathogens before rearing.

The trays containing egg sheets were stored in cool place in rearing house. On attaining the blue growth stage, the egg sheets were placed in plastic incubation tray and covered by black piece of cloth called as black boxing and left undisturbed for 24 hours for uniform growth of embryo, after which the eggs were exposed to bright tube light for one hour for uniform hatching. The newly hatched worms were given sliced fresh delicate mulberry leaves to eat of variety V-1. Timing of the feeding was fixed at 7 hours, 11 hours, 16 hours and 20 hours in a day. During its larval stage, the silkworm moults four times. (five instars).

After full development, the ripe worms were identified as they looked translucent with creamy colour and ceased to eat and crawled towards periphery of trays and tried to spin the cocoon, such worms were hand picked and kept on the mountages. Larvae spun the cocoons within 48 to 72 hours. The pupa remains inside the cocoon till emergence. The harvesting of cocoons was made on fifth day of release of worms from mountages.

Result and Discussion

Cocoon weight was recorded in the range of 1.54 g to 1.92 g. The significantly highest cocoon weight was observed in (CSR_{16} x CSR_{17}) x DHP_5(1.92 g) over the rest of the hybrids. The single hybrids BL_{67} x CSR_5 (1.54 g), SHP_5 x DHP_5 (1.67 g) and DHP_5 x SHP_5 (1.73 g) shown poor performance for the single cocoon weight. Vidhate (2013) [10] observed bivoltine hybrid CSR_{16} x CSR_{17}showed maximum single cocoon weight (1.98 g) and found significantly superior over rest of hybrids.

The maximum the bivoltine hybrid measured shell weight. (CSR_{16} x CSR_{17}) x DHP_5 (0.403 g). Among double hybrids, the two double hybrids (CSR_{46} x CSR_{47}) x (S_8 x CSR_{16}) (0.367 g) and (S_8 x CSR_{16}) x (CSR_{50} x CSR_{51}) (0.363 g) shown superior performance over the control treatment (CSR_2 x CSR_4) x (G_3 x G_2) (0.356 g). the hybrid BL_{67} x CSR_5 (0.318 g) shows lowest shell weight. Shinde (2010) [8] and Vidhate (2009) observed that hybrid CSR_{16} x CSR_{17} recorded maximum shell weight of (0.391 g) and (0.393 g) respectively over rest of hybrids.

The maximum shell percentage was recorded in (CSR_{16} x CSR_{17}) x DHP_5 (21.09 per cent) and minimum shell percentage was recorded in BL_{67} x CSR_5 (19.61 per cent) hybrid. Bobade (2019) [1] observed the shell ratio in hybrid CSR_{16} x CSR_{17}(24.17 per cent) which was maximum than other hybrids. Kumar (2003) [5] observed the shell ratio in DHP_5 921.8 per cent).

The bivoltine hybrid (CSR_{16} x CSR_{17}) x DHP_5 recorded highest filament length (1140 m) followed by the hybrid (CSR_2 x CSR_4) x (S_8 x CSR_{16}) (1096 m). Only two hybrids (S_8 x CSR_{16}) x (CSR_{50} x CSR_{51}) (783.33 m) andBL_{67} x CSR_5 (793.33 m) shown non-significant filament length values to control treatment (CSR_2 x CSR_4) x (G_3 x G_2) (840 m). Tekule (2018) [9] observed the filament length of hybrid DHP_5(987 m) and CSR_{16} x CSR_{17}(937.67 m) which was significant than other hybrids.

The filament weight was varied from 0.294 to 0.322 g. The highest filament weight of T_4 hybrid (CSR_{16} x CSR_{17}) x DHP_5 (0.322 g). The significantly lowest filament weight was observed inBL_{67} x CSR_5 (0.294 g) and (S_8 x CSR_{16}) x (CSR_{50} x CSR_{51}) (0.298 g). Bobade (2019) [1] recorded the highest filament weight of hybridCSR_{16} x CSR_{17} (0.331 g) and DHP_5 (0.261 g).

Table 1: Performance of single and double hybrids of silkworm (*Bombyx mori* L.) for Single cocoon weight, Single Shell weight, Shell ratio, Filament length and Filament weight.

Tr. No.	Treatments	Single cocoon weight (g)	Single Shell weight (g)	Shell ratio (%)	Filament length (m)	Filament weight (g)
T_1	BL67 x CSR5	1.54	0.318	19.61	793.33	0.294
T_2	SHP5 x DHP5	1.67	0.342	20.54	880.00	0.304
T_3	DHP5 x SHP5	1.73	0.347	20.13	933.33	0.316
T_4	(CSR16 x CSR17) x DHP5	1.92	0.403	21.09	1140.00	0.322
T_5	(CSR2 x CSR4) x (S8 x CSR16)	1.70	0.357	20.97	1096.00	0.318
T_6	(CSR46 x CSR47) x (S8 x CSR16)	1.79	0.367	20.57	980.00	0.309
T_7	(S8 x CSR16) x (CSR50 x CSR51	1.75	0.363	20.74	783.33	0.298
T_8	(CSR2) x CSR4) x (G3 x G2)(C)	1.89	0.356	18.82	840.00	0.303
	Mean	1.74	0.356	20.34	930.74	0.308
	SE(M)	0.029	0.004	0.353	25.004	0.002
	CD at 5%	0.090	0.013	1.082	76.577	0.005

Conclusion

These research finding concluded that among all the eight treatment used for rearing T_4 i.e. (CSR16 x CSR17) x DHP5 given the best results for economic traits. In aspect to better rearing of silkworm hybrids, (CSR16 x CSR17) x DHP5 was found to outperform over all treatments.

Acknowledgement

This study was made possible with the help of Sericulture Research Unit, Department of Agricultural Entomology, VNMKV, Parbhani for providing necessary facilities for the experiment and my guide for their support and guidelines in conducting the experiment.

References

1. Bobade BS, Latpate CB, Dake RB. Effect of feeding mulberry variety G-4 on economic traits of bivoltine silkworm (*Bombyx mori* L.) hybrids. Journal of Entomology and Zoology Studies. 2019;7(6):289-291.
2. Bongale U, Chaluvachari DM, Narhari BV. Mulberry leaf quality evaluation and it'simportance. Indian silk. 1991;39(8):51-53.
3. Veeranna G, Ashwath SK, Kalpana GV. Evaluation of the three-way cross bivoltine silkworm hybrids of Bombyx mori L. Indian Journal of Sericulture. 2011;50(2):119-123.
4. Ilyas M, Vidhate GS, Ugale TB, Kamate GS. Performance of Different Bivoltine Mulberry Silkworm Hybrids suitable for marathwada regions of India. Agricultural Science Digest. 2013;33(3):178-182.
5. Kumar NS, Basavaraja HK, Reddy NM, Dandin SB. Effect of high temperature and high humidity on the quantitative traits of parents, foundation crosses, single and double hybrids of bivoltine silkworm, Bombyx mori

L. International Journal of Industrial Entomology. 2003;6(2):197-202.
6. Kumar PBN, Umakanth RS. Economic parameters in selected silkworm races/breeds of *Bombyx mori* L. using two mulberry varieties. International Journal of Advanced Scientific Research. 2017;11(5):178-181.
7. Quadri SMH, Naseema Begum A, Mal Reddy N, Nirmal Kumar S. Studies on evaluation and selection of three way cross bivoltine silkworm hybrids of *Bombyx mori* L. for commercial exploitation. International Journal of Biological Science, 2013, 2249-9687.
8. Shinde S. Performance of promising mulberry silkworm (*Bombyx mori* L.) hybrids under Marathwada condition. M.sc (Agri.) Thesis, VNMKV, Parbhani (M.S), 2010.
9. Tekule AJ, Latpate CB, Somwanshi VL, Matre YB. Study on economic traits of bivoltine silkworm hybrids on V1 mulberry variety of *Morus alba*. International Journal of Chemical Studies. 2018;6(5):741-743.
10. Vidhate GS. Evaluation of bivoltine mulberry silkworm (*Bombyx mori* L.) hybrids under Marathwada condition. M.sc (Agri) Theses, VNMKV, Parbhani (M.S), 2009.