Biological Forum – An International Journal **15(8a): 262-266(2023)**

ISSN No. (Print): 0975-1130
ISSN No. (Online): 2249-3239

Evaluation of Bed Disinfectants on Economic Traits of Multivoltine Hybrid Mulberry Silkworm [NISTARI × (SK6×SK7)], in Kishanganj District, Bihar

Shriya Singh[1], Kalmesh Managanvi[2*], S.N. Ray[1] and Erayya[3]

[1]Department of Entomology, Bihar Agricultural College,
Bihar Agricultural University, Sabour, Bhagalpur (Bihar), India.
[2]Department of Entomology, Dr. Kalam Agricultural College,
Bihar Agricultural University, Sabour, Bhagalpur (Bihar), India.
[3]Department of Plant Pathology, Dr. Kalam Agricultural College,
Bihar Agricultural University, Sabour, Bhagalpur (Bihar), India.

(Corresponding author: Kalmesh Managanvi)*
(Received: 06 June 2023; Revised: 05 July 2023; Accepted: 18 July 2023; Published: 15 August 2023)
(Published by Research Trend)

ABSTRACT: The experiment was conducted to study the impact of four bed disinfectants on mulberry silkworm multivoltine hybrid mulberry silkworm [NISTARI × (SK6×SK7)] reared on C2038 variety in Kishanganj district of Bihar. Mulberry silkworm treated with bed disinfectant Labex@ 5g/sq. ft. ½ an hour before feeding showed significantly higher result in terms of single cocoon weight ((1.56 g), single shell weight (0.62 g), SR percentage (39.74 %), filament length (790.67 m), NBFL (790.67 m), denier (2.54), raw silk filament weight (0.23 g), renditta (4.57), in comparison to Vijetha, Sericillin and Amla powder while lower values were recorded in control batch.

Keywords: Bed disinfectants, multivoltine, post cocoon parameters.

INTRODUCTION

The word “Sericulture” refers to the conscious mass-scale rearing of silk producing organism in order to obtain silk from them or Sericulture is the art and science of producing silk. It deals with mulberry cultivation and raising silkworm larvae for industrial silk. Silk is a special protein fibre developed from the interface of plants and animals. The word "silk" is derived from" Si" the name of silkworm in Chinese. Silkworm is called as "Soi" in Korean and "Seize" in German. Silk is known as “QUEEN OF TEXTILE” and “BIOSTEEL because of its glistening shine, softness, elegance, durability, and tensile properties (Hiware, 2001). Sericulture is an important sub-sector of agriculture that contributes to the agricultural economy by providing year-round employment and better income, primarily to rural farm families (Roopa and Murthy 2015; Masrat and Tripathi 2017).

The mulberry silkworm (*Bombyx mori*) is a domesticated and economically significant insect that is the primary producer of silk. Because silkworms are more sensitive to environmental, nutritional, and microbial factors, they are more susceptible to disease, resulting in silkworm mortality and cocoon crop loss throughout the year (Doreswamy *et al*., 2004). In order to enhance silk production, it is essential to create mulberry varieties and silkworm breeds that exhibit high productivity and can withstand challenging climatic conditions and diseases (Jolly *et al.,* 1987). Unless appropriate curative or preventive measures are implemented during the rearing process, the existing infection could potentially lead to a rise in disease cases, resulting in significant crop losses. Unfortunately, no viable curative methods have been discovered to manage diseases in silkworms, making preventive measures the sole approach for disease control. As a standard preventive practice, the use of bed disinfectants is consistently employed in nearly all sericulture-adopting countries. Employing correct and efficient disinfection techniques and systematically maintain cleanliness protocols are crucial for achieving optimal outcomes. Various bed disinfectants *viz.,* Vijetha, sericilin, Labex and Amla were used and their effect on economical traits were observed on multivoltine mulberry silkworm

MATERIALS AND METHODS

The current experiment was created and carried out at the Advance Center on Sericulture, Kishanganj Bihar during March to June 2022. The multivoltine hybrid race [NISTARI × (SK6×SK7)] was utilised to examine the effect of bed disinfectants affected the commercial attributes and rearing efficiency which were then reared by adopting the usual approach until spinning.

Treatment details

T1 – Application of bed disinfectant Vijetha @ 5g/sq ft daily, after the bed cleaning before ½ an hour of feeding from 2nd moulting to before spinning.

T2 - Application of bed disinfectant Sericilin @ 5g/sq ft daily, after the bed cleaning before ½ an hour of feeding from 2nd moulting to before spinning.

T3 - Application of bed disinfectant Labex @ 5g/sq ft daily, after the bed cleaning before ½ an hour of feeding from 2nd moulting to before spinning.
T4 - Application of bed disinfectant Amla @ 5g/sq ft daily, after the bed cleaning before ½ an hour of feeding from 2nd moulting to before spinning
T5 – Untreated control

Rearing techniques: The experiment was conducted with completely randomized design with five treatments and four replications mulberry silkworm race namely multivoltine [NISTARI × (SK6× SK7)]. Fifty diseases free layings (DFL's) where selected and black boxing was done in egg racks covered with black sheets for hatching at room temperature in laboratory. It was observed that 90-95 per cent of hatching in both the races. After hatching of eggs tender mulberry leaves of variety C-2038 chopped into small pieces of 0.5 sq.cm size and sprinkled over newly hatched first instar larvae crawling over leaves and start eating at cutting edges.

Feeding of silkworm is done four times a day. The timing for feeding of silkworm were fixed at 6 AM, 11 AM, 4 PM and 10 PM for each day. In total four moulting were observed in silkworm during its growth phase. During each moulting silkworm stops feeding and rests with raising their head and change their colour. After 2nd moulting, 300 each 3rd instar larvae were taken as per treatments. There were four replications in each treatment, the larvae were separated in to different rearing tray as per there treatments and replications. Silkworm bed were made with uniform size as per there space requirement. Bed cleaning was done daily by removing waste material by hand picking method, after cleaning bed disinfectants were dusted with help of muslin cloths before ½ an hour of feeding. The quantity and size of leaves were increased after each moulting.

Full grown late instar larvae become sluggish and stop feeding, change their colour and become transparent, mature larvae become restless and raise their head and find support for spinning the cocoon. These larvae where hand-picked and shifted to Chandrika where it takes 6 to 10 days for spinning the cocoon. Worms were converting itself into pupae within cocoon in two to three days. Harvesting of cocoon was done on 7th day of spinning. After harvesting weight of 100 cocoon was taken and a lot of 50 green cocoon are separated for shell ratio and shell weight, after that green cocoon were oven dried at different temperatures from higher to lower as follows 110°C for fifteen-minute, 100°C for thirty-minute, 85°C for one hour, 70°C for two hour and 55°C for six hours. Later 150 grams of dried cocoon separated from each replication of treatment for further observing the post cocoon parameter.

Schedule of feeding: Chopped leaves of mulberry of variety C-2038 was fed to worms four times a day *viz*., 6 AM, 11AM, 4PM and 10 PM. For initial stage worm small size chopped leaves of 0.5mm is used to feed. After each moulting the size and quantity of feed is increases, for late-stage worm even whole leaves are given for feeding.

Schedule for bed disinfectants: Bed disinfectants was dusted on worm from 3rd instar till 5th instar on daily basis after bed cleaning and before ½ an hour of feeding with help of muslin cloths. Dose of dusting of bed disinfectants was @ 5g/sq ft.

Observations recorded

Single cocoon weight (gram): The weight of the cocoon was measured on the sixth day of spinning, when it is believed to be at its highest. The weight of a single cocoon was calculated as the average of 10 cocoons and it was measured in gram.

Single shell weight (gram): After extracting the pupae, the cocoons were split apart at one end, and the weight of the shell was recorded. The weight of a single shell was calculated as the average of 10 shells and it was measured in gram.

Cocoon shell ratio:

After deflossing and sorting, good green cocoons were collected randomly for assessment. For correct assessment, use of good electronic balance with a capacity to weigh 0.10 gm at lowest stage and maximum at 500-1000 g. The procedure followed was given below.

- Six or seven days after spinning, a cocoon examination was carried out.
- In order to avoid cutting the pupa while cutting cocoons, the cocoon must be cut obliquely.
- Separated ten male and ten female cocoons.
- All ten male cocoon shells with pupae should be placed on the balance after calibrating it for 0 to determine the cocoon weight.
- All ten male cocoon shells should be placed on the balance after calibrating it for 0 to determine the shell weight
- The same method was performed for female cocoons and readings were recorded.
- The shell ratio for male and female was calculated separately.
- Calculated the average cocoon weight, shell weight and shell ratio.

Sex	10 cocoon weight (gm)	10 shell weight (gm)
Male	A	B
Female	A1	B1
Average	C = A+A1/2	D = B+B1/2

Shell ratio is calculated by using the formulae;

$$\text{Shell ratio} = \frac{\text{Weight of cocoon shell (D)}}{\text{Weight of cocoon (C)}} \times 100$$

Filament length (m): Oven dried cocoon was cooked at 100°C after that reeling occur. By reeling 10 cocoons with the use of Epprovate, the average filament length of a cocoon was estimated in metres. Filament length is calculated by using formulae:

Filament length (m) = number of revolutions in Epprovate × 1.125

Non-breakable filament length (NBFL):

It is a standard length of cocoon filament that can be unwound without breaking. It is calculated by taking average of five cocoon filament. Formula for calculating NBFL is,

$$NBFL = \frac{\text{Filament length}}{1 + \text{Break}}$$ (Anonymous, 2005)

Denier: The term "denier" is used to describe the silk filament's thickness. It is defined as the weight of the filament divided by the length of the filament, multiplied by 9000. The average filament weight was recorded by taking the weight of randomly selected 10 reeled silk filaments. It is expressed in grams (g).

$$\text{Denier} = \frac{\text{Filament weight (g)}}{\text{Filament length (m)}} \times 9000$$

(Anonymous, 2005; Marks and Robinson, 1976)

Raw silk filament weight: It is the silk weight obtained after the reeling.

Renditta: Rendita is value derive from litre of cocoon required to produce 1 kg of silk. Calculated by using formula;

$$\text{Rendita} = \frac{\text{Good green cocoon weight}}{\text{Silk weight}}$$

RESULT AND DISCUSSION

Effect of different bed disinfectants on in multivoltine Single cocoon weight hybrid race [NISTARI × (SK6×SK7)] of mulberry silkworm. In multivoltine race (Table-1) the result showed that significantly maximum single cocoon weight (1.56 g) was observed in treatment T3 *i.e.*, application of bed disinfectants Labex @ 5g/sq. ft. ½ an hour before feeding followed by treatment T4 *i.e*., application of bed disinfectants Amla @ 5g/sq. ft. (1.54 g). The significantly lowest single cocoon weight was observed in untreated control (1.40 g). The present findings are in accorded with earlier findings of Manimegalai *et al.* (1999) found the Vijetha treatment recorded maximum single cocoon weight (1.63 g). Anonymous (2002) also shown that Vijetha has recorded maximum single cocoon weight (1.684 g) as compare to other disinfectants. Swathi *et al.* (2014) observed the cocoon weight 1.96 g was maximum in daily application of hydrated lime powder at the rate of 5g/sq ft + application of bundh powder after every moult. Kuntamalla *et al.* (2007); Singh (2012); Chitra *et al.* (1975) also reported increase in cocoon to untreated control. Surapwar (2019) revealed that the highest single cocoon weight (1.94 g) was recorded in treatment T1 *i.e.*, application of bed disinfectant Vijetha at the rate 5g per sq.ft. ½ hour before resuming feeding after each moulting.

Effect of different bed disinfectants on in multivoltine Single shell weight hybrid race [NISTARI × (SK6×SK7)] of mulberry silkworm. In multivoltine race (Table 1) the result showed that significantly maximum single shell weight (0.62 g) was observed in treatment T3 *i.e.*, application of bed disinfectants Labex @ 5g/sq. ft. ½ an hour before feeding followed by treatment T4 *i.e*., application of bed disinfectants Amla @ 5g/sq. ft. (0.59 g). The significantly lowest single shell weight was observed in untreated control (0.47 g). The present results are in agreement with the earlier results of (Anonymous (2002) noticed that Vijetha recorded maximum single shell weight (0.285 g) as compare to other disinfectants. Swathi *et al.* (2014) noticed the shell weight (0.330 g) was highest in daily application of hydrated lime powder after every moult. Shashidhar *et al.* (2018) found that effectiveness of bed disinfectants on silkworm diseases application of Ankush, Vijetha green and slaked lime powder combination bed disinfectant was recorded high shell weight (0.340 g).

Effect of different bed disinfectants on cocoon shell ratio in multivoltine hybrid race [NISTARI × (SK6×SK7)] of mulberry silkworm. In multivoltine race (Table 1) the result showed that significantly maximum cocoon shell ratio (39.74 %) was observed in treatment T3 *i.e.*, application of bed disinfectants Labex @ 5g/sq. ft. ½ an hour before feeding followed by treatment T4 *i.e*., application of bed disinfectants Amla @ 5g/sq. ft. (38.48 %). The significantly lowest cocoon shell ratio was observed in untreated control (33.66 %). Present findings are in line with the findings of Surapwar *et al.* (2019) found bed disinfectant of Vijetha @ 5g/sq ft. recorded highest cocoon shell ratio compared to control treatment. Karuppasamy *et al.* (2013) and Chitra *et al.* (1975) found higher values of shell ratio in use of bed disinfectants as compared to control. Jadhav and Salunke (1995) reported the highest shell percentage of mulberry silkworm bed which was disinfected by the application of lime+ paraformaldehyde (98:2). Baig *et al.* (1993); Sivaprakasam (1999); Jawale and Tayade (1987); Jadhav and Salunke (1995) also found the similar results by using different bed disinfectant.

Effect of different bed disinfectants on filament length of multivoltine hybrid race [NISTARI × (SK6×SK7)] of mulberry silkworm. In multivoltine race the result showed that significantly maximum filament length (790.67 m) was observed in treatment T3 *i.e.*, application of bed disinfectants Labex @ 5g/sq. ft. ½ an hour before feeding followed by treatment T4 *i.e*., application of bed disinfectants Amla @ 5g/sq. ft. (785.67 m). The significantly lowest filament length was observed in untreated control (698 m). Jawale and Tayade (1987) studied that highest filament length in paraformaldehyde. Jagannatha (1996) reported significantly higher filament length in application of formalin chaff and lime + Dithane M application. Manimegalai and Subramaniam (1999); Anonymous (2002); Kuntamalla (2007); Swathi *et al.* (2014); Shashidhar *et al.* (2018) were also seems have the results in line with filament length of present study.

Effect of different bed disinfectants on Non-breakable filament length of multivoltine hybrid race [NISTARI × (SK6×SK7)] of mulberry silkworm. In multivoltine race the result showed that significantly maximum non-breakable filament length (790.67 m) was observed in treatment T3 *i.e.*, application of bed disinfectants Labex @ 5g/sq. ft. ½ an hour before feeding followed by treatment T4 *i.e*., application of bed disinfectants Amla @ 5g/sq. ft. (785.67 m). The significantly minimum non-breakable filament length was observed in untreated control (595.05 m). The present study is in agreement with earlier results of Jawale and Tayade (1987) studied that

highest non-breakable filament length in paraformaldehyde. Jagannatha (1996) reported significantly higher non-breakable filament length in application of formalin chaff and lime + Dithane M application. Manimegalai and Subramaniam (1999); Anonymous (2002); Kuntamalla (2007); Swathi *et al.* (2014); Shashidhar *et al.* (2018) were also seems have the results in line with non-breakable filament length of present study.

Effect of different bed disinfectants on denier of multivoltine hybrid race [NISTARI × (SK6×SK7)] of mulberry silkworm. In multivoltine race the result showed that significantly minimum denier (2.54) was observed in treatment T3 *i.e.,* application of bed disinfectants Labex @ 5g/sq. ft. ½ an hour before feeding followed by treatment T4 *i.e*., application of bed disinfectants Amla @ 5g/sq. ft. (2.59). The significantly minimum denier was observed in untreated control (2.91). The present results are in agreement with Gowda (2014) with recommended dosage of bed disinfectants denier were better in the 100 per cent bed disinfectant or recommended bed disinfectant was used.

Effect of different bed disinfectants on Raw silk filament weight of multivoltine hybrid race [NISTARI × (SK6×SK7)] of mulberry silkworm. In multivoltine race (the result showed that significantly minimum raw silk filament weight (0.23 g) was observed in treatment T3 *i.e.,* application of bed disinfectants Labex @ 5g/sq. ft. ½ an hour before feeding followed by treatment T4 *i.e*., application of bed disinfectants Amla @ 5g/sq. ft. (0.25 g). The significantly minimum raw silk filament weight was observed in untreated control (0.35 g).

The study on the effect of disinfectants Vijetha and Labex used in the present investigation on raw silk percentage of bivoltine and multivoltine silkworm races has not been attempted by any one till date.

Effect of different bed disinfectants on Renditta of multivoltine hybrid race [NISTARI × (SK6×SK7)] of mulberry silkworm. In multivoltine race the result showed that significantly lowest renditta (4.57) was observed in treatment T3 *i.e.,* application of bed disinfectants Labex @ 5g/sq. ft. ½ an hour before feeding followed by treatment T4 *i.e*., application of bed disinfectants Amla @ 5g/sq. ft. (4.64). The significantly higher renditta was observed in untreated control (4.95).

The study on the effect of disinfectants Vijetha and Labex used in the present investigation on renditta of bivoltine and multivoltine silkworm races has not been attempted by any one till date.

Table 1: Effect of different bed disinfectants on post cocoon parameters of multivoltine silkworm race [NISTARI × (SK6 × SK7)].

Treatments	Single cocoon weight (g)	Single Shell Weight (g)	SR (%)	Filament length (m)	NBFL (m)	Denier	Raw Silk filament Weight (g)	Renditta
T1- Vijetha	1.46	0.50	36.02 (34.59*)	708.00	647.30	2.79	0.32	4.81
T2- Sericilin	1.50	0.54	36.76 (35.82)	721.33	721.34	2.65	0.30	4.74
T3- Labex	1.56	0.62	39.08 (39.74)	790.67	790.67	2.54	0.23	4.57
T4- Amla	1.54	0.59	38.34 (38.48)	785.67	785.67	2.59	0.25	4.64
T5- Control	1.40	0.47	35.46 (33.66)	698.00	595.05	2.91	0.35	4.95
SE(±m)	**0.01**	**0.01**	**0.81**	**6.69**	**15.3**	**0.02**	**0.01**	**0.03**
CD at 5%	**0.04**	**0.04**	**2.43**	**20.17**	**46.0**	**0.07**	**0.03**	**0.09**
CV%	**1.67**	**4.55**	**9.08**	**1.81**	**4.3**	**1.73**	**7.90**	**1.31**

CONCLUSIONS

The success of sericulture industry depends upon several factors of which the impact of the environmental factors such as biotic and abiotic factors is of vital importance (Gautam *et al.,* 2022). Among the abiotic factors, temperature plays a major role on growth and productivity of silkworm, as it is a poikilothermic (cold blooded) insect Benchamin and Jolly (1986). Mulberry silkworm treated with bed disinfectant Labex @ 5g/sq. ft. ½ an hour before feeding showed significantly higher result in terms of single cocoon weight, single shell weight, SR percentage, filament length, NBFL, denier, raw silk filament weight, renditta in comparison to Vijetha, Sericillin and Amla. So, it is recommended to follow the disinfection by Labex for better post cocoon parameters in Bihar and eastern part of India.

FUTURE SCOPE

The farmers of Northern India, especially Bihar in particular are not much aware of sericulture, its benefits, diseases and other activities related to sericulture except some packets of Kishanganj, Purnea, Kathihar, Arraria Banka and Jamuai districts. It needs to be spread to other districts for accomplishment national and state targets. The diseases play a very key role in getting good results. So, good quality bed disinfectants are very essential for same. The present study will be very helpful in addressing the needs of farmers in the eastern region of country.

Acknowledgements. Authors are thankful to Director and scientific staff of Central Sericultural Research and Training Institute, Berhampore West Bengal for encouragement and support during post cocoon parameters analysis of the study.
Conflict of Interest. None.

REFERENCES

Anonymous (1979). Effect of pretreatment of mulberry leaves on larval health cocoon crop and incidence loss due to disease. *Annual Report, C.S.R. and T.I., Mysore*, 58-59.

Anonymous (1980). Effect of pretreatment of mulberry leaves on larva health cocoon crop and incidence loss due to disease. *Annual Report, C.S.R. and T.I., Mysore*, 65-66.

Anonymous (2002). *Economic survey of Maharashtra*, 2001-2002.

Baig, M. (1993). Efficacy of certain disinfectants in different combination against the nuclear polyhedrosis and white muscardine of the silkworm *B. mori* L. *Sericologia*, ***33***:53-60.

Banuprakash, K. G., Govindan, R. and Devaiah M. C. (2001). *In vivo* efficacy of some chemicals on the growth and development of mulberry silkworm, *Bombyx mori* L. *Bulletin of Indian Academy of Sericulture, 5 (1):* 68-74.

Benchamin, K. V. and Jolly, M. S. (1986). Principles of silkworm rearing, in Proceedings of Seminar on Problems and Prospects of Sericulture, S. Mahalingam, Ed., pp. 63-106, Vellore, India.

Chitra, C., Karanth, N. G. K. and Vasanthrajan, V. N. (1975). Disease of mulberry silkworm, *Bombyx mori* L. *J. Sci. Ind Res., 34*, 386-401.

Doreswamy, C., Govindan, R., Devaiah, M. C. and Muniswamappa, M. V. (2004). Deterioration of cocoon traits of silkworm, *Bombyx mori* L. by the synergistic infection with larval flacherie pathogens. *Karnataka Journal of Agricultural Sciences, 17*, 345-348.

Gautam, M.P., Singh, D.K., Singh, S.N., Singh, S.P., Manoj Kumar and Shailendra Singh (2022). A Review on Silkworm (*Bombyx mori* Linn.) An Economic Important Insect. *Biological Forum – An International Journal, 14*(4a), 482-491.

Geetha, G.S., Srinivasa and Vijaya Prakash, N.B. (2005). Comparative performance of CSR hybrids and traditional cross breed a study in Mysore and Mandya districts of Karnataka. *Indian Journal of Sericulture, 44*(1), 13-17.

Hiware, C. J. (2001). Agro Cottage Industry Sericulture. *Daya Publishing house, Delhi* India, 57-93.

Jadhav, R. M. (1990). Effect of different bed disinfectants for the control of silkworm (*Bombyx mori* L.) Disease with special reference to grasserie. *M.Sc. (Agri.) Thesis, submitted to MAU, parbhani.*

Jadhav, S. B and Salunke, R. T. (1995). Efficacy of some bed disinfectants on the grasserie disease in silkworm, *Bombyx mori* L. *Cur. Agric. Research, 8*(1), 16-20.

Jagannatha, K. R. (1996). Evaluation of commercial germicides for their utility as disinfectants in silkworm rearing. *M.S.c (Agri) Thesis, UAS, Bangalore*, 136.

Jawale, M. D. and Tayade, D. S. (1987). Effect of certain bed disinfectants on the growth and disease control of silkworm (*Bombyx mori* L). *Sericologia, 27*(23), 443-446.

Jolly, M. S, Ullal, S. R. and Narasimhanna. (1987). Appropriate sericulture technique. Hand Book of Practical Sericulture. *Journal of Experimental Zoology*, *7*(1), 165-168.

Karthikairaj, K., Sureshkumar P. and Isaiarasu, L. (2013). Influence of turmeric extract on the growth and commercial parameters of *Bombyx mori* L. *African Journal of Basic and Applied Sciences, 5*(5), 228-231.

Manimegalai, S. and Subramaniam, A. (1999). Efficacy of bed disinfectants and botanicals against Grasserie disease of silkworm *Bombyx mori* L. *Proceeding of NSTS*, 338-340.

Masrat, S. and Tripathi, A. K. (2017). Sericulture Industry in India A comparative study of Jammu and Kashmir and Madhya Pradesh. *International Journal of Business and Administration Research Review, 1(*18), 81.

Narasimhanna, M. N., Samson, M. N. and Baig, M. (1975). The control of white muscardine disease of silkworm *Ann. Rep. C.S.R. and T.I., Mysore*, 106-111.

Roopa, H. and Murthy, C. (2015). Trends in arrivals and prices of cocoons in Shirahatti market at Haveri district. *International Journal of Commerce and Business Management, 8*(1), 131-134.

Samson, M. V. (1986). Effect of some fungicide and disinfectants for the control white muscardine disease in mulberry silkworm. *Indian J. Seric, 25*, 77-78.

Shankar Rao, K. V. and Giridhar, K. (2000). Assessment of factors influencing the productivity of commercial mulberry silkworm rearing at farmer's level. *Bulletin of Indian Academy of Sericulture, 4*(2), 1-9.

Sharma, B. J., Samson, M. V., Balavenkatasubbaiah, M. and Datta, R. J. L. (1994). Effect of different disinfectants on the prevention of NPV of silkworm *Bombyx mori* L. *Sericologia, 34* (2),100- 104.

Shashidhar, K. R., Thulasiram, K. and Noorulla, H. (2018). Effectiveness of bed disinfectants on silkworm diseases and cocoon yield under tropical conditions of Kolar district, Karnataka, *Journal of Pharmacognosy and Phytochemistry, 7*(5), 272

Singh, A. (2012). Effect of two different bed disinfectants on cocoon productive in spring rearing of Silkworm, *Bombyx mori* L. *Green farming*, *3*(1), 123-124.

Singh, K. N., Sidhu, N. S. and Datta, R. K. (2000). Continuous use of Formalin chaff had adverse effect on larval growth and cocoon character at higher temperature. *Indian Silk, 20*(11), 28-31.

Singhavi, N. R., Kushwaha, R. V., Mathur, S. K., Lochan, R., Rekha, M. and Sinha, B. R. (2004). Comparative efficacy of bed disinfectants TKO, Resham Jyothi and Vijetha and protecting tasar silkworm from invasion of pathogen.

Sivaprakasam, N. (1999). Botanical formulation for management of Grasserie disease of silkworm *B. mori* L. silkworm management in Tropics. *Deparment of Sericuture, University of Agricultural Sciences GKVK. Banglore*, 13.

Sujatha, K., Rao, A. P. and Ch, Sammaiah. (2007). Bio efficacy of *Curcuma longa* as bed disinfectant on biological parameters in silkworm *Bombyx mori* L. (Lepidoptera: Bombycidae). *The Asian Journal of Animal Science*, *2*(1), 80-83.

Surapwar, P. H., Nalwandikar, P. K., Bhamare, V. K. and Waghmare, Y. M. (2019). Effect of different bed disinfectants on economic traits of double hybrid mulberry silkworm (*Bombyx mori* L.). *IJCS*, *7*(5), 1855-1858.

Swathi, H. C., Vijayendra, M. and Nagaraj, S. B. (2014). Revalidation of bed disinfectant practices followed by farmers in the rearing of silkworm *Bombyx mori* L. *IOSR journal of agriculture and veterinary science, 7*(1), 1-7.

How to cite this article: Shriya Singh, Kalmesh Managanvi, S.N. Ray and Erayya (2023). Evaluation of Bed Disinfectants on Economic Traits of Multivoltine Hybrid Mulberry Silkworm [NISTARI × (SK6×SK7)], in Kishanganj District, Bihar. *Biological Forum – An International Journal, 15*(8a): 262-266.