



Role of Bed Disinfectants in *Bombyx mori* L. for Better Cocoon Crop Production

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The silkworm, *Bombyx mori* is susceptible to various disease-causing pathogens which causes heavy losses to silkworm farmers in the form of reduced cocoon yield. The silkworm diseases cannot be controlled but can only be prevented to curb the secondary contamination in the rearing bed. The use of different bed disinfectants in recommended schedule against disease causing pathogens acquires importance for the healthy growth of larva and quality cocoon production thereby helping in socioeconomic development of silkworm farmers.

Keywords: Disease, Grasserie, Bed disinfectant, Sericillin

Introduction

The silkworm, *B. mori* domesticated for long time has lost many characters and became susceptible to various diseases. Its growth and development are badly impacted by the fluctuations in temperature and relative humidity in the rearing room which makes it more prone for the outbreak of diseases. The diseases namely Pebrine, Grasserie, Flacherie and Muscardine cause substantial damage to silkworm larva as 15-20 kg/100 dfls, about 30% loss is caused by these diseases (Selvakumar *et al.*, 2002). During silkworm rearing, *B. mori* gets infected with various disease-causing organisms through contaminated leaves and other sources of contamination. Through proper disinfection and hygiene methods the growth of pathogens can be checked from spreading and multiplication to other healthy larvae (Baig *et al.*, 1990, 1993; Doreswamy *et al.*, 2004). The use of bed disinfectants is practiced as it prevents the secondary contamination in the rearing bed and helps in smooth conducting of silkworm rearing and harvesting of good quality cocoon crop.

Bed disinfectants in use for silkworm rearing

The rearing bed disinfectants are the substances which kills the germs during the silkworm rearing and prevents its spread and multiplication and ensures the proper hygiene of the rearing bed. The secondary contamination and spread of the diseases to silkworms in rearing bed is significantly avoided by the application of bed disinfectants as per the recommended schedule. The slaked lime powder which is applied at the start of each moult is an effective against the viral infections by absorbing the extra moisture thereby regulating the humidity in the rearing bed. In general, the silkworm body and rearing seat disinfectants are found to have antiviral, antifungal, antibacterial, and antimicrosporidian activity which makes sure that the rearing area remains pathogen free. The different kinds of rearing disinfectants which are currently in use and proving to be effective for preventing the silkworm diseases are: (a)

Vijetha- It is the first powder formulation body and rearing bed disinfectant developed by Central Silk Board effective against all silkworm pathogens in 1996 against silkworm diseases. It has a shelf life of one year, cost effective and can be used in all the seasons throughout the year (Anonymous., 2022g). (b) Reshom Keet Oushadh (RKO)- This first silkworm body and rearing bed disinfectant was developed by CSRTI, Mysore in 1986. It is effective against grasserie and muscardine disease in young and late age silkworms (Anonymous., 2022b) having shelf life of six months. The ingredients of RKO are slaked lime powder, captan/diathane, benzoic powder and formaldehyde (Subbarao *et al.*, 1992). (c) Slaked lime- This colourless crystal/white powder is an effective disinfectant widely used in silkworm rearing being cheap and effective against all the silkworm diseases (Lakshmanan *et al.*, 2010) especially during rainy season with very high temperature. (d) Formalin chaff- This is an effective disinfectant used against viral, bacterial and fungal diseases occurring during silkworm rearing (Shankar, 2003) containing 1 part of formalin and 10 parts of Paddy husk. (e) Sanjeevini- This season specific bed disinfectant is developed by KSSRDI (1990) against silkworm diseases (grasserie and flacherie) during summer and rainy seasons having shelf life of six months (Subbarao *et al.*, 1992; Anonymous., 2022d). (f) Ankush- It is an eco-friendly botanical based disinfectant developed by CSRTI, Mysore in 2000 containing non-hazardous chemicals in definite proportions. This disinfectant is effective against pebrine, muscardine, grasserie and flacherie disease having shelf life of one year (Sharma *et al.*, 2008). (g) Labex- It is developed by CSRTI, Berhampore (2005), made up of two locally available chemicals (97% slaked lime + 3% bleaching powder) and is highly effective against grasserie and muscardine disease (Anonymous., 2022h). (h) Sericillin- This disinfectant is developed by CSRTI, Berhampore (2013) and is cost-effective made up of three chemicals namely lime, bleaching powder and fungicide. It is mainly used against muscardine and aspergillosis disease of silkworm (Chakrabarty *et al.*, 2013). (i) Resham Jyothi- This wide spectrum bed disinfectant is developed by Silkworm Seed Technology Laboratory (SSTL), CSB, Kodathi, Bangalore against grasserie, infectious flacherie, bacterial flacherie, pebrine and muscardine disease (Anonymous., 2022e). (j) Suraksha- This chemical-based season specific bed disinfectant, developed by KSSRDI (1990) is effective against fungal diseases especially white muscardine. It is recommended during winter and rainy seasons with a shelf life of six months (Anonymous., 2022d). (k) Reshme Aishwarya- It is a chemical-based bed disinfectant developed by the collaboration of KSSRDI and M/S Santhosh enterprises Pvt Ltd. Bangalore in 2006. It is effective against all the diseases being economical, easy to use and suitable for the farmers socio economic conditions (Anonymous., 2022d). (l) Musgard- This is a season specific powdered bed disinfectant developed by KSSRDI (2006) against the fungal diseases during winter and rainy seasons with a shelf life of six months. (Anonymous., 2022d). (m) Samrakshak- It is a chemical-based bed disinfectant developed by KSSRDI (2011) and is highly effective against, pebrine, grasserie, flacherie, muscardine and aspergillosis diseases of silkworm (Anonymous., 2022d).

Precautions to be taken during bed disinfectant use

The use of bed disinfectants in recommended schedule may enhance production (24 to 40%) helps in additional income for farmers. During the dusting of bed disinfectants new/clean muslin cloth should be used. The rearing bed should be free from fresh mulberry leaves during dusting. At the time of dusting the nose and ears should be protected by mask. During noticing of any diseased larva, it needs to be screened for checking the pathogens. For ensuring proper efficacy about 2-5 grams of disinfectants/sq feet of rearing bed is applied. The disinfectants are mostly effective for a period of 6 months-1 year and its expiry date should be checked before its proper use. After use of bed infectants the containers should be

properly disposed of by burning or placed in deep soil (Balavenkatasubbaiah *et al.*, 1989; Sharma, 2006).

Preventive measures for the overall management of silkworm diseases

The rearing house, its surroundings, appliances should be disinfected two times with recommended disinfectants *viz.*, Sanitech, Asthra etc. The personal and rearing hygiene during rearing should be maintained. The DFLs should be selected with proper care. The infected larvae should be isolated and properly disposed at early stages to prevent further contamination. The maintenance of optimum temperature and humidity, proper ventilation must be ensured. The use of disinfectants *viz.*, Vijetha, RKO etc. as per recommended schedule must be followed to kill the germs in the rearing bed.

Conclusion

During silkworm rearing the larvae face many life-threatening diseases which impacts their growth and development and incur huge losses to farmers in the form of poor cocoon harvest. In order to get quality cocoon production, the rearing must be conducted as per standard protocol and proper hygiene and disinfection should be ensured from time to time. The use of various recommended bed disinfectants should be followed properly for ensuring the pathogen free growth of larva to boost the total cocoon production in the rearing season.

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