



Effect of Disinfectants on white Muscardine Disease in Silkworm *Bombyx mori* L.

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ABSTRACT

Disinfectant treatments were found to be superior to untreated check in improving per cent survival. Among the disinfectants used 2% formalin was most effective in preventing the white muscardine disease and the larval and cocoon parameters obtained were also maximum.

Key words : Disinfectant, Silkworm, White muscardine disease.

White muscardine disease caused by *Beauveria bassiana* (Bals) Vuill. of silkworm *Bombyx mori* L. is more prevalent during winter season. The problems of the diseases have been overcome largely by concentrating on prevention rather than controlling them after the disease have broken out. With a view to search for an effective disinfectant, a few disinfectants have been tested.

MATERIAL AND METHODS

To know the effectiveness of different disinfectants, the round bamboo rearing trays were first sprayed with fixed load of inoculum (10^5 spores ml^{-1}). After four days, the trays were separately disinfected with one and two per cent formalin, bleaching powder and potassium permanganate ($KMnO_4$). For each treatment three replications were maintained with 20 larvae for each treatment. Trays sprayed with fungal spores without disinfection were kept as control and trays sprayed with fungal spores and disinfected with Reshamkeetoushad (RKO) was also kept as another control. After disinfection, fifth instar larvae of PM x NB₄D₂ race was released into trays for rearing. Observations were recorded on the extent of larval and pupal mortality, larval, cocoon and shell weights.

RESULTS AND DISCUSSION

Effect of disinfectant treatments given to silkworm rearing trays on mortality, larval weight and cocoon parameters among surviving population of silkworm *B. mori* L was presented in the Table 1. All the disinfectants were significantly superior over control.

Larval mortality.

Minimum larval mortality of silkworm, *Bombyx mori* larvae was 6.50 per cent which was recorded when the contaminated rearing trays were disinfected with two per cent formalin which was on par with RKO (8.20%). The next best disinfectant was one per cent formalin which recorded 11.60 per cent larval mortality followed by two per cent $KMnO_4$ (15.00%), one per cent $KMnO_4$ (16.60%) and two per cent bleaching powder being on par with one another. The least effective among these disinfectants was one per cent bleaching powder which showed 23.33 per cent larval mortality and it was found significantly superior over control where 86.80 per cent larval mortality was recorded

Pupal mortality

Minimum pupal mortality of 2.50 per cent was recorded when the contaminated trays were disinfected with two per cent formalin which was on par with RKO treatment (3.60%) and one per cent formalin (5.70%). The next best disinfectant was two per cent $KMnO_4$ which recorded 17.60 per cent pupal mortality followed by one percent $KMnO_4$ (19.90%), two percent bleaching powder (22.40%) and one per cent bleaching powder (30.50%) which were on par with one another. All the disinfectants were significantly superior over control where 84.10 per cent pupal mortality was recorded.

Total mortality (larval and pupal mortality)

The total mortality was minimum (8.20%) when two per cent formalin was used as disinfectant which was on par with RKO (10.90%). One per cent formalin was the next best treatment which recorded 16.60 per cent total mortality followed by two per cent $KMnO_4$ (30.00%), one per cent $KMnO_4$ (33.33%) and two per cent bleaching powder (36.60%) which

Table 1: Effect of different disinfectants given to silkworm rearing trays on mortality, larval weight and cocoon parameters.

Treatments	Larval mortality (%)	Pupal mortality (%)	Total mortality (larval and pupal) (%)	Larval weight (g)	Cocoon weight (g)	Pupal weight (g)	Shell weight (g)	Shell percentage (%)
Formalin-1%	11.60 (19.89)b	5.7 (13.81)a	16.60 (24.05)b	3.30c	1.53e	1.29e	0.24d	15.80 (23.39)a
Formalin-2%	6.50 (14.76)a	2.50 (9.00)a	8.20 (16.60)a	3.51a	1.79a	1.51a	0.29a	16.30 (23.76)a
Bleaching powder-1%	23.33 (28.85)d	30.50 (33.49)b	46.60 (43.07)d	2.89g	1.49g	1.28f	0.21f	14.40 (22.27)b
Bleaching powder-2%	18.33 (25.30)c	22.40 (28.26)b	36.60 (37.22)c	2.96f	1.51f	1.29e	0.22e	14.60 (22.46)b
KMnO ₄ -1%	16.60 (24.05)c	19.90 (26.53)b	33.33 (35.22)c	3.03e	1.61d	1.37d	0.24d	14.90 (22.66)b
KMnO ₄ -2%	15.00 (22.79)c	17.60 (24.80)b	30.00 (33.21)c	3.12d	1.64c	1.38c	0.25c	15.00 (22.79)b
RKO (Reshamkeet oushad)	8.20 (16.60)a	3.60 (10.92)a	10.90 (19.30)a	3.38b	1.65b	1.39b	0.26b	16.10 (23.63)a
Control	86.80 (68.66)e	84.10 (66.50)c	97.80 (81.39)e	1.04h	1.02h	0.93g	0.09g	9.00 (17.41)c
CV	8.88	33.70	12.06	0.44	1.41	1.35	4.70	2.23
CD at 0.05%	2.628	9.636	4.744	0.014	0.014	0.019	0.011	0.534

were on par with one another. One per cent bleaching powder treatment was the least effective among these disinfectants which recorded 46.60 per cent total mortality but was significantly superior over control where 97.80 per cent total mortality was recorded.

Larval weight

The results on larval weight showed significant difference among treatments which were significantly superior over control. The best treatment was two per cent formalin which recorded highest larval weight of 3.51g. The next best treatment was RKO which recorded 3.38g of larval weight followed by one per cent formalin (3.30g), two per cent KMnO_4 (3.12g), one per cent KMnO_4 (3.03g) and two per cent bleaching powder (2.96g). The least effective treatment was one per cent bleaching powder which recorded 2.89 g of larval weight and it was found significantly superior than the control which recorded 1.04 g of weight of silkworm larvae.

Cocoon weight

Maximum cocoon weight of 1.79 g was recorded with two per cent formalin treatment. The next best treatment was RKO which recorded 1.65g of cocoon weight followed by two per cent KMnO_4 (1.65g), one per cent KMnO_4 (1.64g), one per cent formalin (1.53g) and two per cent bleaching powder (1.51g) treatment. One per cent bleaching powder treatment was the least effective disinfectant which recorded 1.49g of cocoon weight and significantly superior over control (1.02g).

Pupal weight

Two per cent formalin was most effective disinfectant which recorded 1.51 g of pupal weight. The next best treatment was RKO which recorded 1.39g of pupal weight followed by two per cent KMnO_4 (1.38g), one per cent KMnO_4 (1.37g), one per cent formalin (1.29g) and two per cent bleaching powder (1.29g). The least effective disinfectant was one per cent bleaching powder which recorded 1.28g of pupal weight significant over control where only 0.93g of pupal weight was recorded.

Shell weight

Maximum shell weight of 0.29g was recorded in two per cent formalin treatment. The next best treatment was RKO which recorded 0.26g of shell weight, followed by two per cent KMnO_4 (0.25g), one per cent formalin (0.24g), one per cent KMnO_4 (0.25g), and two per cent bleaching powder treatment (0.22g). The least effective treatment which recorded 0.21 g of shell weight was one per cent

bleaching powder which was significantly superior over control (0.09g).

Shell percentage

Maximum shell percentage of 16.30 was recorded when two per cent formalin was used as disinfectant which was on par with RKO (16.10%) and one per cent formalin (15.80%) treatment. The next best treatment was two per cent KMnO_4 which recorded a shell percentage of 15.00 followed by one per cent KMnO_4 (14.90%), two per cent bleaching powder (14.60%) and one per cent bleaching powder (14.40%), which were significantly superior over control where 9.00 per cent of shell percentage was recorded.

The results are in conformity with the results obtained by Byraredy *et al.*, (1991). Samson *et al.* (1987) reported that Reshamkeetoushad (RKO) dusted once in first, second and third moult and twice in fifth instar reduced the incidence of muscardine to seven per cent as against 70 per cent in case of control. Balavenkatasubbaiah *et al.* (1994) studied efficacy of different disinfectants *viz.*, salicylic acid, paraformaldehyde, benzoic acid, slaked lime, formalin, bleaching powder and asiphor against *B. bassiana* and reported that except slaked lime, other disinfectants were found effective in the inactivation of fungus.

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LITERATURE CITED

- Balavenkatasubbaiah M, Nataraju B, Baig M and Datta R K 1994** Comparative efficacy of different disinfectants against nuclear polyhedrosis virus (BmNPV) and *Beauveria bassiana* of silkworm, *Bombyx mori* L. Indian Journal of Sericulture 33(2): 142-145.
- Byraredy M S, Devaiah M C, Narayana Swamy T K, Govindan R and Shyamala M B 1991** Comparative efficacy of some rearing tray disinfectants in prevention of silkworm white muscardine caused by *Beauveria bassiana* (Bals.) Vuill. Sericologia 31 (3): 533-535.
- Samson M V, Baig M and Jolly M S 1987** Reshamkeet oushad - A prospective bed disinfectant against grasserie and muscardine. Indian Silk 25(1): 16-18.