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Research Notes

Efficacy of aqueous extracts of some botanicals against grasserie disease of silkworm, *Bombyx mori* L.

S. PADMA AND S. MANIMEGALAI

Department of Sericulture, Tamil Nadu Agricultural University, Coimbatore 641 003, India.

In tropical countries like India, mulberry silkworm, *Bombyx mori* L. is continuously reared throughout the year which makes it highly susceptible to pathogens and hence occurrence of diseases is a major constraint. Botanicals also have got greater relevance in the field of sericulture especially for disease management. Aqueous extract of botanicals were found promising against silkworm pest (bacterial and viral diseases of silkworm) (Manimegalai and Chandramohan, 2005& 2006). Chemical disinfectants, bed disinfectants, antibiotics and botanicals are being used for disease management as an integrated approach. Among several options, use of plant derived extracts is appropriate for the current scenario because of their cost effectiveness and ecofriendly nature. Besides the antimicrobial effects, the growth promoting factors of botanicals were also demonstrated (Manimegalai and Chandramohan, 2006). Presence of viral inhibitors had been reported in various plant species (Verma *et al.*, 1985). The effect of P. *corylifolia* against the grasserie disease of *B. mori* had been reported (Sivaprakasam and Rabindra, 1996). Botanicals serve as an environment friendly management approach against diseases. In addition, the pathogens do not develop resistance to botanicals inspite of their repeated usage.

Experiments were conducted to study the efficacy of different solvent extracts of botanicals against the grasserie disease of silkworm cross breed, PM x CSR2 with seven treatments, including extracts of five plant, one treated control and other untreated control replicated three times with 50 larvae per replication. The polyhedral occlusion bodies were collected from grasserie infected fifth instar silkworm cadaver and purified by gradient centrifugation (Sugumori *et al.*, 1990). The polyhedra in the virus suspension were counted with the help of improved Neubauer haemocytometer using phase contrast microscope. Leaves of the plant materials were thoroughly washed, then shade dried for one hour and homogenized in mixer grinder with distilled water (1:1 W/V). The filtrate obtained was centrifuged at 5000 rpm for 10 min. The supernatant constituted the standard stock extract solution (100 per cent). From this stock solution, the requisite concentration of 800 ppm was prepared with distilled water.

Fresh mulberry leaves of VI variety were dipped in viral suspension of 10^7 POBs/ml, shade dried and cut into pieces of one cm^2. The silkworms after second moult were fed with virus treated mulberry leaves. The treated leaves were provided during the first feed on first day and thereafter the larvae were fed with normal leaves. On the next day, the leaves treated with 800 ppm extracts of *P.amboinicus* and *P. corylifolia* were fed to the silkworms. Fresh leaves were dipped in required concentration of extracts and shade dried before feeding it to silkworms. Botanicals were administered twice, once on the second day of third instar and the other on the first day of fourth instar. The silkworms fed with BmNPV alone served

as treated control. Untreated control was also maintained. The larvae used for the experiment were reared as per the methods of Krishnaswami *et al.* (1973). Observations were made on larval mortality, larval weight, cocoon weight and shell weight. From the data collected, shell ratio and survival percentage were computed.

All the treatments recorded significantly lower mortality than treated control (Table 1). *P. amboinicus* and *P. corylifolia* recorded significantly lower mortality of 24.00 and 25.33 per cent respectively which were on par. They were followed by *Tribulus terrestris* (28.00%). The survival per cent was found to be significantly high in treatment with *P. amboinicus* (76.00%) and *P. corylifolia* (74.67%) which were on par, and this was followed by *T. terrestris* (72.00%). The survivability was poor in treated control (36.00%).

The larval weight in treatments with *P. amboinicus* (3.52 g), *P. corylifolia* (3.49 g) and *T. terrestris* (3.43 g) were significantly higher and all were on par with each other, followed by *Boerhavia diffusa* (3.10 g) and *Tridax procumbens* (3.06 g) (Table l).The treated control recorded significantly lower larval weight of 2.96 g. All the treatments recorded higher cocoon weight compared to treated control (1.38 g). *P. amboinicus* and *P. corylifolia* recorded cocoon weight of 1.61 g and 1.63 g respectively and were significantly higher than other treatments.Shell weight was significantly higher in treatment with *P. corylifolia* (0.29 g) which was on par with untreated control (0.29 g) and *P. amboinicus* (0.28 g). The shell weight was significantly lower (0.22 g) in treated control.The treatments with *P. corylifolia, T. terrestris,* and *P. amboinicus* recorded significantly higher shell ratio of 17.79, 17.41 and 17.39 per cent respectively and all were on par with each other. This was followed by *B. diffusa* (16.67%) and *T. procumbens* (16.19%). Treated control recorded significantly lesser shell ratio of 15.94 per cent compared to other treatments.

The present results were in concurrence with findings of Samuel Manohar Raj (1994) who reported that aqueous leaf extracts of *P. corylifolia* significantly reduced the larval mortality due to BmNPV in *B.mori.* Similarly, Manoharan (1996) reported that the aqueous extracts of *Acacia suma, Caesalpinia coriaria* and *Terminalia tomentosa* administered during third instar significantly reduced the mortality due to grasserie. Our findings also corroborated with the results of Ranganatha *et al.* (2004).

Administration of botanicals also resulted in the enhancement of the economic parameters *viz.*, larval weight, cocoon weight, shell weight and shell ratio. *P. amboinicus* and *P. corylifolia* recorded higher larval weight (3.52g and 3.49g), cocoon weight (1.61g and 1.63g), shell weight (0.29g and 0.28g) and shell ratio (17.79% and 17.39%).The results of present study fell in line with Murugan *et al.* (1998) who reported an increase in larval weight and cocoon parameters due to administration of *P. corylifolia* and *Tribulus terrestris.* Increased cocoon and shell weight were observed due to the application of *P. corylifolia* by Sivaprakasam and Rabindra(1996).

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