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Effect of botanicals on oviposition action against uji fly (*Exorista bombycis* Louis.) and their hatchability on silkworm

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The ovipositional deterrent and ovicidal activities of uji fly by spraying with different plant products on oviposition against uji fly (*E. bombycis* L.) on silkworm was studied by spraying varied concentrations, *viz.,* 1.00, 2.00 and 3.00 per cent on second day of fifth instar larvae on which eggs were laid. Significant differences were noticed among the plant products and it was lowest number of eggs laid by spraying with pongamia oil at 3 per cent concentration (2.00) followed by Mahua oil (8.00), *Clerodendron innerme* (11.00) and highest (17.66) with *Vitex negundo* as against the control (84.33). Similar trend was recorded, percentage of eggs laid over the total eggs laid was also lowest at 3 per cent (2.32) on Pongamia oil and it was highest (17.31) with *Vitex negundo*. As the concentration increased, the number of eggs laid decreased in all the plant products. The rate of eggs hatchability was nil at 3 per cent concentration on Pongamia oil as against the control (86.02%). The egg hatchability reduction over control was maximum (33.47%) at 3 per cent on *Vitex negundo* and it was nil at 3.00 per cent on Pongamia oil. Hence, the use of plant products could be an eco-friendly and low cost method for managing uji fly.

Key words : Silkworm, Botanical oils, Botanical leaf extract, Uji fly

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INTRODUCTION

Mulberry silkworm, *Bombyx mori* L. are not exception to the attack of parasitoids, predators and pathogens. Since the silkworm is a domesticated species, it is particularly vulnerable to the attack of all the three groups of natural enemies. The tachinid flies that infest and breed on silkworms are called uji flies. The term uji appears to have originated after the name of a place in Japan where a tachinid parasitoid of the silkworm was first reported (Maxwell Lefroy, 1917). In India, earlier to 1980, it was confined to North-Eastern sericulture regions of the country, especially Bengal and Assam (Jameson,1922). Since its accidental introduction to Karnataka could be traced back to the purchase and transportation of infested live Nistari cocoons from West-Bengal by the interested quarters of Karnataka obviously for preparation of cross breed layings. The fly was noticed for the first time in Bailanarasapur village of Hosakote taluk, Bangalore district during May 1980 and spread to the entire sericulture belt of Karnataka and today all the sericulture states south India are affected with this pest (Anonymous,1980). Silkworms are attacked by uji fly, only when they have passed third moult (Anonymous,1922). Young silkworms (first to third instar) practically escape from infestation. Ordinarily the uji fly prefers fourth and fifth instar silkworm. If the infestation takes place during fourth and early fifth instar silkworm are die invariably before they reach spinning stage and farmers are loss 20-30 per cent cocoon production (Anonymous, 2008).

RESEARCH METHODOLOGY

The experiment was conducted at College of Agriculture, U.A.S. (D), Bijapur, during 2009-2010. The oils and leaves of respective plant products were collected separately. Then leaves were crushed using pestle and mortar and soacked in distilled water for about 12 hours. Thereafter, the extract was filtered and prepared for different concentrations (*viz.,* 1.00, 2.00 and 3.00%) using distilled water. Population of uji fly, *Exorista bombycis* L. was maintained in the laboratory in fly proof netted cages of 60x60x60 cm cube square with a circular sleeve for the passage. The emergence flies were fed with 10 per cent glucose solution soacked in cotton swab (Sriharan *et al*., 1980). Further, a day old fifth instar silkworms were taken @ 100/conc/treatments for three replication and sprayed with

different concentration separately and then the gravid female uji flies was allowed for oviposition on silkworms for 30 minutes (Datta and Mukherjee, 1978). Afterwards, the number of infested silkworms were counted and fed with mulberry leaves for egg hatchability and it was recorded after 48 hours at each concentration by the following formula:

$$\text{Haching}\,(\%) = \frac{\text{Number of eggs hatched}}{\text{Total number of eggs laid}} \text{x } 100$$

RESEARCH FINDINGS AND ANALYSIS

The number of egg laid by the uji fly on silkworm after spraying with oils and aqueous leaf extracts in different concentrations is presented here under (Table 1). Significantly minimum (2.00) number of eggs were laid by uji fly on silkworm sprayed with Pongamia oil at 3.00 per cent followed by Mahua oil (8.00), aqueous leaf extract of *Clerodendron inerme* (11.00) and aqueous leaf extract of *Vitex negundo* (17.66) as against the control (84.33). A similar trend was observed on the percentage of eggs laid over the total eggs laid (2.32, 8.66 and 11.54%). The hatchability was nil at 3.00 per cent as against the control (86.02%) in case of Pongamia oil followed Mahua oil (20.75%), *C.inerme* (36.36%) and *V.negundo* (43.27%). Similar trend was observed on the per cent reduction over control which was maximum (33.47%) at 3.00 per cent on *V.negundo* followed by *C.inerme* (29.71%), Mahua oil (17.16%) and it was nil (0.00%) on Pongamia oil, respectively. The present findings are more or less comparable with the observations of Narayanaswamy (1997), who evaluated the plant products derived from flowers of *Michalia champaka*, leaves and seeds of *Melia azadirachta* and seeds of *Azadirachta indica,* which induced 69.72 to 80.00 per cent egg mortality when sprayed on 24 hrs old eggs of *E. bombycis*. The extract from *M.champaka* and *Catharanthus* sp. were moderately effective in causing egg mortality of 40 to 69.20 per cent, respectively. Further, Narayanaswamy and Dandin (1998) reported that the egg hatchability of *E. bombycis* was reduced to 4.42 to 6.62 per cent when the eggs were exposed to volatiles emanating from crushed bulbs of *Allium sativum* for 72 and 64 hrs, respectively.

Similarly, present findings are in close agreement with the observations of Murugesh *et al*. (2010) who observed ovipositional deterrent and ovicidal activities of various plant products were studied against uji fly. Among all the plants, *Eucalyptus citriodora*, *Tridax procumbens, Parthenium hysterophorus* and *Tribulus terristris* recorded lowest oviposition of 54.50, 55.00, 62.25 and 58.00 per cent and egg hatchability of 67.61, 68.29 and 69.92 per cent, respectively, where highest concentration at 0.80 per cent.

Conclusion:

Since the host itself is an insect and insecticidal measures

cannot be taken against a pest associated with an insect host. Hence, the use of botanicals oils and botanical leaf extract could be an eco-friendly and low cost method for managing uji fly.

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