SHORT COMMUNICATIONS

Reproductive Efficiency in *Earias fabia* STOLL (Lepidoptera: Noctuidae) Affected by Neem Oil Vapour¹

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Adults of *Earias vitella* exposed to oil vapours of *Blumea eriantha*, a mildly growing weed and a non-host plant of this insect, showed a reduction in their mating ability with males principally getting affected (DONGRE and RAHALKAR, 1982). Taking this as a cue, we considered it desirable to examine whether a similar situation would prevail in the spotted bollworm, *Earias fabia*—a major pest of cotton and okra in the tropics (MEHTA, 1977)—if males, females or both sexes of the moths in their adult stage were subjected to the vapour action of the oil expelled from the seeds of the Indian neem tree, *Azadirachta indica* A. JUSS whose diverse detrimental biological effects as repellent, anti-feedant, growth disruptor and on egg development for a number of insect species are well known (REED et al., 1982; SINGH, 1982; SAXENA, 1983; SCHMUTTERER et al., 1983; BHANOTAR and SRIVAS-

TAVA, 1984; SAXENA and KHAN, 1984; JHANSI RANI, 1984; REMBOLD, 1984). We present our data obtained from such a study in this communication.

Adults of either sex of *E. fabia* employed in all experiments described here were individually reared from the egg stage on developing seeds of okra in the laboratory (VISHWAPREMI and KRISHNA, 1974). The crude neem oil used in the tests was extracted after decortication of seeds harvested from 1982 crop.

A freshly emerged male or a female moth was exposed at a time, inside a 250 ml glass beaker tightly covered at the top by parafilm for a period of 30 min to oil vapours emanating from filter paper discs impregnated with 0, 20, 40, 80 or 160 μ l of the oil. Contact of the moths with the untreated or treated paper discs, placed at the bottom of the beaker, was prevented by a wire-mesh partition (0.2 mm thickness; 200 meshes/cm²). At the end of exposure time, single pairs were formed from males and females subjected to identical treatment or from one of the sexes having no interaction with oil vapours and the other previously held in an environment consisting of vapours volatalizing from 160 μ l of the oil to facilitate mating and subsequent oviposition by the female. The general layout of the oviposition trials was similar to that described earlier (SHAH and KRISHNA, 1979). Total number of eggs laid were monitored daily during the first 4 days of oviposition (the period when the moths, during their life time, deposited most of their eggs) and the hatchability of these eggs was also recorded. The experiments were

Table 1. Estimates of oviposition and hatchability of eggs laid by mated females of *Earias fabia* in tests where both males and females were exposed to neem oil vapour

Volume of neem oil (in μ l) applied on filter paper disc	Number of egg/females Mean value $\pm$ S.D. ^a	Percent of hatchability/females Mean value $\pm$ S.D. ^a
0 (control)	216.6 $\pm$ 41.0	86.3 $\pm$ 4.7
20	195.6 $\pm$ 67.3*	83.0 $\pm$ 4.3*
40	221.4 $\pm$ 26.5*	84.0 $\pm$ 5.4*
80	259.4 $\pm$ 69.1*	85.7 $\pm$ 6.5*
160	141.6 $\pm$ 41.1**	59.2 $\pm$ 22.2**

^a Five replications.

* Not significant at 5% level in *t*-test by WELCH's method.

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Table 2. Estimates of oviposition and hatchability of eggs in *Earias fabia* in tests where males or females included in copulating pairs were exposed to neem oil vapour

Sex exposed to vapour from filter paper disc with 160 μ l of neem oil	Number of egg/females Mean value $\pm$ S.D.	Percent of hatchability/females Mean value $\pm$ S.D. ^a
Male	357.0 $\pm$ 98.9	63.9 $\pm$ 7.8**
Female	342.8 $\pm$ 41.5	85.7 $\pm$ 3.9

^a Five replications.** Significant at 5% level in *t*-test using control data (86.3 $\pm$ 4.7) from Table 1.

adequately replicated. All tests were performed at 27 $\pm$ 2°C in which r.h. was maintained at 90 $\pm$ 10%.

Notwithstanding absence of any marked extension in the preoviposition period of these mated females of *E. fabia*, unlike that observed in *E. vitella* treated with *B. eriantha* oil (DONGRE and RAHALKAR, 1982), a pronounced reduction in egg output and egg viability occurred in the moths when both sexes were confined for the prescribed limited period in an environment consisting of neem oil vapours emanating from 160 μ l of the oil (Table 1). Plausibly vapours from such an oil dose deleteriously affects the delicate and sensitive mechanisms associated with mating—a decisive factor influencing the total number of eggs a species lays (ENGELMANN, 1970)—as well as those concerning fertilization in the reproductive physiology of this noctuid pest.

Copulation between normal females and males exposed to such oil dose resulted in a relatively greater decline in the deposition of fertile eggs than that obtained in a vice versa situation (Table 2). The outcome of such fall in the reproductive potential is possibly due to some kind of spermicidal effect of the vapour action of neem oil leading to less number of eggs getting fertilized in the females.

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