

OVIPOSITIONAL PREFERENCE OF *Helicoverpa armigera* TO TOMATO CULTIVARS

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ABSTRACT

Laboratory and field experiments on the ovipositional preference of *Helicoverpa armigera* (Hubner) on tomato revealed that more eggs were laid on the under surface of leaves than on the petiole, inter nodal stem and calyx. Hairy varieties received more eggs than the glabrous varieties. The cultivar Paiyur-1 combining the character of less trichomes and longer calyx received less eggs than the cultivars Madanapalli and PKM-1.

KEY WORDS : *Helicoverpa armigera*, Tomato, Types, Oviposition, Trichomes

Helicoverpa armigera (Hubner) is a major pest of tomato in India. As a fruit borer, it causes upto 70 per cent damage. Its damage to tomato became severe in areas where the insecticides failed to give the desired effects, because of development of resistance to insecticides and therefore there is an urgent need to find out alternate methods to manage this pest. In cotton, several morphological traits of plant such as glabrousness, pigmentation, nectarilessness, fregobract either alone or in combination have been reported to reduce the population of *Heliothis* (Lukfahr, 1982). This paper reports the results of investigations on the ovipositional response of *H. armigera* as affected by certain cultivars of tomato.

MATERIALS AND METHODS

Ovipositional site

The preferred site for oviposition from 25 plants of tomato of variety Co 3 was observed at random both under caged and field conditions. The upper and lower leaf surfaces, internodal stem and petiole from the top, middle and bottom portion of the plants were examined in each plant. The calyx and blossom end of fruits were also examined and expressed as number per leaf, petiole and 5 cm of internodal stem.

Ovipositional preference

Seedlings of tomato genotypes/cultivars viz., Pusa Ruby PKM1, Co 3, Paiyur-1, X33, X35, X44-4-1, X44 and Madanapalli were transplanted in pots (45 x 20 cm), replicated five times. The pots were placed inside the screen cages (180 x 120 x 60

cm). Mated female moths were released at nine per cage during evening hours while the plants were in flowering and early fruit formation stages. The moths were confined overnight. The number of eggs laid by moths on different types of tomato was recorded and subjected to statistical analysis (Panse and Sukhatme, 1967)

Trichome density

To assess the means of resistance, the density of trichome present at lower leaf surface, petiole, internodal stem and calyx were recorded from ten

Table 1. Site of oviposition of *H. armigera* on tomato (Mean of 25 plants)

Portion of the Plant	Location	Number of eggs laid*	
		Field	Cage
Top	UL	2.1 ± 0.25	3.6 ± 0.28
	LL	5.0 ± 0.30	6.5 ± 0.36
	INS	1.6 ± 0.06	2.6 ± 0.29
	P	0.8 ± 0.02	1.8 ± 0.08
Middle	UL	2.1 ± 0.03	3.0 ± 0.20
	LL	11.3 ± 1.80	16.9 ± 1.20
	INS	0.50 ± 0.20	0.90 ± 0.20
	P	1.40 ± 0.60	1.80 ± 0.30
Bottom	UL	0.6 ± 0.01	0.4 ± 0.01
	LL	1.8 ± 0.01	1.9 ± 0.01
	INS	0.6 ± 0.1	1.5 ± 0.01
	P	1.2 ± 0.01	1.7 ± 0.01
Calyx	-	0.8 ± 0.01	1.8 ± 0.02
Fruit	Blossom end	3.7 ± 0.12	3.0 ± 0.02

* Number per leaf; number per 5 cm INS; number per petiole
UL - Upper leaf; LL - Lower leaf; INS - Internodal stem;

Table 2. Ovipositional preference of *H. armigera* and trichome density and calyx area in different types of tomato

Type	Mean number of eggs laid per plant	Relative Mean per cent oviposition	Number of trichome (mm ²)				Calyx area (cm ²)
			Leaf	Petiole	Internodal stem	Calyx	
Pusa Ruby	22.6 ^{cd}	11.00	18.5 ^c	6.5 ^a	3.7 ^{ab}	2.0 ^a	2.566 ^c
PKM 1	19.6 ^{bc}	7.96	12.2 ^{ab}	7.6 ^a	3.0 ^{ab}	1.7 ^a	2.192 ^d
Co 3	26.4 ^c	12.83	19.2 ^{cd}	8.5 ^b	4.4 ^b	3.0 ^c	2.296 ^c
Paiyur 1	13.6 ^b	6.60	10.2 ^a	5.8 ^a	2.4 ^a	1.2 ^a	3.470 ^a
X 33	16.0 ^{dc}	12.63	18.8 ^c	12.2 ^c	3.6 ^{ab}	2.6 ^b	2.404 ^c
X 35	16.4 ^{ab}	9.52	17.1 ^{bc}	10.0 ^c	5.6 ^c	4.1 ^d	2.284 ^c
X 44-4-1	26.4 ^c	12.82	19.0 ^{cd}	11.8 ^d	6.8 ^c	3.7 ^d	2.692 ^b
X 44	26.8 ^c	13.02	18.4 ^c	11.3 ^d	6.6 ^c	3.0 ^c	3.256 ^a
Madannapalli	28.0 ^c	13.62	20.4 ^d	10.5 ^d	5.7 ^c	4.7 ^d	2.274 ^c

In a column means followed by similar letters do not differ significantly ($P=0.05$) by DMRT

randomly selected plants of each tomato type using an ocular micrometer.

RESULTS AND DISCUSSION

Greater oviposition was noticed in the middle of plant compared to top and bottom portions. Egg laying was maximum on the lower leaf surface with a mean of 11.3 ± 1.80 and 16.9 ± 1.20 eggs in cage and field studies respectively. Egg laying was minimum on internodal stem, petiole, calyx and fruit (Table 1). Contrary to the present findings, the upper surface of the leaf was a preferred ovipositional site on cotton (Patel *et al.*, 1974; Jayaraj, 1982)

There was significant differences in the numbers of eggs deposited in different tomato cultivars (Table 2). It was maximum on Madanapalli (29.0 eggs per plant) and minimum on Paiyur-1 (13.6 eggs/plant). The trichome density in leaves, petiole, internodal stem and calyx were significantly less on Paiyuri than on the other cultivars (Table 2). The area of calyx was maximum in Paiyur 1 which covers the fruits and prevents the feeding of larvae which in turn reduces

the damage. The present findings are in accordance with that of Lukefahr *et al.*, (1975), Robinson *et al.*, (1980) and Lukefahr, (1982)

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