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Bio-Ecology and Reproductive Potentiality of *Helicoverpa* (*Heliothis*) *armigera* Hubner on Different Host Crops

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Gram pod borer, *Helicoverpa* (*Heliothis*) *armigera* Hubner (Noctuidae : *Lepidoptera*) is a cosmopolitan polyphagous pest. The larva causes severe damage to cotton, *Gossypium hirsutum* L. gram, *Cicer arietinum* L. pigeonpea, *Cajanus indicus* Sprengl, tomato, *Lycopersicum esculentum* Mill. potato, *Solanum tuberosum* L., cabbage, *Brassica oleracea* (capitata) L. etc. by boring the bolls, pods and fruits. Information about it's development and reproductive potentiality on these host crops is scanty so such laboratory-cum-field study was carried out during 1989-90.

The larvae of *H. armigera* collected from the tomato field were reared on tomato fruits in the laboratory by following the rearing technique developed by Patel *et al.*, (1968). First instar larvae hatched out from the eggs laid by these moths were reared separately on different hosts (Table-1). Fifty larvae were reared on each host crop separately in plastic tubes (7.0 x 3.5 cm) till second instar and then they were reared on respective host crop in field condition till pre-pupation by releasing 10 larvae per plant. The plants were caged after releasing the larvae. The prepupae were brought to the laboratory and kept separately till emergence of adults. The newly emerged moths were paired and transfered in glass chimney for oviposition on the twigs of respective host plant which were kept in the chimney by wrapping cotton wool in plastic tube containing water for keeping the leaves in turgid condition. Every day twigs of various host crops and honey solution which was kept as food of moths were replaced. The eggs after counting were under observation till hatching. The data collected were statistically analysed.

The study on the influence of food on the development of *H. armigera* (Table-1) in various abiotic conditions in *kharif* revealed significantly prolonged larval period on pigeonpea as compared to groundnut at 28.04 ± 7.76°C and 84% R. H. Whereas, no significant difference in larval period was observed for larvae reared on cotton to pigeonpea as well as groundnut. The larval survival on pigeonpea was significantly higher as compared to cotton and groundnut. Ofcourse, the larvae reared on later two hosts did not show any significant difference in the survival. Pre-pupal period was significantly longer on groundnut at 26.90 ± 9.08°C

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TABLE 1

Effect of food and meteorological conditions on the development of *H. armigera* Hb. in different seasons.

	Mean period (days) of the various stages						Total life span		Aver-	Hatch-	Lar-	Adult	Growth
					Adult		Male	Female	age fecun-	ing	val sur-	emer-	index
Host	Egg	Larval	Pre-pupal	Pupal	Male	Female			dity	(%)	vival (%)	gence (%)	
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
						KHARIF							
Temp °C	28.92±5.09	28.04±7.76	26.90±9.08	26.7±7.79	25.9±8.25		27.27±7.76						
R. H. (%)	88.5	84.0	81.4	78.0	76.35		81.47						
Pigeonpea	4.00	14.95	1.91	6.22	4.60	6.00	31.68	33.08	599.3	71.88	84.00	74.0	5.60
Groundnut	4.00	12.88	2.38	6.63	4.67	6.33	30.56	32.22	582.5	75.00	52.0	75.0	3.01
Cotton	4.00	13.93	1.93	9.50	3.80	6.00	33.16	35.36	446.0	65.00	56.0	57.0	3.85
S. Em. ±	—	0.54	0.13	0.77	0.99	0.88	—	—	130.16	3.94	1.63	2.24	0.07
C. D. at 5%	—	1.51	0.37	2.20	NS	NS	—	—	NS	NS	5.65	7.74	0.24
C. V. %	—	21.10	22.66	37.24	49.17	27.86	—	—	41.03	9.96	4.42	5.64	2.87

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
					RABI								
Temp °C	23.92 ± 2.02	21.65±6.53	17.55±4.24	20.25±2.85	21.92±2.62		21.23±3.48						
R. H. (%)	75.0	75.71	71.6	71.05	72.61		73.19						
Tomato	5.0	31.50	2.36	22.64	5.50	9.71	66.50	70.71	415.0	45.27	28.00	96.67	0.90
Potato	5.0	24.18	1.86	16.94	9.73	11.50	57.71	59.48	546.0	48.16	44.00	93.33	1.82
Gram	5.0	30.00	2.33	22.08	7.00	10.17	66.41	69.58	415.0	37.50	32.00	89.33	1.58
Cabbage	5.0	24.94	2.38	26.46	8.00	9.67	66.78	68.47	227.5	46.95	34.00	88.33	1.36
S. Em. ±	—	0.94	0.13	2.24	1.33	1.52	—	—	156.61	4.70	2.53	3.37	0.04
C. D. at 5%	—	2.65	0.39	6.29	NS	NS	—	—	NS	NS	8.26	NS	0.11
C. V. %	—	14.08	24.00	37.50	41.24	32.66	—	—	61.38	17.92	12.72	6.35	0.09

and 81.4% R. H. Whereas, pupal period at 26.71 ± 7.79°C and 78% R. H. was longer on cotton as compared to the rest of the two hosts. The moth emergence was significantly high on groundnut and pigeonpea as compared to cotton. *Helicoverpa* larvae reared on pigeonpea had significantly higher growth index as compared to cotton and groundnut. Valand and Patel (1992) have also found higher larval survival and growth index on pigeonpea than chickpea. The life span was shorter on pigeonpea than cotton. Goyal and Rathod (1988) have also similar observation.

The larval development of *H. armigera* during rabi (Table-1) on tomato and gram was found significantly slower as compared to cabbage and potato at 21.65 ± 6.63 °C and 75.71% R. H. Whereas, the larval survival was significantly higher on potato than tomato, gram and cabbage. The larvae reared on potato had shortest prepupal (17.55 ± 4.24 °C and 71.6% R. H.) and pupal period (20.25 ± 2.85 °C and 71.05% R. H.). The significantly higher growth index was observed on potato followed by gram, cabbage and tomato.

Thus, the larval survival and growth index was found high on pigeonpea and potato as compared to rest of the hosts studied. However, no significant effect was observed of any of the host crops on the fecundity and hetchability of eggs.

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