

## Natural Parasitism of Pomegranate Butterfly, *Deudorix epijarbas* Moore in Mid-Hill Regions of Solan and Sirmaur, Himachal Pradesh

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The pomegranate butterfly, *Deudorix epijarbas* Moore has in recent years gained much economic importance in the mid-hill regions of Himachal Pradesh (Kakar *et al.*, 1987; Prasad *et al.*, 1987 and Thakur *et al.*, 1988b). Sometimes, the damage is so severe that the whole fruit is ruined and it becomes unsuitable for consumption. Since chemical control of this pest is neither feasible nor economical (Kakar and Sharma, 1988), the present study was undertaken to find out the natural enemies of *D. epijarbas* and their natural parasitism in the mid-hill areas of Solan and Sirmaur districts in Himachal Pradesh, where pomegranate is grown as a wild form.

Extensive and intensive surveys were conducted at Narag and Nohra in Sirmaur district; Salagora, Dharampur, Arki and Otchghat in Solan district from May to October, 1988. All stages of *D. epijarbas* were collected from the fields and reared under laboratory condition at  $25 \pm 1^\circ\text{C}$  and  $70 \pm 5\%$  RH for the emergence of natural enemies.

Larvae of *D. epijarbas* were reared individually in glass tubes to avoid cannibalism (4"x1.5") on pomegranate seeds until pupation. The field-collected eggs and pupae as well as pupae reared in the laboratory were kept in glass tubes separately. The mouth of the glass tubes were covered with fine muslin cloth and tied with the help of rubber bands. Correlation studies were made between the number of eggs, larvae and their parasitism to determine the relationship of parasitism to the density of host stages in the field under natural conditions.

The data obtained on the extent of egg and larval parasitism at different localities are presented in Table 1. The egg parasitoid, *Telenomus cyrus* Nixon(?) and the larval parasitoid, *Apanteles* sp. *vitripennis* group were

obtained from field eggs and larvae of *D. epijarbas*. The egg parasitoid was recorded for the first time from the mid-hill region of Solan and Sirmaur districts while in Kullu valley it has already been reported by Thakur *et al.* (1988a). The larval parasitoid recorded from this region was also earlier reported by Rawat *et al.* (1988) but without giving its extent of parasitism. Parasitism by the egg parasitoid, *T. cyrus* was observed to be 6.00-10.00% at various localities while parasitism by *Apanteles* sp. *vitripennis* group varied between zero-16%. The reasons for the low egg parasitism as compared to Kullu Valley might be due to the prevalence of only one egg parasitoid recorded so far from this region. The high egg parasitism (0.0-62.0%) recorded from Kullu valley (Thakur, *et al.*, 1988a) may be due to the combined action of different egg parasitoids available under the agroclimatic conditions of Kullu valley. Correlation studies revealed that the density of eggs and larvae were positively correlated with their natural parasitism (Table 1).

The above study has clearly indicated that these native parasitoids may be useful in the management of the pest. These may be mass reared in the laboratory and subsequently released in problem areas for the biocontrol of the target pest.

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**KEY WORDS:** Natural parasitisation, *Deudorix epijarbas*, *Telenomus cyrus*, *Apanteles vitripennis*, biocontrol, correlation

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TABLE 1 Extent of natural parasitism of *D. epijarbas* in different localities during 1988

Localities	Egg parasitism			Larval parasitism		
	Month of observation	Number of eggs examined	% parasitism	Month of observation	Number of larvae examined	% parasitism
1. Sirmaur district						
i. Narag	June	70	10.00	July	40	7.50
	July	60	8.33	August	30	6.66
				September	20	5.00
ii. Nohra	June	55	7.27	July	35	5.71
	July	70	8.57	August	50	8.00
				September	30	6.66
2. Solan district						
i. Salogara	June	80	10.00	July	60	8.33
	July	50	6.00	August	80	11.25
				September	55	7.27
ii. Dharmpur	June	60	6.66	July	90	10.00
	July	40	7.50	August	50	16.00
				September	100	10.00
3. Arki						
	June	35	8.57	July	60	11.66
	July	20	10.00	August	120	10.83
				September	20	00.00
4. Oatchghat						
	June	45	6.66	July	70	11.42
	July	60	10.00	August	30	13.33
				September	40	12.50
	Mean	53.75	8.29		54.44	9.00
	Standard Deviation	16.09	1.41		27.48	3.56
	Coefficient of correlation		(+ 0.173)			(+ 0.430)

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