

Incidence of *Deudorix epijarbas* Moore (Lepidoptera : Lycaenidae) and its parasitoids on pomegranate in Jammu region

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ABSTRACT : Studies conducted during 1993 on incidence of pomegranate fruit borer and its natural enemies in Jammu region of Jammu & Kashmir state revealed that only *Deudorix epijarbas* Moore is infesting pomegranate in this region. Mean fruit infestation was 25.33%, however, infestation was lower at Kud which is located at higher altitude in comparison to Chenani and Dhrumtal. Two species of parasitoids i.e. *Anastatus* sp. nr. *kashmirensis* Mathur and *Telenomus* (?) *cyrus* Nixon were recorded parasitizing on an average 56.43% eggs. Inundative releases of *Trichogramma chilonis* Ishii did not result in its establishment.

KEY WORDS : Biological control, *Deudorix epijarbas*, natural enemies, parasitoids, pomegranate butterfly, *Trichogramma chilonis*

Fruit borer, *Deudorix epijarbas* Moore (Lepidoptera : Lycaenidae) has been reported as a serious pest of Pomegranate, *Punica granatum* Linnaeus in Himachal Pradesh (Butani, 1976; Prasad *et al.*, 1987) and Kashmir (Zaka-Ur-Rab, 1980). The first instar larvae of the pest bore into fruits, feed upon pulp and seeds causing either immature fruit drop or make fruits unfit for consumption. Chemical control of the pest is often ineffective, expensive and hazardous to operators as well as to beneficial organisms due to long residual toxicity. Bagging of fruits in the initial stage also proved laborious and not feasible in big orchards. Successful control of this pest through introduced and native parasitoids in Kullu Valley (H.P.) has been reported earlier (Thakur *et al.*, 1991; 1993).

Keeping in view the above facts, the present investigations were carried out in Jammu region of Jammu & Kashmir to know the species present, its status, natural enemy complex and feasibility of using laboratory reared *Trichogramma chilonis* Ishii for its biological control.

Field surveys were conducted once in a week during August and September at three different localities of major pomegranate growing areas of Jammu region. These localities were Dhrumtal, Chenani and Kud at a height of 1450, 1540 and

1760 m above mean sea level, respectively. During each visit, ten pomegranate trees were selected randomly at each place. From each tree, 15 fruits were examined randomly for the presence of holes made by larvae for calculation of per cent fruit infestation. Also, the eggs, larvae and pupae of the pest collected were brought to laboratory for further examination. Eggs pasted on paper strips were examined for emergence of parasitoids. Larvae were reared singly on pomegranate seeds in petri-dishes to avoid cannibalism. Larval food was replaced daily to avoid fermentation or fungal infection. Observations were made on emergence of larval parasitoids. Pupae placed in plastic jars were observed for emergence of pupal parasitoids. Laboratory reared *T. chilonis*, an egg parasitoid, was released in each visit at the rate of 1,50,000/ha. In total about 9 lakh wasps were released in August and September, 1993 synchronising with the egg laying. Recovery tests were conducted by either collecting butterfly eggs from release sites and observing them in laboratory for parasitoids emergence or by tagging *Corcyra cephalonica* Stainton egg strips on pomegranate plants and examining them in laboratory for parasitism, 2-4 days after collection.

Results revealed that *D. epijarbas* is present in different places and incidence ranged between 17.33 to 36.66 (Table 1). Fruit infestation was found

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significantly lower in first season at Kud which is at higher altitude as compared to Chenani and Dhrumtal. In Himachal Pradesh, fruit infestation ranged between 12 - 94% (Prasad *et al.*, 1987). From field collected eggs, two species of eggs parasitoids i.e. *Anastatus* sp. nr. *kashmirensis* Mathur and *Telenomus* (?) *cyrus* Nixon were obtained. The combined parasitism by these parasitoids ranged between 22.22 - 81.01% and averaged to 56.43% (Table 1). These parasitoids are reported for the first time on eggs of *D. epijarbas* in this region. However, these parasitoids have already been reported on eggs of this pest in H.P. (Thakur *et al.*, 1988). No larval and pupal parasitoids were

recorded in the present investigation. *Brachymeria* sp. has been reported attacking fresh pupae of pomegranate butterfly, *Virachola livia* Klug in Egypt (Awadallah *et al.*, 1970).

Recovery tests conducted following the releases of *T. chilonis* did not show its establishment during the present study. Contrary to this, *T. chilonis* has successfully established against *D. epijarbas* in Kullu Valley and Solan (H.P.) (Thakur *et al.*, 1991;) (Rawat and Pawar, 1991). The reasons behind the failure to recover the released egg parasitoids, *T. chilonis* in the present study needs further investigation.

Table 1. Incidence of *Deudorix epijarbas* and its parasitoids

Date	Place	Fruit infestation (%)	Egg parasitism (%)
5.8.93	Dhrumtal	33.66 ^a	64.70
	Chenani	20.66 ^b	69.56
	Kud	19.33 ^b	36.58
13.8.93	Dhrumtal	33.66 ^a	57.69
	Chenani	34.66 ^a	22.22
	Kud	17.33 ^b	59.18
20.8.93	Dhrumtal	32.00 ^a	46.15
	Chenani	28.66 ^a	38.46
	Kud	17.33 ^b	69.23
26.8.93	Dhrumtal	21.33 ^a	49.93
	Chenani	28.66 ^a	60.71
	Kud	18.00 ^b	64.00
9.9.93	Dhrumtal	26.00 ^a	47.25
	Chenani	25.33 ^a	81.08
	Kud	26.66 ^a	66.66
17.9.93	Dhrumtal	-	-
	Chenani	27.33 ^a	60.00
	Kud	20.66 ^a	65.21
Mean	-	25.33	56.43

* Figures bearing the same letters of same date are not statistically different from one another (P = 0.05)

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