

Survey for Natural Enemies of Pomegranate Butterfly, *Deudorix epijarbas* Moore in Himachal Pradesh

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ABSTRACT

Survey for the natural enemies of pomegranate butterfly, *Deudorix epijarbas* Moore in district Kullu of Himachal Pradesh revealed the occurrence of three egg parasites, viz., *Anastatus* sp. nr. *kashmirensis* Mathur, *Aphelinus* (?) *gossypii* Timberlake and *Telenomus cyrus* Nixon (?), two larval parasites, viz., *Apanteles* (?) *obliquae* Wilkinson and *Apanteles* sp. *vitripennis* group. Laboratory-reared species of *Trichogramma* viz., *T. brasiliensis*, *T. exiguum*, *T. chilonis*, *T. minutum* and *T. perkinsi* did not parasitise the eggs in the laboratory as well as in the field.

KEY WORDS: Pomegranate butterfly, *Deudorix epijarbas*, egg and larval parasites

Among the pests of pomegranate, the butterfly, *Deudorix epijarbas* Moore has been reported as one of the most serious pests attacking the fruits in Himachal Pradesh (Butani, 1976; Prasad *et al.*, 1987) and Jammu and Kashmir (Zaka-Ur-Rab, 1980). In Solan district (H.P.) alone, its attack during the month of July 1982 varied between 12-94% (fruit-wise) (Prasad *et al.*, 1987). Chemical insecticides are often ineffective and if used, are likely to cause toxic and environmental hazards. Hence, investigations were made to detect the presence of native natural enemies of this pest as well as to test the effectiveness of *Trichogramma* spp. against the pest.

MATERIALS AND METHODS

Surveys were conducted to identify the native parasites and predators of *D. epijarbas* between 1983-1987 in the various pomegranate growing areas in the district Kullu, H.P. Eggs, larvae, prepupae and pupae of *D. epijarbas* were collected from the field and observed in the laboratory for the emergence of parasites. Infested fruits collected from the fields were cut open, larvae taken out and reared individually in small Petri dishes to avoid cannibalism. Larvae were provided daily with fresh seeds of pomegranate and care was taken to prevent fermentation or fungal infection. Pupae collected from the fields were kept in plastic jars covered with muslin cloth. Observations were made on the emergence of parasites from the different stages of the pests.

Five species of laboratory-reared *Trichogramma* viz., *T. brasiliensis* Ashmead, *T. chilonis* Ishii, *T. exiguum* Pinto, Planter & Oatman, *T. minutum* Riley and *T. perkinsi* Girault were released in the problem areas at the rate of approximately 2,00,000 wasps per 0.4 ha at a time, twice in a month. The releases were made from May to November synchronising with the pest incidence. Post-release recoveries were made by two different methods. First method included collection of butterfly eggs from the release sites and observing in the laboratory for parasitism. The second method consisted of tagging of *Corcyra* egg strips on pomegranate trees 15 days after release of parasites. These egg strips were collected after 10-15 days of installation and observed in the laboratory for parasitism.

RESULTS AND DISCUSSION

From field collections, three egg parasites viz., *Anastatus* sp. nr. *kashmirensis* Mathur *Aphelinus* (?) *gossypii* Timberlake, and *Telenomus cyrus* Nixon (?) and two larval parasites viz., *Apanteles* (?) *obliquae* Wilkinson and *Apanteles* sp. *vitripennis* group were obtained.

It is of particular interest to note that these parasites were reported for the first time on pomegranate butterfly in H.P. The data obtained on the extent of egg and larval parasitism at different localities are furnished in Table 1. Maximum egg parasitism (61.99%) was recorded at Seobag and Kullu, while no

TABLE 1. Occurrence of egg and larval parasites of *D. epijarbas* in different localities in district Kullu (H.P)

Name of localities	Number of eggs examined	% parasitism	Number of larvae examined	% parasitism
Bhuntar and Bajaura	142	26.1	480	8.5
Bhuthi, Bharai and Rajak	220	00.0	332	6.9
Chanikhor and Jari	273	48.0	545	10.5
Katrain and Patlikuhl	182	31.3	172	11.6
Seobag and Kullu	321	62.0	247	15.4

parasitism was observed at Bhuthi, Bharai and Rajak. The per cent larval parasitism varied between 6.9-15.4% minimum being at Bhuthi, Bharai and Rajak. Egg parasites were more predominant than the larval parasites. The larval parasite *Apanteles* sp. *vitripennis* group recorded from Salogra and Sproon in district Solan has not been reported so far from district Kullu. No pupal parasites were reported. However, *Brachymeria* sp., a pupal parasite has been found attacking fresh pupae of pomegranate butterfly, *Virachola livia* Klug (Awadallah *et al.*, 1970).

None of the *Trichogramma* spp. was found to parasitise the eggs of the pomegranate butterfly in the field as well as laboratory studies. However, the incidence of the pest decreased following the releases of these parasites in the fields. The reduction in fruit infestation ranged between 10.09-22.18, 9.78-20.58, 9.08-15.20 and 8.80-13.50% during the years of 1984-1987, respectively, at different localities. Similarly, Kakar and Sharma (1988) reported reduction in fruit infestation following the releases of the same five species of *Trichogramma* as in the present study, but without recovery. But, Awadallah *et al.* (1970) found *Trichogramma evanescens* to be an effective egg parasite of *V. livia*. There is also a report of larval parasitism in *Hypolycea phorbas* F. a lycaenid butterfly (Valentine, 1979). He further reported that all the field-collected pupae of *H. phorbas* were parasitised either by tachinid flies or by ichneumonid wasps. Similar observations were made by Common and Waterhouse (1972).

It is concluded from the present studies that effective biological control of pomegranate

butterfly could be achieved by rearing the native parasites in the laboratory and subsequently releasing them by inundative method in the problem areas. However, our knowledge about the natural enemies of *D. epijarbas* is still meagre and more intensive survey might yield many more natural enemies.

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