SHORT NOTE

BIOLOGY OF Papilio demoleus Linn. INFESTING
COMMERCIALY CULTIVATED MEDICINAL PLANT
Psoralea corylifolia Linn.

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The state of Himachal Pradesh is bestowed
with rich medicinal flora. The topographical/
geographical location and agro climatic
conditions are suitable for the cultivation of
various medicinal plants (Chauhan, 1996).
Psoralea corylifolia Linn. a medicinal plant is of
commercial importance and is suitable for
cultivation under the mid hill conditions of
Himachal Pradesh. The seeds of the plant are
specially recommended in the treatment of
leucoderma, leprosy, psoriasis and inflammatory
diseases of the skin. They are also used in
indigenous medicine as laxative, aphrodisiac,
anthelmintic and diuretic. This particular
medicinal plant species was found to be more
prone to the attack of Papilio demoleus during
the preliminary field surveys. Earlier,
Heeson (1961), Purohit et al. (1966), David and
Kumarswami (1978) have also reported
P. demoleus to be a pest of P. corylifolia.

Before adoption of any of pest control
methods, understanding of the biology of
different economically important insect pests is
important in order to determine the appropriate
timing of executing pest control strategies. As
far as biological studies of P. demoleus Linn.
are concerned, no information is available for the
mid hills of Himachal Pradesh. Most of the
earlier work done was confined to citrus plants,
as it is the major pest of citrus orchards.
However, little work related to P. corylifolia was
also found. Pandey and Bogavat (1969) reported
that the plant P. corylifolia was able to support
the complete development of P. demoleus. Similar
studies in laboratory were also conducted in
Japan (Honda, 1981). Joshi et al. (1992) reported
that the black to green co loured larvae of
P. demoleus Linn. denude the leaves of
P. corylifolia from July to September.

The incidence varies from 30 -100 per cent
that this insect damages foliage making lunate
cuts and feeds the leaves from margins towards
center.

The present study on the biology of
P. demoleus was carried out in the Department
of Entomology and Apiculture of Dr YS Parmar
University of Horticulture and Forestry, Nauni,
Solan (HP). The mean monthly lab temperature
for the month of April to September works out to
be nearly 22°C with mean relative humidity of
60 per cent.
Mated females from the field were brought to the laboratory and kept in insect breeding cages. The freshly laid eggs along with the host plant parts were kept separately in marked petri plates, on moistened pieces of filter paper to avoid desiccation. Date of egg laying and hatching was noted down for each egg separately to find out the incubation period of egg stage.

Newly emerged larvae were placed on a double layer of filter paper, in petri plates. The larvae were given fresh leaves of their host plant. Their behavioral changes, time of each moult and colour changes were observed. Date of moulting was recorded for each larva separately. Full-fed larva was carefully watched. The period when it stopped feeding, contracted in size and appendages were oppressed against body, till the formation of pupa was considered as pre-pupal period. The period from the formation of pupa till the emergence of adult was taken as pupal period. Date of emergence was recorded for each adult corresponding to the respective larvae studied. On emergence, the pair of adults was placed in insect breeding cage for egg laying. Besides fresh host plant shoots and flowers, adults were also provided with cotton wick soaked in 10 per cent sugar solution for feeding. Period between emergence of adults unto their death was recorded as longevity of the adults.

Identification of adults was confirmed by comparing with the type specimen at Forest Research Institute, Dehra Dun after preliminary identification in the department.

The results of the present study are as follows:

The butterfly laid eggs singly on underside of tender leaves of young plants. The eggs were yellow, round shaped and had smooth surface. The average incubation period was 2.8 ± 0.27 days. On hatching, the young larvae first ate the empty egg shell and later they started feeding on leaves. The young larva was brown having irregular white patches, resembling bird’s droppings. It remained brown during the first four instars. The fifth instar was green in colour. If disturbed, a forked (Y-shaped) orange process known as osmeterium, shot out for a few seconds behind the head emanating a distinct puff of foul smell. Larvae ate the exuviae after each moulting and only head capsules were found remaining in the Petri plates. Duration of I, II, III, IV nd V instar larvae was 3-4, 3, 2, 3 and 5 days, respectively. Thus, average larval duration was 16.4 ± 0.54 days. In a similar study, Pandey and Bogawat (1969) have reported a larval period of 17 days.

Pupation was preceded by a pre-pupal stage of 24 hours, during which it stopped feeding and the body shrunken in size. Pupa was attached to the substratum with the help of silken threads. The posterior end was attached to the surface while the head was suspended downwards. The colour of pupa varied from yellowish green to light brown. The average pupal period was of 9.7 ± 0.27 duration. However, in an earlier studies Pandey and Bogawat (1969) have reported a pupation period of 7.5 days.

Adult butterfly was a black and yellow swallow tail butterfly. The ground colour of wings was black, with irregular yellow spots and patches. The hind wing had an apical black and blue oval spot and a red spot towards the inner margin at the posterior end. The adult longevity was of 3-4 days.

Thus, it can be concluded that the egg, larval, prepupal, pupal and adult duration was of 3, 16-17, 1, 10 and 3-4 days, respectively. The colour of pupa varied from yellowish green to light brown. In a laboratory study in Japan, Honda (1981) reported that the pupal colour was likely to be determined by a reciprocal balance of intensity of environmental stimuli experienced by pupating larvae. In present study, oviposition did not take place in the captivity, however, all the stages developed successfully on this plant. Pandey and Bogawat (1969) have also reported that Psoralea corylifolia supports all the stages.
of *P. demoleus*. However, growth index value of *P. demoleus* was lower in *Psoralea corylifolia* as compared to lemon.

**REFERENCES**


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