



## Biology and Predatory Potential of *Coranus sp* on Diamondback Moth, *Plutella xylostella* (L.)

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### ABSTRACT

Biology and predatory potential of *Coranus sp* on diamondback moth was studied under laboratory conditions. The egg and five nymphal instars duration of *Coranus sp* was 6.64, 5.3, 4.94, 6.43, 6.23 and 9.7 days, respectively. Adult male and female longevity was 57.43 and 96.86 days, respectively. Fecundity was 156.14 eggs. A mean of 5.4, 7.25, 9.35, 11.5, 12.85 and 12.93 larvae were consumed per day by first, second, third, fourth, fifth instar nymph and adult, respectively.

**Key words :** *Coranus sp*, Diamondback Moth and Predatory

Diamondback moth is a serious pest of all crucifers. The larvae feed on the foliage from seedling to harvest stage, reducing both yield and quality of produce. Because of indiscriminate use of insecticides, it has developed resistance to all groups of insecticides (Sannaveerappanavar, 1995). Hence integrated pest management practices have to be adopted in which biological control plays an important role. With regard to the biological control of diamondback moth (DBM) most of the work has been done on parasitoids and pathogens. Hence a Reduviid bug, *Coranus sp* found in a cabbage field during survey in Tindlu village near G K V K, Bengaluru was studied for its feeding potential.

### MATERIAL AND METHODS

The procedure developed by Liu and Sun (1984) for rearing DBM was followed. *Corcyra cephalonica* culture was maintained on broken jowar grains in wooden boxes (45x30x15cm). One month after charging the box with *Corcyra* eggs, final instar larvae were collected by gently rubbing the broken jowar between hands. These larvae were utilized to prepare larval cards as described by Lakkundi and Parshad (1987). The predator was reared on the *Corcyra* larval cards in plastic vials (5.7 x 4.1cm).

A pair of newly emerged male and female bugs were released into a plastic vial containing *Corcyra* larval cards to study the biology of the predator. Observations were taken once in 6 hr to record pre-oviposition, oviposition, post-oviposition periods and fecundity. Eggs laid were collected and maintained on DBM separately in plastic vials. Eggs hatched and nymphs were also maintained on DBM till their death. Ten replications were maintained. Incubation

period, duration of each nymphal instar and adult longevity was recorded.

To study the predatory potential, one newly hatched first instar nymphal stage of the predator was kept in a vial containing known number of first instar DBM larvae. The number of larvae consumed after 24 hr was recorded. Again known number of first instar larvae were fed to the predator and this continued till the death of the adult predator. Five replications were maintained. Similarly another predator from hatching to death was fed with second instar DBM larvae. Likewise it was carried out using third instar and fourth instar DBM larvae.

### RESULTS AND DISCUSSION

It is evident from the Table 1 that on an average the egg period of *Coranus sp* was found to be 6.64 days. The nymphal duration of first to fifth instars was 5.30, 4.94, 6.43, 6.23 and 9.70 days, respectively. Total nymphal duration was 32.60 days with a range of 22.80 to 41.60 days. The eggs were laid individually, and they were brownish coloured and cylindrical in shape. The mean adult male and female longevity was observed to be 57.43 days and 96.86 days. Pre-oviposition, oviposition and post-oviposition periods were found to be 16.00, 59.86 and 21.00 days. Fecundity was 156.14 eggs during its life period. The present findings are in comparison to that of Lakkundi (1989) on *Corcyra cephalonica* larvae.

Predatory potential of *Coranus sp* on different instar larvae of DBM is presented in the Table 2. The number of first instar DBM larvae consumed per day by five nymphal instars of the predator and adult were 11.4, 12.8, 18.0, 21.4, 24.0 and 24.4.

Table 1. Biology of *Coranus sp.* on diamondback moth

Life stages of <i>Coranus sp.</i>	Duration(days)	
	Mean $\pm$ SD	Range
Egg	6.64 $\pm$ 0.32	6.2-7.3
Nymph		
Instar I	5.30 $\pm$ 1.26	3.5-7.7
Instar II	4.94 $\pm$ 0.70	3.8-7.7
Instar III	6.43 $\pm$ 1.22	4.2-8.1
Instar IV	6.23 $\pm$ 1.22	4.1-8.4
Instar V	9.70 $\pm$ 1.19	7.2-11.2
Adult		
Female	96.86 $\pm$ 4.79	90.0-104.0
Male	57.43 $\pm$ 7.96	48.0-69.0
Pre-oviposition	16.00 $\pm$ 4.40	10.0-23.0
Oviposition	59.86 $\pm$ 5.11	55.0-71.0
Post-oviposition	21.00 $\pm$ 4.60	18.0-25.0
Fecundity	156.14 $\pm$ 11.57	142.0-173.0

Table 2: Predatory potential of *Coranus sp* on diamondback moth

Stages of reduvid bug	No of diamondback moth larvae consumed per day $\pm$ S.D				
	Larval instars				
	I	II	III	IV	Mean
Nymph					
Instar I	11.4 $\pm$ 1.02	8.2 $\pm$ 0.75	1.8 $\pm$ 0.40	0.2 $\pm$ 0.49	5.40
Instar II	12.8 $\pm$ 0.75	11.4 $\pm$ 0.75	3.0 $\pm$ 0.63	1.4 $\pm$ 0.49	7.25
Instar III	18.0 $\pm$ 1.10	11.8 $\pm$ 1.02	4.6 $\pm$ 0.80	3.4 $\pm$ 0.49	9.35
Instar IV	21.4 $\pm$ 1.02	13.6 $\pm$ 1.02	5.8 $\pm$ 0.75	5.2 $\pm$ 0.75	11.50
Instar V	24.0 $\pm$ 0.63	14.4 $\pm$ 1.02	7.0 $\pm$ 0.89	6.0 $\pm$ 0.63	12.85

The number of second instar DBM larvae consumed by the six different stages of predator were 8.2, 11.4, 11.8, 13.6, 14.4 and 15.0. The number of third instar DBM larvae consumed by first to fifth instar nymph and adult predator were 1.8, 3.0, 4.6, 5.8, 7.0 and 7.4. The mean number of fourth instar larvae consumed by the six stages of predator per day were 0.6, 1.4, 3.4, 5.2, 6.0 and 6.2.

A mean of 5.5 DBM larvae were consumed per day by first instar predator i.e., 28.62 larvae were required to complete first instar. Second instar nymph consumed mean of 7.25 larvae per day and 35.53 larvae during the entire instar. The mean number of larvae consumed by third, fourth and fifth instar was 9.35, 11.50 and 12.85 per day and 59.84,

71.65 and 124.65 larvae for entire instar period.

Adult predator consumed maximum number of larvae compared to nymphs. More number of first instar DBM larvae were consumed by particular instar of the predator compared to fourth instar DBM larvae. In few cases the first instar predator could not feed on final instar DBM larvae. Arali (1993) reported that a reduvid bug, *Rhinocoris fuscipes* Fabr. can be released in starved late instar nymphal stage or adult stage because of their high feeding potential against *Helicoverpa armigera* Hub.

Hence, scope of releasing *Coranus sp* in the field can be worked out to control diamondback moth.

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