Rec. zool. Surv. India : **107**(Part–1) : 119-123, 2007

LIFE HISTORY OF THE COMMON INDIAN CROW *EUPLOEA CORE* (CRAMER) (NYMPHALIDAE : LEPIDOPTERA : INSECTA)

AVTAR KAUR SIDHU, MANBEER KAUR* AND H.S. ROSE*

Zoological Survey of India, M-Block, New Alipore, Kolkata-700 053, India

**Department of Zoology, Punjabi University, Patiala-147 002, India*

INTRODUCTION

The genus *Euploea* Fabricius is represented by eighteen species in India and *E. core* Cramer is one of them commonly available in North-West India (Varshney, 1993). Wynter-Blyth (1957), Sevastopulo (1973), Palot and Radhakrishnan (2001), and Palot *et al.* (2005) reported *Streblus asper, Ficus banghalensis, Ficus racemosa, Ficus arnittiana, Ficus elastica, Ficus religiosa* (Moraceae); *Holarrhena pubescens, Nerium odorum, Nerium oleander, Ichnocarpus frutescens* (Apocynacae); *Hemidesmes indicus, Cryptolepis elegans, Cryptolepis buchanani* (Asclepiadaceae) and *Ichnocarpus frutescens* (Linnaeus) (Apocynacae) as its food plants. The life history and behavioural aspects of this species have not been described in detail by any. During the course of the present study, the life history of the species *Euploea core* was recorded on *Ichnocarpus frutescens* (Linnaeus) (Apocynacae) in Shiwalik area of North-West India. *Ageratum conyzoides* Linnaeus, *Tagetes erecta* (Linnaeus) (Asteraceae) and *Alstonia scholaris* (Linnaeus) (Apocynacae) have been recorded as the nectar food plants of *E. core*. The detailed account of various life history stages and their behaviour is as below :

Methodology : The survey tours were conducted in different localities of the Shiwalik area around Chandigarh from 1999–2001 to collect immature stages of *Euploea core* (Cramer). The eggs and different larval instars brought from field were kept in circular transparent containers, each measuring (10 cm in diameter and 4.5 cm deep). Subsequently, the later instars were shifted to relatively larger transparent containers (12 × 7 cm, 15 × 20 cm and 18 × 23 cm) furnished with fresh clippings of the food plants. The mature larvae nearing pupation were then shifted to still bigger rearing containers (18.5 cm in diameter and 12.5 cm deep) for pupation. The freshly emerged adults were transferred to the insect breeding cages of varied sizes or to insectary (180 × 180 × 180 cm) furnished with an artificial diet consisting of 10% sugar solution to record their longevity.

The rearing boxes were carefully examined twice a day in order to make observations on different life history aspects. The rearing boxes were cleaned at regular intervals by removing the faecal matter, dead insect stages and waste host food plant clippings etc. for keeping proper hygienic conditions. The fresh host plant cuttings were provided to the larvae for their proper development and also to minimize the mortality rate due to starvation *etc.* The gross morphology, colouration and measurements of the egg, different larval instars and the pupae were recorded with the help of occulometer, taking a mean of 05 specimens of each stage.

OBSERVATIONS

Egg : Incubation period : 2.16 0.76 days.

Height 1.50 ± 0.14 mm, width 1.00 ± 0.14 mm; laid singly; melon-shaped, broader in middle, narrower on either pole; off-white in colour, turns grayish one day before hatching; chorion furnished with polygonal pits, ribs very low; eggs firmly glued to unopened flower buds of the inflorescence of the host plant on which it is laid.

Larva : Number of instars : 5.

Larval duration : 14.65 ± 2.70 days.

First instar : Duration : 2.33 ± 0.57 days.

Head : Width 0.63 ± 0.05 mm; hypognathus, black; epicranial suture black, clear; primary setae present.

Body : Length 4.33 ± 1.75 mm, width 0.86 ± 0.11 mm; newly hatched larva creamy white, later changes to dirty yellow colour; body well segmented, each segment further divided into annuli, but latter not very distinct; legs and anal segment blackish brown; mesothorax, second and eighth abdominal segments with a pair of rudimentary filaments, the latter black and somewhat fleshy, present ad-dorsally.

Second instar : Duration : 2.33 ± 0.57 days.

Head : Width : 1.03 ± 0.05 mm; other features same as explained above.

Body : Length 7.83 ± 1.89 mm, width 1.93 ± 0.11 mm; yellowish brown, thoracic segments with purplish tinge; four pairs of fleshy filaments (explained above) become longer; thoracic shield gets divided into two lobes; white transverse bands representing annuli appear on each segment.

Third instar : Duration : 2.00 ± 1.00 days.

Head : Width 1.55 ± 0.13 mm; black; vertex with a white band, the latter extending downwards, running through the parietals, ending at genal area; antennae, clypeus and labrum white.

Body : Length 15.00 ± 1.00 mm, width 2.53 ± 0.05 mm; orange brown; each segment with five transverse bands, the latter white in colour; spiracles and legs black; prothoracic and last abdominal

segment orange, anal shield black; but for the prothorax and the tenth abdominal segment, lateral line present on each side; body below completely brown.

Fourth instar : Duration : 2.16 ± 0.28 days.

Head : Width 2.23 ± 0.05 mm; other features same as in the third instar.

Body : Length 22.33 ± 2.51 mm, width 3.33 ± 0.57 mm; brownish black, white transverse bands very prominent, alternating with black bands, prothorax and anal segment orangish yellow; lateral bands yellow, distinct, decorated with prominent, black, oval spiracles; subspiracular band white, conspicuous, extends from mesothorax to ninth abdominal segment on either side; base of prolegs lined yellow; fleshy filaments very large, brownish maroon, mesothorax with the longest pair, eighth abdominal segment with the shortest pair, metathorax and second abdominal segment with equal sized pairs.

Fifth instar (Fig. 1) **:** Duration : 5.83 ± 0.28 days.

Head : Width 3.45 ± 0.05 mm, other features same as in the third instar.

Body : Length 35.00 ± 5.00 mm, width 4.16 ± 0.28 mm; other features same as in the fourth instar.

Pupa : Duration : 7.33 ± 1.52 days.

Length 16.50 ± 0.70 mm, width 8.50 ± 0.70 mm; attached at anal end by cremaster, with head suspended downwards; somewhat pot-shaped, constricted in the metathoracic region; mesothorax and second abdominal segment very long; the abdominal segments caudad of wings taper abruptly towards caudal end forming a hemispherical structure; cremaster black, narrow, broad at base; body shows a spectrum of dazzling and reflective colours. The freshly formed pupa very soft, grayish pink, flesh-like in appearance; after 2–3 hours becomes harder, glossy and glistening silver bands with golden tinge appear subsequently. A middorsal silver band extends from first to last abdominal segment but missing on second abdominal segment, subdorsal silver band present in mesothorax, and then in third abdominal segment extending up to last abdominal segment, in mesothorax this band bears three black spots while in abdominal segments it possesses a pair of black spots, in third abdominal segment these spots raised on tubercles; ocular region, base, costa, termen and dorsum of wing cases silver patched with reflective golden tinge (Fig. 2). The colour of pupa changes drastically and dramatically a day before eclosion, the abdominal segments become brownish, wooden-coloured and non-reflective, the remaining pupal body becomes blackish but reveals a mixture of variety of colours when rotated, the thorax reflects green colour, the ocular region blue, and the alar region violet shaded (Fig. 3). The advanced pupa turns more blackish and spectrum of colours go on shrinking with passage of time until it reduces into small spots in middle of wing cases; before eclosion the pupa becomes totally black but for the abdominal segments; white spots on wing of imago visible through the pupal case.

Oviposition behaviour : The oviposition sequences of *E. core* have been studied in the field at Nalagarh, Morni Hills (Chandigarh), Kalka and Parwanoo areas falling in Shiwalik range of North-West India on the host plant *Ichnocarpus frutescens* (Fig. 4), a climber. Oviposition occurs during the months of September and October between 11-30 am and 2-00 pm in good sunshine. Prior to egg laying, the female with slow flapping of wings sails for long distances in search of the appropriate host plant. In case of *Ichnocarpus frutescens*, the unopened buds of an inflorescence are preferred for oviposition. On locating the appropriate inflorescence as an egg laying substratum, the female alights on the same by holding the peduncle with her legs, and immediately curls her abdomen downwards to deposit an egg on an unopened bud. In rare instances, it has also been observed that a female may lay an egg on undersurface of the leaf.

Larval behaviour : The newly hatched larva depends upon egg chorion as first food. After consuming it completely, it takes rest for a while before switching to feed on the same very flower bud on which the egg was deposited. As an external feeder, the larva initiates feeding on the bud at its apex, proceeding slowly downwards, eating the whole flower except its thalamus, thereafter switching over to the next bud. Different instars follow the same feeding pattern. However, the fourth and fifth instar larvae may occasionally feed on the leaves of the host plant as well. In some cases, especially when there is scarcity of unopened buds, the earlier instars have also been observed to feed on tender leaves instead of blooming flowers. The first instar is highly cryptic in appearance with the flower buds.

Remarks : The species under reference, *Euploea core* is quite abundant during the months from August to November. The adults of *E. core* (Fig. 5) acting as model for the nymphalid species, *Hypolimnas bolina* (Linnaeus) is an example for Batesian mimicry (Wynter-Blyth, 1957; Eliot, 1992). The adults are slow flyers and congregate in large numbers on *Ageratum conyzoides*. The males also indulge in mud-puddling in ploughed and watered fields as observed in Sukhna lake at 12-30 pm and Morni hills, near Chandigarh at 11-30 am. The males assemble in numbers of 3–8 on these puddles.

ACKNOWLEDGEMENTS

The authors are thankful to the Head of the Zoology Department for providing facilities to carry out the present studies.

REFERENCES

Eliot, J.N. (1992). The Butterflies of the Malay Peninsula by A. Steven Corbet and H. M. Pendlebury. 4th Edition. *Malay Nat. Soc.* : viii + 595 pp, 69 pls.

Palot, J.M., Balakrishnan, V.C. and Radhakrishnan, C. (2005). *Mimusops elengi* Linnaeus (Sapotaceae), a new larval food plant of *Euploea core* (Cramer) (Lepidoptera : Nymphalidae). *Zoos'print Journal*, **20**(9) : 1985.

Palot, J.M. and Radhakrishnan, C. (2001). New larval food plants of *Euploea core core* (Cramer) (Nymphalidae : Lepidoptera : Insecta). *Zoos'print Journal*, **16**(10) : 614.

Sevastopulo, D.G. 1973. The food-plants of Indian Rhopalocera. *J. Bombay nat. Hist. Soc.*, **70**(1) : 156-183.

Varshney, R.K. 1993. Index Rhopalocera Indica Part III. Genera of Butterflies from India and neighbouring countries) Lepidoptera : (A) Papilionidae, Pieridae, and Danaidae). *Oriental Insects*. **27** : 347-372.

Wynter-Blyth, M.A. 1957. Butterflies of the Indian region. Today and Tomorrow's Printers and Publications, New Delhi : 523 pp.