

THE PUPA OF *POLYDORUS ARISTOLOCHIAE*  
(PAPILIONIDAE)

G. H. MUNSHI AND S. A. MOIZ

Agriculture College, Tando Jam, West Pakistan

*Polydorus aristolochiae* (Fabricius) is the commonest large-tailed, black butterfly of the Indo-Pakistan Subcontinent. At Tando Jam (25°26' N; 68°32' E) West Pakistan, the pupae were found on *Aristolochia bracteata* L., and other plants. The work was undertaken during the years 1961-63.

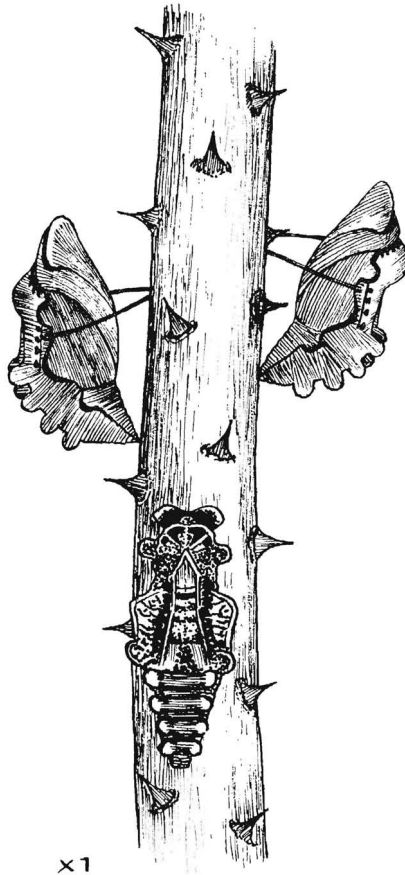
Some observations on the prepupal condition, pupation and description of pupa have been recorded by previous workers (Ghosh, 1914; Wynter-Blyth, 1957; and Talbot, 1939). This previous work has not been comprehensive, therefore, some additional observations on pupation of *P. aristolochiae* seem worthwhile. The results of our observations are discussed below.

RESULTS AND DISCUSSION

*Prepupal Condition.* When about to pupate the larva forms silken padding on the surface where the pupa will be situated. After fixing the prolegs of the anal segment to the pad, it forms a double silken loop around itself in the region of the thorax and then attaches the loops at one point to the substrate. Thus secured, the prepupa "rests" before pupation with the head directed upward and excretes a small quantity of semi-liquid substance. The prepupal period lasts for one or two days in summer and three to four days in winter. Finally the larval skin is cast off and the pupa is produced. These observations are in general agreement with Ghosh (1914).

*Pupation.* Normally the larvae pupate on the host plant, *A. bracteata* L. The full fed larvae were also observed moving towards larger bushes and trees where they subsequently pupated. This finding is in agreement with Ghosh (1941) and Wynter-Blyth (1957).

In addition to this, curiously enough, all the caterpillars were noted crawling in west and south-west directions only. This may be due to the fact that most of the higher winds at Tando Jam, are south-westerly. In one case, when the area in which the host plant grew were plowed, a few caterpillars were found pupating on the clods. This may be due to a chance occurrence. However, in most cases they find suitable twigs and sticks for pupation sites.



Pupae  
*Polydorus aristolochiae*

Larvae were found pupating on the following bushes and trees in the field.

Akk, *Calotropis procera* (Asclepiadaceae); Karandi, *Abutilon indicum* (Malvaceae); Kir, *Capparis aphylla* (Capparidaceae); Devi, *Prosopis spicigera* (Leguminosae); Ber, *Zizyobus rotundifolia* (Rhamnaceae); Mango, *Mangifera indica* (Anacardiaceae); Babul, *Acacia arabica* (Leguminosae); Wild jute, *Corchorus* spp., (Tiliaceae); Lasora, *Cordia*

*myxa* (Boraginaceae); Panghara, *Eytherina suberosa* (Leguminosae); Kachnar, *Bauhinia variegata* (Leguminosae).

As observed by Ghosh (1914), the larvae pupated on the sides of rearing jars and cages in the laboratory.

*Description of the Pupa.* The pupa is obtect. It is arched towards the ventral side, with the posterior end deflexed dorsally (Figure 1). There are a number of ridges and horns on the body of the pupa. On the dorsal surface, in the head region, there is a prolongation of the outer cover to form a transverse ridge. Anteriorly this prolongation forms a hood which by narrowing on the posterior side forms a triangular piece, the anterior angle of which comes out in the form of thin cephalic horns. A pair of thin horns are again developed in the prothoracic region.

The back of the pupa is raised into a ridge-like structure anteriorly which disappears in the region of the metathorax. The wing pads are expanded laterally. A pair of hood-like structures is formed by the wing pads of the forewings; while a pair of smaller semicircular prolongations are formed by the wing pads of the hindwings.

The pupa is deflexed posteriorly with a small depression near the posterior end to which is strongly attached a membranous cremaster.

On the ventral surface of the pupa, the cephalic horns are continued medially to form a continuous ridge. This is followed after some distance by a slightly wavy ridge which continues laterally to the prothoracic horns and finally meets in the middle to form the anterior border of the area enclosing the antennae and eyes. The prothoracic portion is raised and narrows down dorsally forming a tree-branched ridge which gives the appearance of an inverted 'U' with a tail at the base. The abdominal segments are brown in color speckled with dark spots which are surrounded by irregular white patches. Four pairs of spatulate structures are seen on third to sixth abdominal segments, with edges towards the anterior and distal ends. A pair of brown depressions is present on the posterior aspect of these spatulate horns, the outer depression being smaller and becoming very small on the horns of the sixth abdominal segment.

Another structure which keeps the pupa in position is a strong fibrous band secreted by the larva which passes all round the body, just below the thorax and meeting towards the substrate. A similar strong silken band is attached to the posterior end of the pupa, where it forms a strong fibrous pad. This description of the pupa agrees with that given by Talbot (1939).

The earlier writer did not mention the color of the pupa. The author's

observations with regards to color changes follow. The pupa is of light brown color with pinkish tinge immediately after pupation. Later, the color changes to light brown with markings of white and dark shades. The anterior portion comprising of the head, thorax, and wings is of a darker shade than the posterior portion. Prior to the emergence of the adult, the pupa become blackish.

#### ACKNOWLEDGMENTS

To Jerry A. Powell, University of California, Berkeley, I extend my sincere appreciation for critically editing, correcting, and improving the manuscript.

#### LITERATURE CITED

- GHOSH, C. C., 1914. Life histories of Indian insects. V. Lepidoptera. Mem. Dept. Agr. India, Entomol. Series 5(1):53-58.
- TALBOT, F. C., 1939. Fauna of British India. Vol. 1. Butterflies, Papilionidae. p. 61.
- WYNTER-BLYTH, M. A., 1957. The butterflies of the Indian Region (Papilionidae). Bombay Nat. Hist. Soc. pp. 365-375.

---

#### A MIGRATION OF *VANESSA CARDUI* (NYMPHALIDAE) IN OHIO

Several observers noted a great increase in the numbers of *Vanessa cardui* (Linnaeus) present throughout Ohio during the spring and summer of 1966. This abundance of *cardui* was quite noticeable in the upper Miami Valley. It was particularly noteworthy because it occurred after several years of relative scarcity.

A migration of *cardui* was observed in western Ohio from June 13 to June 19, 1966. The point of observance was at Minster, Auglaize County. The direction of the flight of the painted ladies was from southwest to northeast. The flight of individuals was rapid, aided during most of the migration by a wind from the southwest.

The week of June 13 to June 19 was abnormally warm, with the temperature reaching 102° on June 18. Below is a table of the maximum and minimum temperatures during the migration, at Minster.

	Max. Temp. °F	Min. Temp. °F
June 13 warm, showers	88	56
June 14 fair and warm	82	60
June 15 showers	74	52
June 16 fair and warm	80	58
June 17 fair and warm	102	50
June 18 fair and warm	94	50
June 19 fair and warm	98	50