

Immature stages of Plain Tiger, *Danaus chrysippus chrysippus* a rare butterfly of Andaman and Nicobar Islands (Insecta: Lepidoptera: Rhopalocera: Danaidae)

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Abstract: The plain Tiger *Danaus chrysippus chrysippus* (Linnaeus) (Insecta: Lepidoptera: Rhopalocera: Danaidae) is a widely distributed butterfly is rare in Andaman and Nicobar Islands. The scarcity of food plant *Calotropis* in the islands is the reason for rarity. The immature stages of the butterfly are discussed in the paper with some unusual observations such as laying of eggs in cluster and on the upper side of food plant, showing stress on survival of the fly.

Keywords: Andaman, Butterfly, Immature stages, Lepidoptera

INTRODUCTION

The Plain Tiger *Danaus chryippus chrysippus* (Linnaeus) (Insecta: Lepidoptera: Rhpalocera: Danaidae) is occurring in India, Pakistan, Afganistan, Sri Lanka, Bangladesh, Nepal, Bhutan and Myanmar (Tolbot, 1947). It also inhabits Andaman and Nicobar Islands and is rare in occurrence (Khatri, 1997). The Plain Tiger's recorded food plants are the members of family Asclepiadaceae – Milkweeds, e.g. *Asclepias curaresavica*, *Calotropis* sp.; *Caralluma* sp.; *Ceropegia* sp.; *Synanchum* sp.; *Frerea indica* and *Tylophora* sp. (Kahimker, 2008). Its main food plant in these islands is *Calotropis*. Two species of *Calotropis* are reported from Andamans. *C.gigantia* and *C. alba*. Mostly found in scattered patches in funeral or burial grounds. The present study was carried out to know the role of food plant in rare status of butterfly in Andamans and also to describe the immature stages of *Danas chryippus chrysippus* (Linnaeus) as very little work has been done on the immature stages of Andaman and Nicobar butterflies.

MATERIALS AND METHODS

The butterfly's immature stages were collected from burial ground of Phoenix Bay, Port Blair, capital city of Andaman and Nicobar Islands. The rearing was done, by well known standard method of butterfly rearing (Khatri, 2000), on *Calotropis gigantia* in the laboratory of J.N. Government College, Port Blair in November and December, 2009 by using the well known standard method of butterfly rearing (Khatri, 2000).

RESULTS

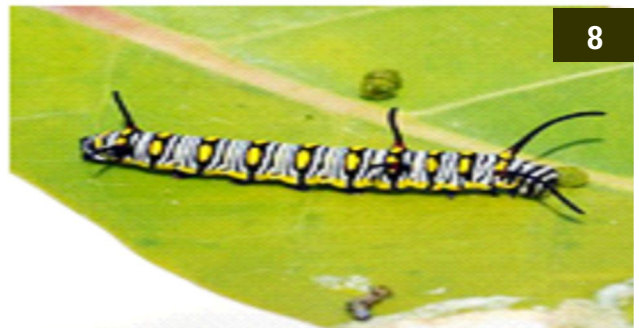
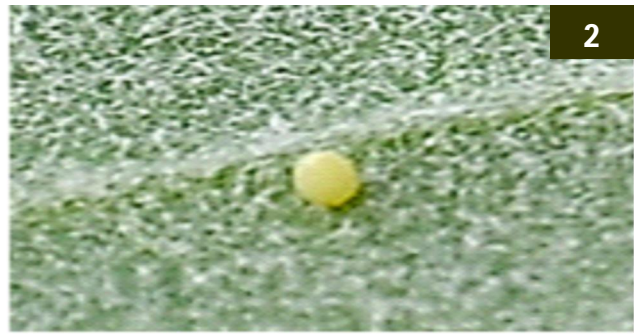
Egg: Sugarcane leaf shaped; cream colored, laid on the

underside of the food plant. The height of the egg was 4.0 mm and its breadth was 1.5 mm (Fig.2). The eggs were laid singly on the underside of the food plant. A cluster of eggs was observed on the underside of the leaf (Fig. 3). Some eggs were also collected from dorsal surface of the leaf (Fig. 4).

Hatching: The egg hatched after two days and its first meal was its own egg shell.

1st Instar larva: The larva was cylindrical, head black, body cream colored, clothed with sparse, short, erect black hairs, 9 dorsal yellow spots encircled by black. The 3 tentacles on 1st thoracic, 5th and 13th abdominal segments making their appearance in the form of dark spots. Legs and prolegs dirty cream colored bearing black hooks at the end. Anal segments with pincer like hooks for holding the larvae. The length of larva was 5.1 mm and breadth 1.0 mm (Fig. 5) . The larvae fed on soft surface tissues of the leaf during day time. After two days, the larvae changed into the next instar.

2nd Instar larva: The head of larva was black, marked with white, dorsal sparsely clothed black hair disappeared at this stage. Body black, only 2 tentacles were grown. 1st abdominal tentacle rudimentary, spiracular band yellow composed of contiguous molar teeth like spots, spiracles oval and black, a dorso-lateral row of large yellow spots which were absent on segment 2, 13 and 14. The marking were prominent than 1st instar larva. Between each pair of yellow spots, there were 3 or 4 white bands extending to the spiracular band of each side. There is no carmine spot at the base of tentacles on 6 and 12th. A yellow spot around the base of tentacle 6 and 12; segment 2 banded black and white. Legs and prolegs black. The later with a yellow band on their bases. The length of larva was 10 mm and breadth 1.5 mm (Fig. 6).



Figs.1-10. Immature stages of *Danaus chrysippus chrysippus* (Linnaeus). 1. Adult, 2. Egg, 3. Eggs in cluster, 4. Egg on upper side of leaf, 5. 1st Instar larva, 6. 2nd Instar larva, 7. 3rd Instar larva, 8. 4th Instar larva, 9. 5th Instar larva and 10. Pupa.

3rd Instar Larva: This larva was similar to previous stage except in size. The first tentacle is movable whereas 2nd and 3rd tentacles were immovable. It took 3 days to change the larvae to the next stage. The larva had grown in length up to 25 mm and in breadth 2.5 mm, the cirri of head was 4.0 mm that of middle 3.0 mm and last was only 2.0 mm (Fig. 7).

4th Instar larva : There was no difference in marking and structure of the larva than the earlier one except the size. The larva had grown up to 35 mm in length and 4.0 mm in breadth (Fig. 8). The length of 1st cirri was 7 mm, 2nd 3 mm and 3rd 2 mm. The larva fed on the margin of the leaf and continued to grow in size for 2 days then ecdysis for the last larval stage.

5th Instar larva: Similar to previous larva, the base of tentacle had developed a small carmine spot. This stage was feeding machine stage. The larva reached up to 40 mm in length and 7.0 mm in breadth (Fig. 9). The length of 1st cirri was 8.0 mm, 2nd 4.0 mm and 3rd 3.0 mm were black in color. After 2 days the larvae started for pupation.

Pupation : The larvae stopped feeding and searched for suitable object to pupate. Mostly, on the underside of the leaf or twig of the food plant. If reared in rearing box then on the wall or lid of rearing box. Usually the process started in the evening and the pupa was ready in the early morning. Head and thorax segments were discarded during pupation. The pupa hung from cremaster.

Pupa: The pupa was green; some wax white also, to match with the background of food plant leaves to protect it from predators like birds and reptiles. The ridge of segment 7 is composed of a double row of beads and was golden in front and black behind. Spiracles large but those on segment 2nd were mere slits. Head points gold, shoulder tipped with gold and a sub dorsal gold spot on hind margin of thorax. Cremaster short, narrow, oblong

with hooklets at extremity and with ventral extensor ridges; cremaster and extensor ridge was black. Length of pupa varied between 17.5 to 18.5 mm and breadth 8.5 mm (Fig. 10). The pupa hatched after 7 days early in the morning by breaking its pupal case. After drying its wings near empty pupal case for about an hour, the butterfly was on its wings to start a new life cycle (Fig. 1).

DISCUSSION

The early development stages of this butterfly were studied about hundred years back by Bell (1909). Most of the observations made in the present studies were similar to the study of Bell (1909). However, the laying of eggs on the dorsal surface of food plant and cluster of eggs are two new observations showing the butterfly under stress due to scarcity of its food plant in the islands.

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