

A PLAIN TIGER BUTTERFLY *DANAUS CHRYSIPPUS* (INSECTA: NYMPHALIDAE) WITH DYSFUNCTIONAL PROBOSCIS IN CAPTIVITY

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Abstract

A male of the Plain Tiger butterfly *Danaus chrysippus* (Linnaeus, 1758) (Lepidoptera: Nymphalidae) emerged from its pupa in captivity with its proboscis separated. Unlike other individuals, the separate halves of the proboscis were not appropriately assembled during its lifetime. The specimen survived for 10 days under controlled conditions. During these 10 days it was observed to be probing in an attempt to feed with both the separated halves of the disjointed proboscis on sugar solution.

Introduction

Adults of the Order Lepidoptera eclose with the two halves of the proboscis separated. These are appropriately assembled together soon after eclosion. There are observations on butterflies where the proboscis, which was split long after eclosion, was appropriately connected by the specimen independently (Pometto, 2014). However, in the specimen in question, reared by S. K. at his home at the above address, it was observed that not only did the two parts of the proboscis not join together, but the specimen tried using both the parts independently to feed on the offered sugar solution. Lehnert *et al.* (2014) noted that butterflies with previously split proboscides can retain the ability to feed. In the same study, they also observed that butterflies might be able to partly reassemble their proboscis when split. In the specimen under observation, the proboscis was never assembled during its lifetime.

Method

In a batch of *D. chrysippus* larvae being bred, one specimen eclosed with a damaged/weak left forewing and a split proboscis. Despite normal efforts by the butterfly, it was not able

to appropriately assemble the proboscis. This butterfly was kept under observation by S. K. for 10 days until it died a natural death. The observations are tabulated in table 1. The specimen was kept in a large cage with diagonally placed twigs to enable it to walk about and hang from at night.

Remarks

When attempting to feed, the butterfly would excitedly probe the sugar solution with the tip of half a proboscis. Apparently, it was unable to ingest any of the sugar, since on day 4 it collapsed during the night and weakened from then until its death on day 10. Given that *D. chrysippus* is a migratory insect, the active adult life of a healthy individual can be expected to be for several weeks at least. The observation in the table suggest that the male of *D. chrysippus* contains enough energy in the form of body fat carried over from the larval stage to fuel it actively for at least three days and thereafter, it can survive for seven days. Given that the butterfly observed was relatively inactive and therefore used less energy, it is likely that in an open environment, a healthy individual would feel the need to ingest food energy from an external source by

the third day after eclosion. Failing this, it would weaken until it died. It was also noted that the wings appeared to grow duller as the condition of the butterfly deteriorated. However, since this was not expected, the observation is subjective. This observation suggests that having a source of food available is important for adult butterflies to live longer and thrive.

Results

On all days the butterfly was found feeding on the sugar solution on the ear bud, by using both parts of the proboscis separately.

Discussion

Since we have not done a dye test to establish feeding, we are not able to conclude about the actual feeding. However by observation, the

butterfly did all the actions for feeding using either parts of its proboscis. The total life of the butterfly specimen was 10 days. It was informed by Mr Peter Smetacek (*pers comm.*) that the life span without food for a nymphalid is also around 10 days.

References

Lehnert, M.S., C.P. Mulvane & A. Brothers. 2014. Mouthpart separation does not impede butterfly feeding. *Arthropod Structure and Development* 43 (2): 97-102.

Pometto, S. 2014. Repair of the proboscis of brush-footed butterflies (Lepidoptera: Nymphalidae). *AllTheses*.1881.

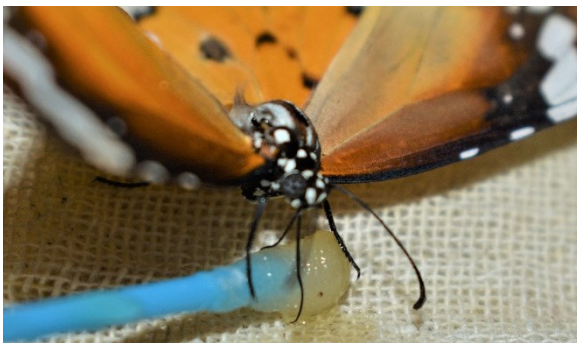
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1

Table 1: Observation Summary

Date	Day	Observations			Remarks	Notes if any
2020/06/		General	Wings	Proboscis		
01	1	Lethargic	Fresh and bright ground colour. Left forewing not fully expanded.	Separated	Not very active but attempted to feed.	Offered a cotton earbud soaked in 30% jaggery and sugar solution. Avoided use of proboscis. Instead, it climbed on the ear bud and stood on the part containing sugar solution.
02	2	Active	same as day 1	Separated	Active but did not attempt to feed as often as on day 1.	Placed a bowl of wet soil with some salt for mud puddling but it avoided that and started probing the sugary ear bud with its proboscis.
03	3	Active	Groundcolour became little duller.	Separated	Active, spent more time attempting to feed than on the previous day.	Same as day 1 and 2.

04	4	Active	same as day 3	Separated	Active, and attempted to feed for longer than on day 2.	Found in a weak condition at the bottom of its cage, lying upside down in the morning
05	5	Active	Dull wings	Separated	Active but spent less time attempting to feed.	Found at the bottom of its cage lying upside down in the morning.
06	6	Lethargic	Dull wings	Separated	Weak and spent more time attempting to feed than on day 2	Found at the bottom of the cage, lying upside down in the morning.
07	7	Active	Dull wings	Separated	Active and attempted to feed for longer than on day 2	Was settled on the twig in its cage in the morning, like a healthy butterfly. Avoided the sunny side of its cage.
08	8	Active	Dull wings	Separated	Active and spent longer attempting to feed than on day 2	Was settled on the twig in its cage in the morning, like a healthy butterfly. Avoided the sunny side of its cage.
09	9	Active	Dull wings	Separated	Active and spent longer attempting to feed than on day 2	Found at the bottom of the cage, lying upside down in the morning.
10	10	Active	Shrunken abdomen	Separated	Active in the morning, died in the afternoon.	Found at the bottom of the cage, lying upside down in the morning.

Fig.1: *Danaus chrysippus* proboscis separated