
A NOTE ON AGGRESSIVE MALE MATING BEHAVIOUR OF *PAPILIO MACHAON MELITENSIS* (LEPIDOPTERA: PAPILIONIDAE) ELLER, 1930

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ABSTRACT

In this short work two instances of aggressive mating behaviour are recorded for the first time in the Maltese islands and are compared to the usual mating behaviour observed. Analysis of the behaviour is carried out possibly shedding light on the use of morphological appearance and posture by the species.

Keywords: *Papilio machaon melitensis*, aggressive male mating behaviour, Lepidoptera, Maltese Islands.

INTRODUCTION

Cilia (1973) states that although he did not observe the behaviour directly, during mating, males of *Papilio machaon melitensis* chase females and on landing on bare rocky ground flutter and vibrate their wings. He also mentions in his observations that if a pair is disturbed, the female will carry away the male, unlike in Pieridae species. This behaviour was observed repeatedly by the present author in normal mating patterns but aggressiveness was only observed in other species of Lepidoptera.

This note is based on two interesting mating patterns that were observed, one at Golden Bay on 13/V/2008, and the other at Paradise Bay on 18.VI.2008. In the first event, that of 13/V/2008, a female specimen was feeding at around 10:40 am on the main species host plant *Foeniculum vulgare* Mill. (Sammut, 2000, Sciberras & Schembri, 2005, Sciberras 2007) flowers and continued to do so till 10:47 am. At this time, a male approached and started imposing the normal male behavioural patterns prior to mating. The male started circling in flight around the female keeping a distance of about 10 to 15 centimetres. This behaviour generally stimulates the female to take flight with the male accompanying her in vertical circling flights and after a couple of minutes the pair would settle facing opposite directions following attachment of genitalia and copulation. This behaviour was observed at least 13 times by the present author. On this occasion, however, the female neglected the male and flew very close to the ground and settled with wings held upright on sand with little vegetation.

The male continued his persistence with the same strategy and the female was repelled each time by this behaviour by always flying away from the latter. After this event repeated itself 5 times, the female settled on bare sand and started flapping its wings vigorously on the ground, not letting the male approach the same distance as before. This continued for several minutes until the male settled down on the ground and tried approaching the female from the front and touching the tips of his antennae with those of hers. As soon as he managed to do so, the female started to flatten her wings on the ground as much as possible (front wings not touching back ones) trying also to hide the tip of the abdomen by retracting it inwards under the left wing and exposing the red spots towards the head of the male.

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The male reacted by taking flight, started circling around the female and again dropping in front and repeating the same action (trying to touch her antennae with his). The female behaved as before and this procedure took 45 minutes. Upon observing the inefficacy of such an approach, the male flew in front of the female fluttering its wings and holding the same height. This allowed the tips of the tail of the hind wings to stay at the same level as the clubs of the antennae of the female. This position was held in mid-air for over two minutes, while keeping the wings expanded as possible from each other during flight. After this, on the same height, the male started shifting 90 degrees to the left, coming back to the front of the female and shifting the same position as before always facing an upward position to the right. After repeating this eight times, the male, holding the same posture, approached the female bending forward 90 degrees in mid flight and started hitting her antennae which were constantly facing upwards and then returned to the original position (facing upward flight). This was repeated five times till the female started to flutter its wings again. This behaviour was a signal to the male to fly on top her and drop ca. 15cm 3 times facing the head, until the female closed her wings upright allowing the male to take the normal copulation posture; connection of genitalia occurred less than 1 minute later.

The pair encountered at Paradise Bay on 18/VI/2008 performed identical behavioural patterns except that in the last part the female took 7 beatings from the male before it closed its wings.

DISCUSSION

Unfortunately no publications were found in order to compare and analyze this type of behaviour,.. The only comparable information available is that male specimens are territorial and patrol the area where they emerge in search of freshly emerged females to mate with them. Territory is always dependant on the population density, which limits this behaviour. Freshly emerged virgin females do not fly until they are approached by a male. It is not rare to see a pair flying in circles to a considerable height and then descend to settle on a branch and mate. This strategy favours selection of the fittest males and probably happens when there are a number of males patrolling. The female sometimes prefers not to be chased and mate immediately as the male approaches. This probably takes place when a smaller number of males are present (Aldo Catania, pers.comm.).

It is presumed that this behaviour took place because the female either was not ready for mating or had already copulated and was followed by a persistent male. The interesting feature is that the red spots/marking (which are located just before the 'tails' on the hind wings) together with the aggressive behaviour of the male, forced the female to accept the male, although it appeared that the female was not interested since it sent threatening signals to the male by expanding the wings, fluttering them and hiding the genitalia. It is well known that these colours and wing patterns are used as defence mechanisms to deter predators. They usually indicate that the species is either not palatable, poisonous or is mimicking other unpleasant species. Also to some predators these markings may appear to be eyes suggesting that the subject is much larger than it actually is.

These behaviour patterns may suggest that these markings are also intraspecific warning signs to repel or threaten other members of the species or to impose unwanted behaviour. The hitting of the antenna and the particular flight together with the aggressive descents are also threatening signals that may have compelled the female to give up and accept the advances of the male. It may also be pertinent to note that both cases happened on bare sand.

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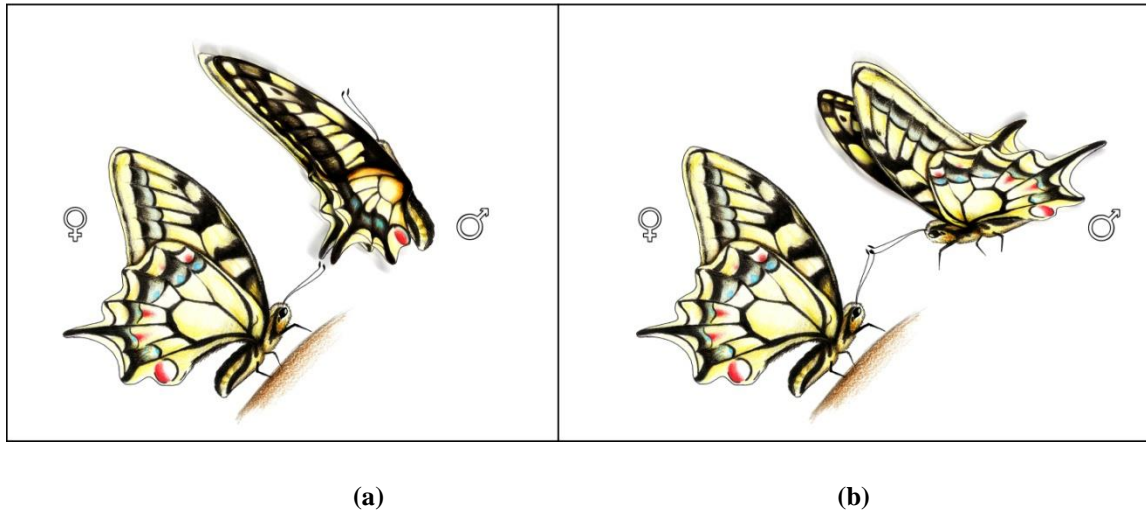


Fig. 1 (a): the male in flight position , staying upright in front of the female for 2 minutes and (b) the male in flight from position (a) shifting 90 degrees towards and hitting the female's antenna while still in flight (pictures by R.Cassar, 2008).

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