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## On the Biology of *Memphis pithyusa morena* (Lepidoptera: Nymphalidae) in Trinidad, West Indies

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## On the Biology of *Memphis pithyusa morena* (Lepidoptera: Nymphalidae) in Trinidad, West Indies

De Gannes (2011) reported an unusual outbreak of *Memphis pithyusa* (R. Felder) (Nymphalidae), the southern blue leaf shoemaker butterfly (Barcant 1970), at Point Gourde in August 2010. Examination of further material shows that the Trinidad population belongs to subspecies *Memphis pithyusa morena* (Hall), described from French Guiana and reported from the Amazon north to Mexico (Comstock 1961). De Gannes (2011) found the food plant at Point Gourde to be *Croton niveus* (Euphorbiaceae) and reared out many specimens.

On a return visit to Point Gourde, 16 October, 2011, the authors saw no adult *M. pithyusa*, and although several leaf rolls were found, all were empty except one. This one contained a final instar caterpillar, which is documented here.

The leaf roll shelter (Fig. 1) was made by making a cut from the edge of the leaf diagonally to close to the mid-rib. The distal flap of the leaf was rolled to make a tube, wider basally, but apparently open at the distal end. The edge of the leaf flap was attached to the upper surface of the leaf, edge on, with silk, so that the shelter was a single thickness, not a spiral. The shelter was thickly lined with white silk so that the distal, narrow end was closed, and the only access was through the basal end which was blocked by the head of the caterpillar within (Fig. 2).



**Fig. 1.** Leaf roll of *Memphis pithyusa morena* in situ, on *Croton niveus*, Point Gourde, 16 October, 2011, C. De Gannes and M.J.W. Cock, MJWC Ref. 11/42.

The final instar caterpillar is shown in Fig. 3. Those which CDG reared in 2010 were variable in the extent of the dorsal black markings on segment A2. In the 2011 individual, these are restricted to a pair of near circular



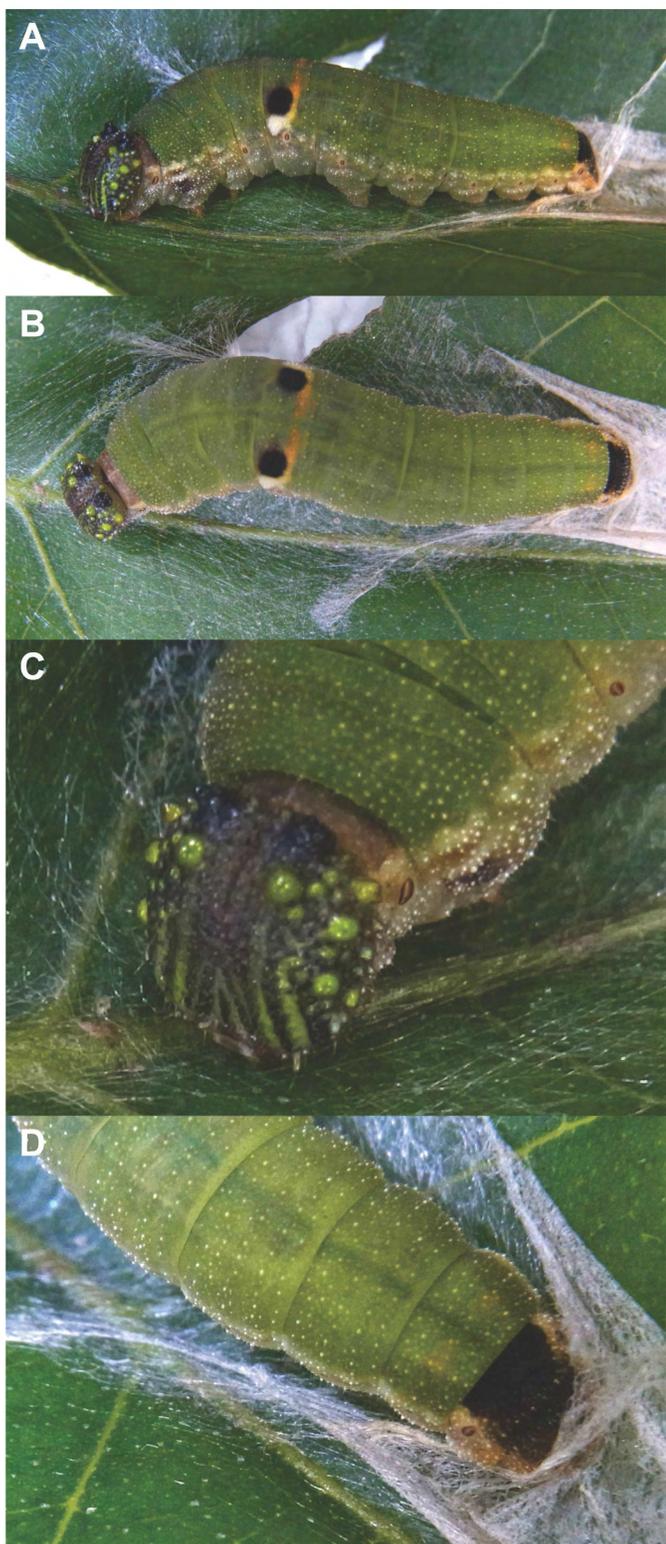
**Fig. 2.** Leaf roll of *Memphis pithyusa morena* viewed from the basal end showing caterpillar head blocking entrance (collection details as Fig. 1).

dorsolateral spots, but in the 2010 rearing in some cases, these spots were joined dorsally to form a black bar across the dorsal part of segment A2. The 2011 individual continued development for a further seven days until 22 October when it stopped feeding and prepared to pupate. However, for the next five days the caterpillar spent most of its time resting under the lid of the rearing container and excreted watery frass, and it was only on 27 October that it suspended itself from the container lid by the anal segment. CDG did not note this delay or watery frass in the material which he reared in 2010, so it is atypical.

Two days after suspending itself, the caterpillar pupated (Fig. 4), and 15 days later a male emerged (Fig. 5).

Barcant (1970) does not illustrate this species in colour, so we show here a pair of pinned adults (Fig. 6). The chestnut brown colouring on the upperside of female ssp. *morena* is characteristic, being light blue in ssp. *pithyusa*.

The caterpillar and pupa shown here (Figs. 3–4) are similar to those shown in black and white for *M. pithyusa pithyusa* from El Salvador by Muysshondt (1975). However, Muysshondt's photographs of the final instar caterpillar show that segment A2 has a broad black band running from the lateral white spot over the dorsum, as CDG noted for some Trinidad caterpillars in 2010. Muysshondt's final instar caterpillar also has dark shading laterally on segments T2–A1, A4–A8, which is not found in our cater-



**Fig. 3.** Final instar caterpillar of *Memphis pithyusa morena*, 28 mm (collection details as Fig. 1); note the silk lining of the shelter on which the caterpillar rests. **A.** dorsolateral view; **B.** dorsal view; **C.** anterodorsolateral view of head and anterior segments; **D.** posterodorsolateral view showing anal segment.

pillar. The photographs of *M. pithyusa pithyusa* in Janzen and Hallwachs (2011) show that the caterpillars in Costa



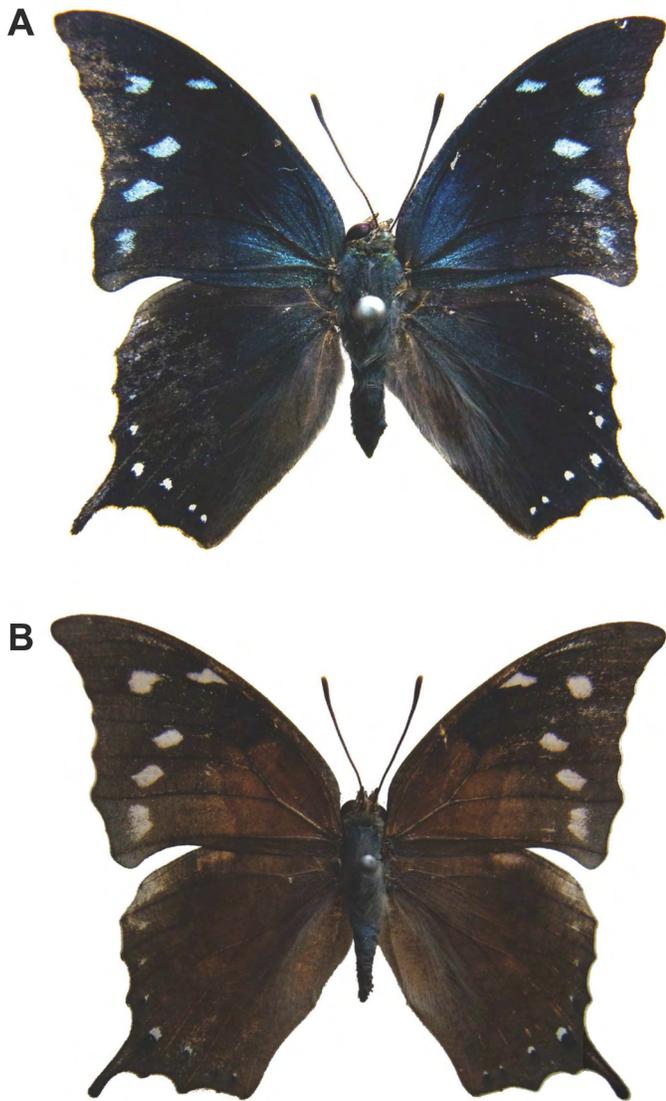
**Fig. 4.** Pupa of *Memphis pithyusa morena*, 11 mm, 30 Oct., 2011 (collection details as Fig. 1).



**Fig. 5.** Newly emerged adult male of *Memphis pithyusa morena*, 13 Nov., 2011 (collection details as Fig. 1).

Rica are similar to those from El Salvador, but variable with regard to the extent of these lateral markings, the colour of the tubercles on the head (some can be orange or red), the colour of the legs (varying to red in some individuals) and the extent of the black posterior marking.

In conclusion, there do not seem to be any significant differences between our observations of the early stages of *M. pithyusa morena* and those of *M. pithyusa pithyusa* from Central America, although observations



**Fig. 6.** Pinned adults of *Memphis pithyusa morena*. **A.** male, collection details as Fig. 1, 39 mm wingtip to wingtip; **B.** female, collected as caterpillar on *Croton niveus*, Point Gourde, 29 Aug., 2010, adult 2 Oct., 2010, C. De Gannes, 47 mm wingtip to wingtip (see De Gannes 2011).

of more individuals from Trinidad are needed to define the extent of variation in the caterpillars. Accordingly, the treatment of *morena* as a subspecies of *pithyusa* (Lamas 2004) is supported rather than treating *morena* as a separate valid species as Comstock (1961) did.

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