The life history of *Papilio hipponous rolandi* (Page & Treadaway, 2003) from Negros Island, Philippines

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Abstract: The immature stages of *Papilio hipponous rolandi* Page & Treadaway, 2003 are described and illustrated from Bago City, Negros Occidental, Negros Island, Philippines.

INTRODUCTION

The Hipponous Swallowtail, *Papilio hipponous* C. Felder & R. Felder, 1862, was described from specimens collected in Luzon and Mindanao, Philippines. The Treadaway and Schroeder (2012) checklist states that eight subspecies occur in the Philippines, listing the nominate subspecies from Luzon and Camiguin de Luzon. *Papilio h. bazilanus* Fruhstorfer, 1899 was described from Basilan and the Mindanao population has been included in this subspecies (Page & Treadaway, 2003b). Page & Treadaway (2003a) described six more taxa as subspecies within genus *Menelaides* Hübner, [1819] from other islands: *P. h. gamay* from Balabac and Palawan; *P. h. madil* from Busuanga; *P. h. daku* from Marinduque and Mindoro; *P. h. palpag* from Sanga Sanga, Sibutu, and Tawi Tawi; *P. h. lynn* from Cuyo Island; and *P. h. rolandi* from Panay, Negros, Bohol, Siquijor, and Cebu. Currently, *Menelaides* is considered to be a subgenus of *Papilio*, rather than a separate genus (Condamine *et al*., 2023). The related mainland Asian species, *Papilio prexaspes* C. Felder & R. Felder, 1865, is confined to lowlands and prefers open areas near forest, even near mangroves. The adult male of *Papilio hipponous* is similar to *Papilio alphenor ledebouria* Eschscholtz, 1821 but with spatulate tails and lacking the square white spots on the forewing margin. The female is non-mimetic, similar to the male but with an amorphous band curving from termen to costa on the forewing.

In Cebu Island, *P. hipponous* was last seen in 1964 and is probably extinct (Page & Treadaway, 2003b; Treadaway & Schroeder, 2012). The first photograph known to us of this species in the wild was taken by Arlene Halabaso from Nueva Ecija, Luzon in 2016, and another photograph of adults was taken by Albert Kang in Palawan in 2023. The first published photographs of the caterpillar were documented by Ae (1977) from an egg and a larva obtained at Bilar, Bohol island in August 1974, and other photographs were taken in Luzon by Andrea B. Agillon in 2020. Ae (1977) also cited Morishita (1969), who mentioned a rearing by Wada of *P. hipponous* in Mindanao. The biology and ecology of this species remains understudied due to its local distribution compared to other swallowtail butterflies in the country. This paper therefore describes and illustrates the life history of *Papilio hipponous rolandi* from Negros Island, Philippines.

Papilio hipponous rolandi **(**Page & Treadaway, 2003)

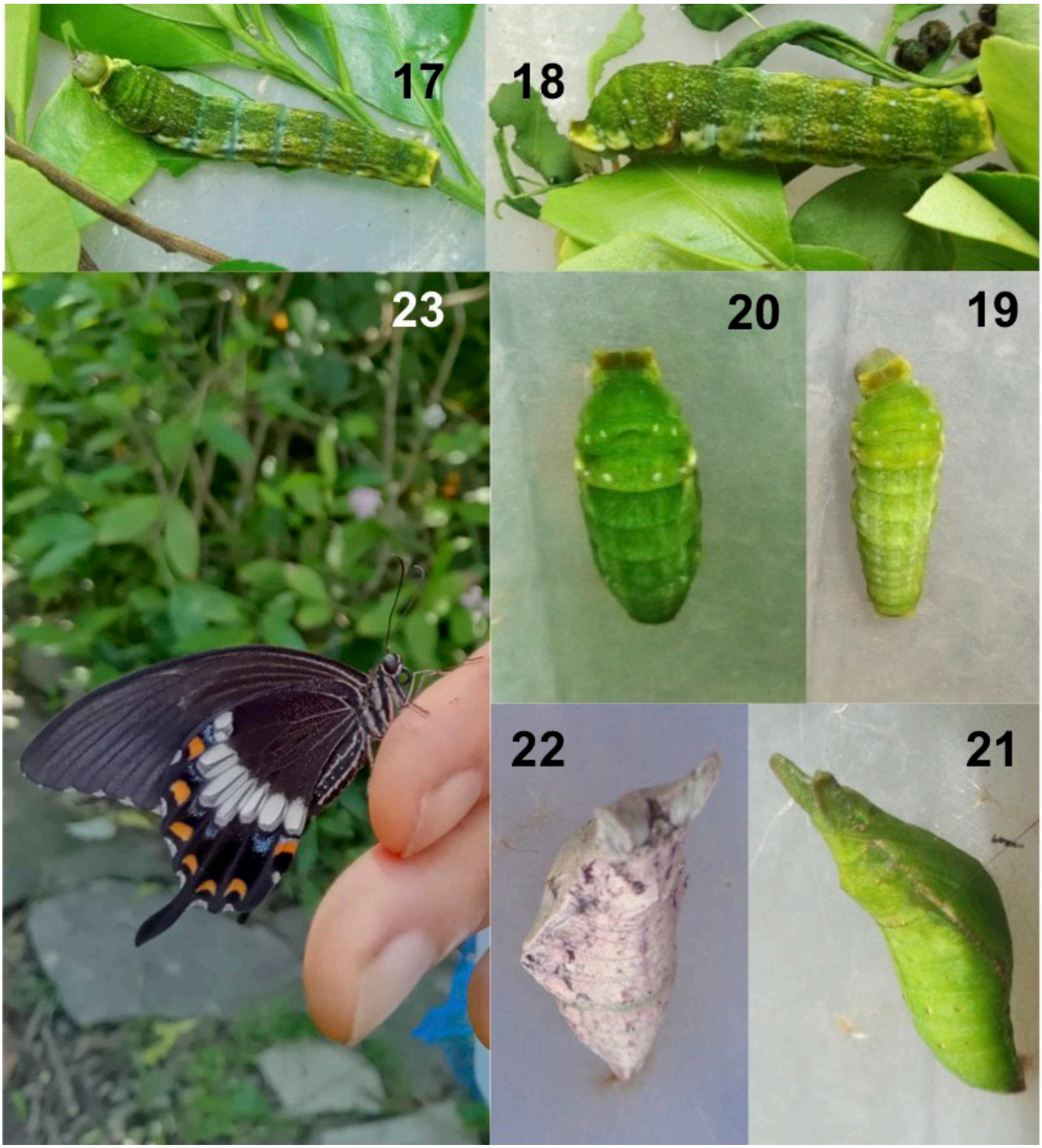
Egg. A female was observed ovipositing (Figure 1) on a *Citrus* (Rutaceae) plant on the morning of 10 June 2025; it flew away and returned to the garden in the afternoon of the same day and oviposited on a nearby *Citrus* plant. The egg (Figure 2) was circular and yellowish in color. Four eggs were collected, which were laid under the leaves, and placed inside a small plastic container with its cover having holes purposely made to provide air inside the container. The leaves of the hostplant were also placed in the container and were replaced regularly to maintain freshness. Furthermore, 4 eggs were documented in this observation, wherein the first egg to hatch was placed in a separate container for documentation, while the remaining 3 eggs were hatched and reared in the same container, however, the latter were not fully documented. The larvae were examined every early in the morning and afternoon and photographs were taken to document any changes such as molting. Duration: 4 days (n=1).

First instar larva. The first instar larva emerged (Figures 3-4) on 13 June 2025. It was white with a greenish part on the median region near the head. It had a pair of whitish horns on the head and 2 pairs on the anal region. The body was covered with tiny spines. Duration: 2 days (n=1).

Second instar larva. The second instar larva emerged (Figure 5-6) on 14 June 2025. It was more greenish with brown patches on the lateral region. Spines and horns could still be seen but the pair of horns near the anal region (just before the anal horns) were reduced. Duration: 3 days (n=1).

Third instar larva. The third instar larva emerged on 16 June 2025, the caterpillar (Figures 7-9) was now relatively larger with dark green-yellow composition and conspicuous white

Figures 1-15. Life history of *Papilio hipponous rolandi*. **Figure 1.** A female ovipositing. **Figure 2**. Ovum on a leaf under-surface. **Figure 3**. Early first instar larva. **Figure 4**. Late first instar larva. **Figures 5-6**. Second instar larva. **Figure 7**. Third instar larva. **Figure 8**. Early pre-molting of third instar. **Figure 9**. Late pre-molting of third instar. **Figure 10**. Newly emerged fourth instar larva , eating shed skin. **Figures 11-12**. Fourth instar larva. **Figure 13**. Preparation for molting to fifth instar. **Figures 14-16**. Early to late fifth-instar larva.



Figures 17-24. Life history of *Papilio hipponous rolandi*. **Figures 17-18**. Late fifth-instar larva. **Figure 19**. Preparation for pupation on a silken pad. **Figure 20**. Prepupa. **Figure 21**. Green pupa. **Figure 22**. Brown pupa (from a different larva). **Figure 23**. Emerged adult ♂.

bands on the head, median, and anal regions. White spines and horns were still present but reduced in size. On 20 June 2025, the caterpillar stayed in one place and its coloration became reddish before molting. Duration: 5 days (n=1).

Fourth instar larva. The fourth instar larva emerged (Figure 10-12) on 20 June 2025. It became reddish with white narrow bands on the segments. White spots on the dorsal region became prominent and the median white band had a large reddish band in the center. The head and anal end were yellowish and had tiny horns. It became more reddish on 21 June 2025, and reached a length of 3.5 cm. During this instar, the thoracic region became enlarged. Duration: 3 days (n=1).

Fifth instar larva. The fifth instar larva emerged on 22 June 2025 and the caterpillar (Figure 13) rested in one place. Its

coloration (Figures 14-15) became yellowish-greenish and the segments had greenish white narrow bands. The dorsal white spots were still visible, and the dorsal white bands became orange towards the anal region. The caterpillar (Figures 16-18) became greener in the afternoon and completely green on 23-24 June 2025, resembling like a zucchini or cucumber in terms of pattern. Duration: 4 days (n=1).

Prepupa. 25 June 2025. The caterpillar (Figures 19-20) stayed in one place and prepared for pupation by spinning a silk pad below its abdomen and a silk girdle holding its body in place just below the 3rd thoracic segment before becoming a prepupa. The caterpillar had turned green with pale bluish spots on the thoracic region and conspicuous tiny yellow patches on the lateral region. Duration: 2 days (n=1).

Pupal stage. 26 June 2025. The chrysalis (Figure 21) was green with horns on the head region, similar to the chrysalis of *Papilio alphenor* Cramer, 1776. Tiny brown spots were present in the dorsal region and pale brown spots on the edge of the wing cases. Another larva formed a wrinkly brown pupa with greenish-pink markings. An adult ♂ (Figure 23) emerged on 7 November 2025 after its chrysalis was sprayed with water once early in the morning every day beginning 6 October 2025. Duration: 135 days (n=1).

Habitat: Urban residential garden of the second author, built in 1997 and designed to look like a normal suburban garden.

Hostplant: *Citrus* sp. (Rutaceae) from Ae (1977), and in our observation the caterpillar fed on the leaves of *Citrus maxima* (syn. *Citrus grandis*) (Figure 24) which local people call Pomelo. *Papilio hipponous* may also feed on *Micromelum minutum* (Rutaceae), known locally in the Philippines as tulibas tilos or lunas kahoy.

Figure 24. The hostplant of *P. hipponous rolandi*, *Citrus maxima* (syn. *Citrus grandis*) (Rutaceae).

Figure 25. The co-author, Romana P. De Los Reyes, holding a freshly emerged adult of *P. hipponous*.

DISCUSSION

The documentation of the life history of this butterfly suggests that simple house gardens can support species diversity as well as serve as a refuge for enigmatic species such as *Papilio hipponous*, which is considered 'possibly extinct' on the nearby island of Cebu. Previously, 88 butterfly species were documented in the same private garden (Mape *et al.*, 2021) and more butterfly species have subsequently been recorded, making *Papilio hipponous* (Figure 25) the 93rd butterfly species to visit the garden. This total comprises at least 10% of the 927 species in the country, and 28% of the 325 species occurring in Negros Island (Treadaway & Schroeder, 2012). The Philippines still has gaps in knowledge of its butterfly distribution (Yau *et al.*, 2025), and as for the current known distribution of *P. hipponous* in the country, most recent recorded sightings were made by citizen scientists in 2016, 2020, 2023, and 2025. This species is rarely photographed or seen in the wild, and for conservation purposes its distribution and habitat preferences should be studied. According to Page and Treadaway (2003b), this species inhabits lowland to medium elevation primary and disturbed secondary forests. The life history of *P. hipponous* was documented at a lowland garden almost near the beach, and the closest disturbed secondary forest to primary forest is at Mt. Kanlaon, which is around 30 km from the garden. Ae (1977) obtained one egg from a female from Bohol Island (*P. h. rolandi*) which did not reach adult stage, and he found another caterpillar which pupated and emerged after two months. The caterpillar in this study pupated on 26 June 2025, and emerged after 135 days (7 November 2025). There is a possibility that

the rarity of the species may be influenced by the low number of eggs laid and extended chrysalis to adult stage development time (diapause), traits that may have also contributed to their potential status as 'extinct' for Cebu Island.

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