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*Pieriballia viardi* (Boisduval, 1836)

foto: U. Drechsel

# The early stages of *Idalus dorsalis* (Seitz, 1922) (Lepidoptera: Erebidae: Arctiini)

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**Abstract:** The immature stages of *Idalus dorsalis* (Seitz, 1922) of paraguayan origin are described. In the laboratory larvae were fed with leaves of *Psidium guajava* (Myrtaceae). Generation (oviposition to imago) lasted 45 days for females and 47 days for males. Ova, larval instars, cocoon, pupa and adults are illustrated.

**Resumen:** Se describen los estadios inmaduros de *Idalus dorsalis* (Seitz, 1922). En la naturaleza una hembra fue encontrada en Paraguay en el departamento de Alto Paraguay, que puso algunos huevos. En el laboratorio se alimentaron las larvas con hojas de *Psidium guajava* (Myrtaceae). Una generación (oviposición a imago) duró 45 días para hembras y 47 días para machos. Huevos, estadios larvales, capullo, pupa y adultos se ilustran.

**Zusammenfassung:** Die Entwicklungsstadien von *Idalus dorsalis* (Seitz, 1922) werden beschrieben. In freier Wildbahn wurde ein Weibchen im paraguayischen Departament von Alto Paraguay gefunden, welches einige Eier ablegte. Im Labor wurden die Larven mit Blättern von *Lactuca sativa* L. (Asteraceae) gefüttert. Eine Generation (Eiablage bis Imago) dauerte 45 Tage für Weibchen und 47 Tage für Männchen. Eier, Larven-stadien, Kokon, Puppe und Imagos werden abgebildet.

**Key words:** Paraguay, Erebidae, Arctiinae, early stages, *Idalus*.

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### Introduction

The genus *Idalus* Walker, 1855 is represented in the Neotropics with fifty-six described species (Vincent & Laguerre, 2014) and over ten still undescribed. At least nine of these taxa are also found in Paraguay: *I. flavicostalis* (Rothschild, 1935), *I. occidentalis* (Rothschild, 1909), *I. tybris* (Cramer [1776]), *I. carinosa* (Schaus, 1905), *I. dorsalis* (Seitz, 1922), *I. citrina* Druce, 1890, *I. larissa* Druce, 1890\*, *I. cf. daga* (Dognin, 1891) and one more species not yet identified (*Idalus* sp. 329 pictured in <http://www.pybio.org/5890/galeria-de-especies-arctiinae/>). All the hitherto known finds of *Idalus* species were made in the eastern region of Paraguay, from the Chaco there are so far no records. The species *I. dorsalis* presented here could be found in the departments of Kanindeyú, Alto Paraná and Caazapá (see map fig. 17). Whether the three *I. metacrinis* (Rothschild, 1909) specimens reported by Contreras Chialchia (2010) belong to this species or not must still be confirmed. As can be seen from the enclosed figure, it is likely to be *I. dorsalis*.

### Material and methods

The starting material for the breeding were ova originated from a female which was found in “Reserva Natural Dimas” (Drechsel 2014) in the department of Alto Paraná. Ova were transported to the laboratory and repeatedly sprayed with water until the hatching of larvae. Leaves of *Psidium guajava* (Myrtaceae) were offered as food and adopted without delay. Larvae developed under ambient conditions and were housed in ventilated plastic containers. Frass of the first eight instars was collected daily from the bottom of the rearing container to sort out the head capsules. Molts occurred almost simultaneously in nearly all larvae in all stages, a few specimens which retarded in their development were sorted out. Measurements of head capsules were taken with a binocular microscope with micrometric eyepiece. Voucher specimens of adult moths will be deposited in the *Museo Nacional de Historia Natural del Paraguay*.

### Immature stages

**Egg:** The translucent yellow hemispherical ova have a diameter of 0.9 mm and a height of 0.52 mm and are deposited individually. They are attached to the substrate with the flat side opposite to the micropyle (fig. 1).

**First instar:** First instar larvae hatched after six days since oviposition. Head, body and legs translucent yellowish white, only the dark filling of the intestine is visible through the body wall. Each segment has a transverse row of eight warts each of which carries two colorless bristles, such as

\* Recent barcoding implies (Laguerre 2016) that *Eupseudosoma larissa* (Druce, 1890) had to be transferred to the genus *Idalus*.

the length of the body diameter (fig. 2). Average width of head capsule 0.52 mm (n=6). Duration of the first instar four days.

**Second instar:** Head, legs and body completely yellow, on each wart 3 to 5 bristles, most colorless, some with black tips (fig. 3). Average width of head capsule 0.82 mm (n=6). Duration of the second instar four days.

**Third instar:** Head, legs and body orange-yellow, brown only the abdomen dorsally of segments 1 to 6. The bristles of the first two thoracic segments are black, longer than the others, and directed forward (fig. 4). Average width of head capsule 1.07 mm (n=6). Duration of the third instar three days.

**Fourth instar:** Head red, the first two thoracic segments, the last two abdominal segments, legs and bottom orange-red. The remaining segments are dorsally black-brown, warts are black, each occupied with up to 15 black bristles (fig. 5). Average width of head capsule 1.3 mm (n=6). Duration of the fourth instar three days.

**Fifth instar:** Head, first thoracic segment, legs and ventral side of the segments red. The remaining segments dorsally black-brown, warts violet-black, densely covered with black bristles (fig. 6). Average width of head capsule 1.85 mm (n=6). Duration of the fifth instar two days.

**Sixth instar:** Only the head, the legs and the ventral side of the segments red. The rest of the body black, warts blue-violet, densely covered with black bristles. (fig. 7). Average width of head capsule 2.1 mm (n=6). Duration of the sixth instar three days.

**Seventh instar:** Similar to the sixth except that the warts are black now and the body color turns to reddish brown (fig. 8). Average width of head capsule 2.85 mm (n=6). Duration of the seventh instar four days.

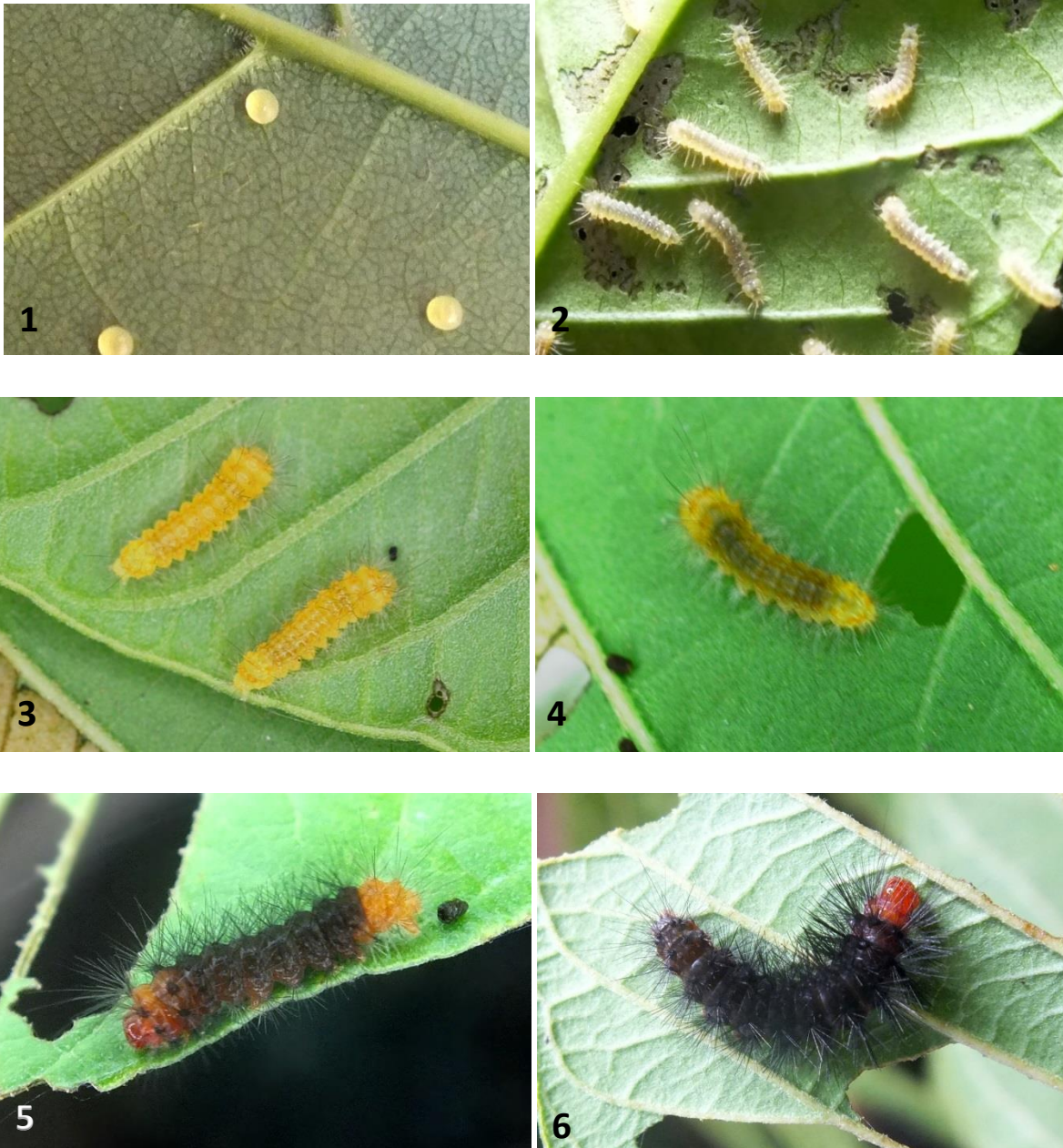
**Eighth instar:** A larger version of the former instar (fig. 9). Average width of head capsule 3.2 mm (n=6). Duration of the eighth instar three days.

**Ninth instar:** Similar to the eighth, head body and legs are now uniformly red (figs. 10,11). Average width of head capsule 4.05 mm (n=6). Duration of the ninth instar three days.

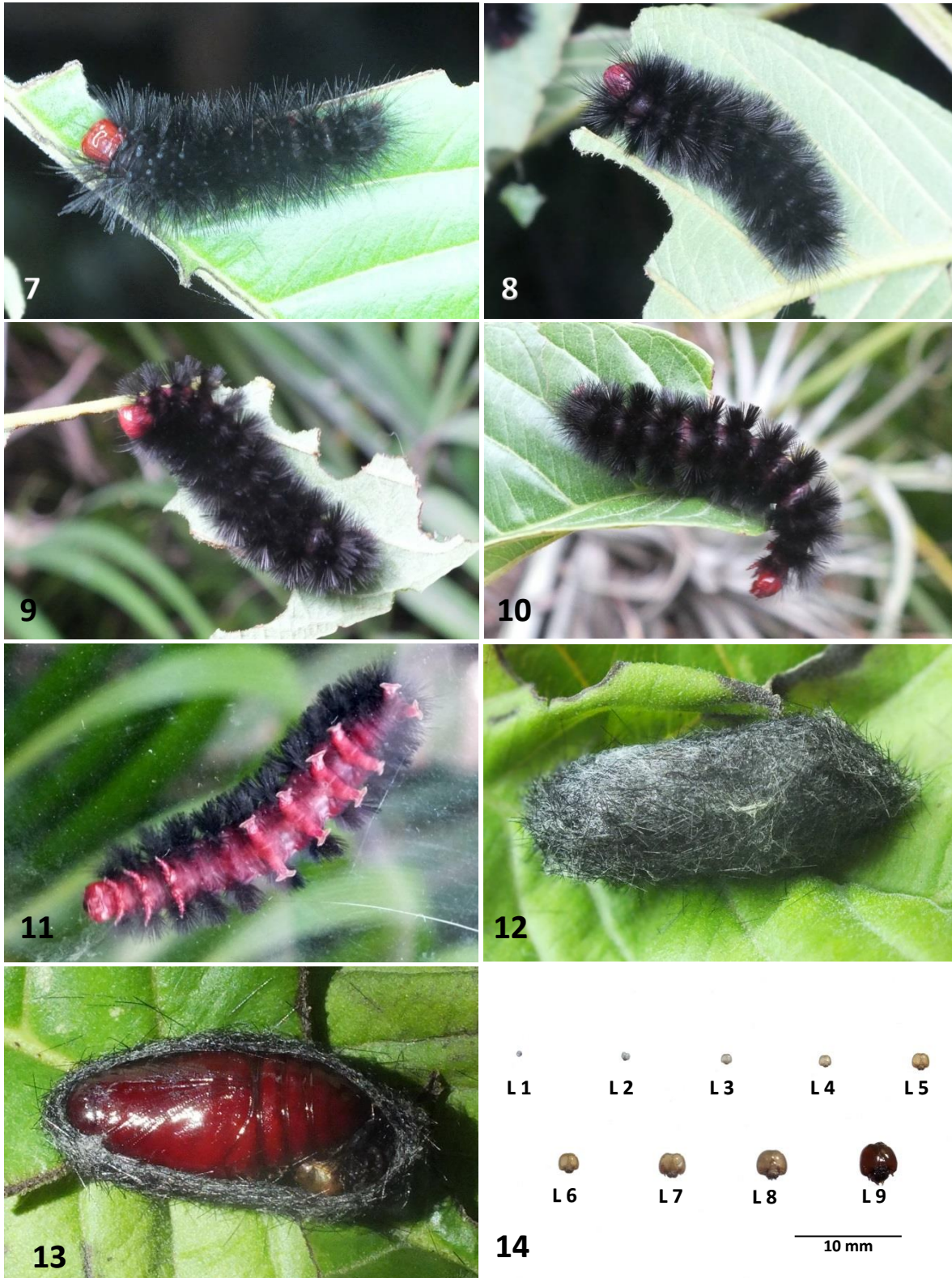
**Cocoon:** The cocoon is made of very thin and colorless silk threads not be seen with the naked eye. The black bristles of the caterpillar are woven into the outer layer and the cocoon appears black (figs. 12,13).

**Pupa:** The basic color of the pupa is maroon, abdominal spiracles and the dividing lines between the abdominal segments are dark brown (fig. 13).

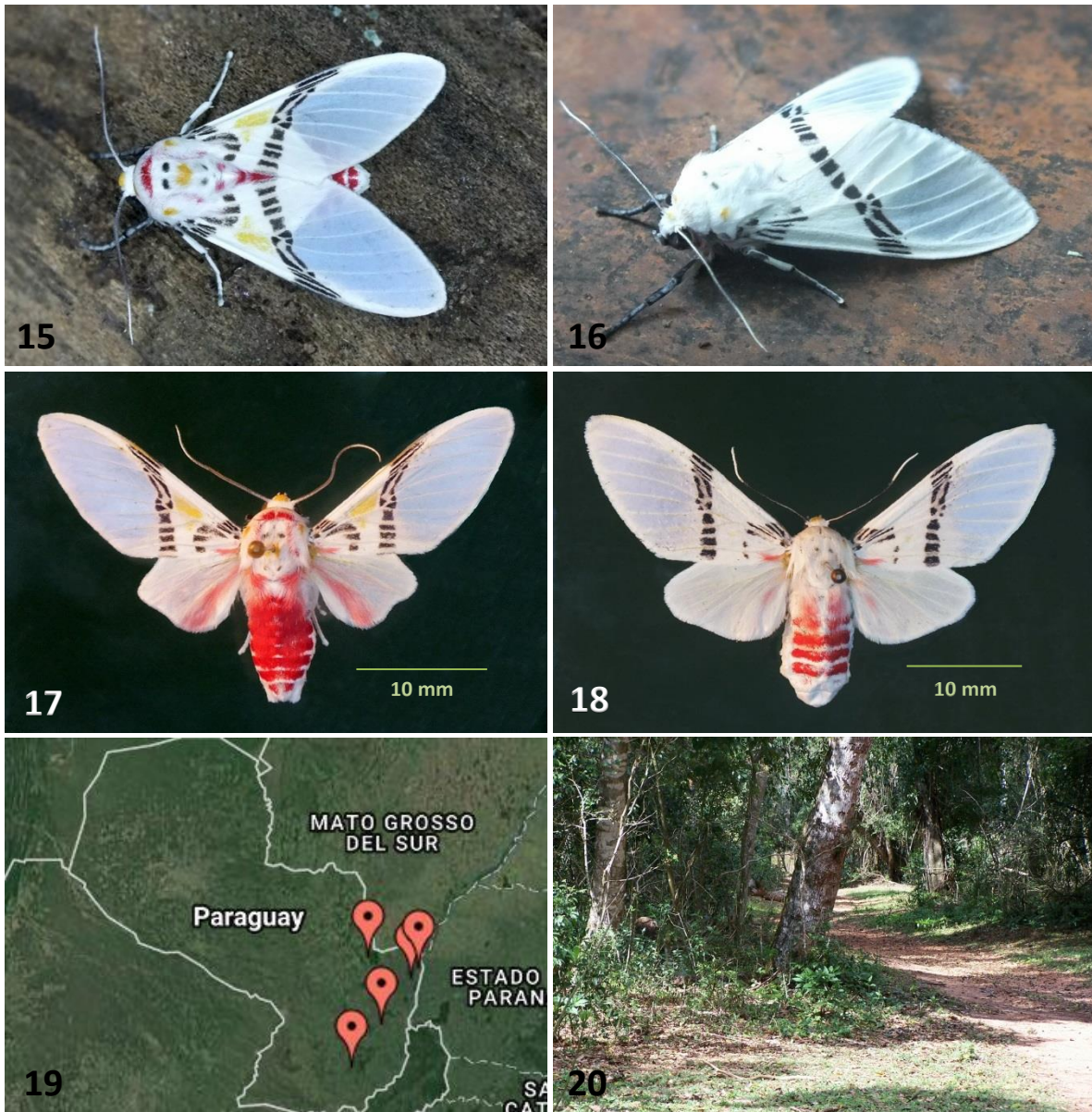
**Imago:** The first moths, a female (fig. 16) emerged after ten days since pupation, the first male (fig. 15) appeared one day later, together with other males and the remaining females.



Figs. 1-6: *Idalus dorsalis*; 1) ova; 2) first instar; 3) second instar; 4) third instar; 5) fourth instar; 6) fifth instar



Figs. 7-14: *I. dorsalis*; 7) sixth instar; 8) seventh instar; 9) eighth instar; 10) ninth instar; 11) ninth instar ventral; 12) cocoon; 13) pupa in the open cocoon; 14) head capsules of all nine instars



Figs. 15-20: *I. dorsalis*; 15,17) adult male (F1); 16,18) adult female (F1); 19) distribution in Paraguay; 20) habitat: a remain of the Atlantic Forest in “Reserva Natural Dimas”

### Discussion

First instar larvae feed only on the lower epidermis of the leaf (fig. 2), second instar larvae feed on upper and lower epidermis and third instar larvae were chewing holes in the leaf (fig. 4). The larvae of the first and second instar show a “bungee jumping” behavior (Silva et al. 2014) when they feel threatened. The caterpillar jumps off its leaf where it has left attached a thread of silk

and is suspended in the air from where it hauls itself back again. Placed on a flat surface, the caterpillar repeats in rapid succession several of these jumps, reaching with every jump up to 4 cm. Older caterpillars from the third instar upwards drop, but without a silk thread. They possess a pronounced grip effect, each object which is touched while falling is quickly gripped with the prolegs (fig. 10). The probability is low that the tree feeding caterpillars fall to the ground without touching any leaf or twig. The effectiveness of the gripping hooks of the prolegs, the crochets, is so perfect that the caterpillars can even run on the underside of a glass pane (fig. 11). All moths hatched respectively in the afternoon between 15 and 16 o'clock. The meconium evacuated shortly after eclosion has the same reddish-pink color as the hairy scales on the back of the abdomens of the adult moths.

### Acknowledgements

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**FRONT COVER PHOTO:** *Pieriballia viardi* (Boisduval, 1836) (Pieridae), Paraguay, Dep. Itapua, Kanguery, 5. VII. 2014.

