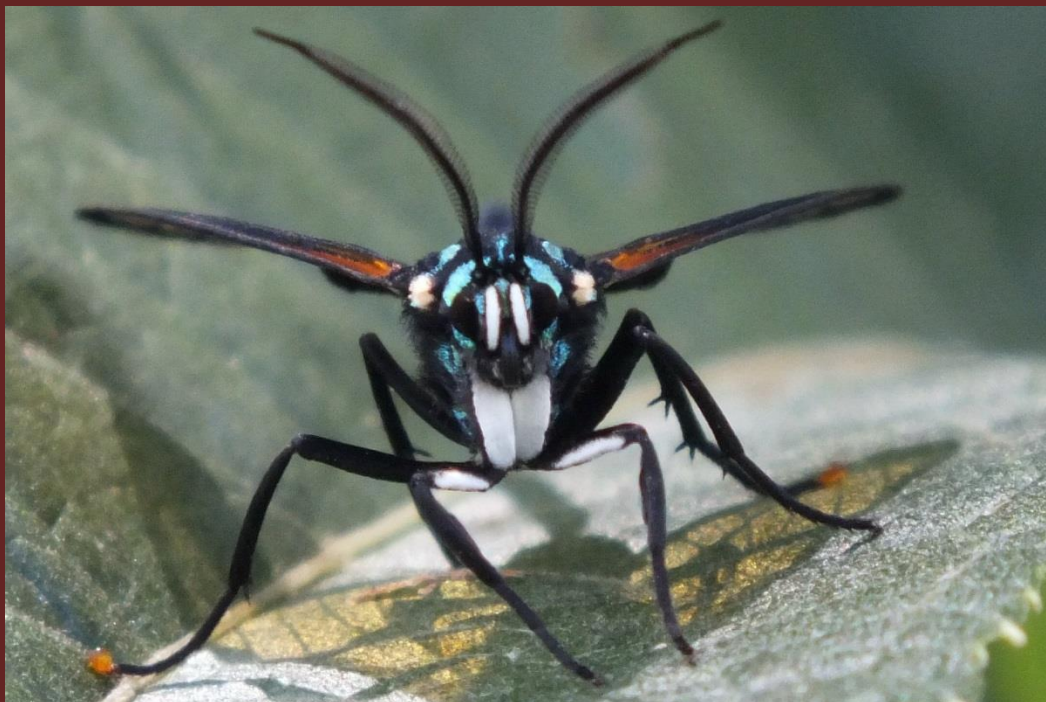


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Trichura cerberus (Pallas, 1772)

foto: U. Drechsel

The early stages of *Eupseudosoma involuta* (Sepp, [1855]) (Lepidoptera: Erebidae: Arctiinae)

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Abstract: The immature stages of *Eupseudosoma involuta* (Sepp, [1855]) are described. In the wild a female was found in the Paraguayan department of Amambay, which laid some ova. In the laboratory the larvae were fed with leaves of *Psidium guajava* L. (Myrtaceae). One generation (oviposition to imago) lasted 39 days. Ova, larval instars, cocoon, pupa and adults are illustrated.

Resumen: Se describen los estadios inmaduros de *Eupseudosoma involuta* (Sepp, [1855]). En la naturaleza una hembra fue encontrada en Paraguay en el departamento de Amambay. En el laboratorio se alimentaron las larvas con hojas de *Psidium guajava* L. (Myrtaceae). Una generación (oviposición a imago) duró 39 días. Huevos, estadios larvales, capullo, pupa y adultos se ilustran.

Zusammenfassung: Die Entwicklungsstadien von *Eupseudosoma involuta* (Sepp, [1855]) werden beschrieben. In freier Wildbahn wurde ein Weibchen im paraguayischen Departament von Amambay gefunden. Im Labor wurden die Larven mit Blättern von *Psidium guajava* L. (Myrtaceae) gefüttert. Eine Generation (Eiablage bis Imago) dauerte 39 Tage. Eier, Larvenstadien, Kokon, Puppe und Imagos werden abgebildet.

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

Introduction

The genus *Eupseudosoma* Grote [1855] is represented in the Neotropics with five species (Vincent & Laguerre, 2014), two of these are also found in Paraguay. *E. larissa* (Druce, 1890) has been observed only in four occasions, three times in the immediate vicinity of the shore of the Rio Para-

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guay in the departments of San Pedro, Cordillera and Ñeembucú and once in the department of Concepción in the valley of La Paz creek, a tributary of the Rio Paraguay. *E. involuta* occurs from the southern United States to northern Argentina . It is widespread throughout the eastern region of Paraguay (see map) and can be found throughout the year. The early stages of *E. involuta* have already been described by Sepp (1852) and of *E. involuta floridum* Grote, 1882 of southern Florida by Dyar (1900), but their description does not match in all respects to the present observations. The differences are dealt with in the discussion.

Material and methods

The starting materials for the breeding were ova originated from a female which was found in the “Reserva Natural Kaí Rague” in the department of Amambay. The ova were transported to the laboratory and repeatedly sprayed with water until the hatching of larvae. Leaves of *Psidium guajava* L. (Myrtaceae) were offered as food and adopted without delay. 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

Ova: The light green ova are deposited individually, have a diameter of 0.87 mm and a height of 0.42 mm, are truncated at bottom and attached with the flat side to the underside of the leaves (fig. 1).

First instar: The first instar larvae hatched after four days since oviposition. Head, body and legs are amber colored and translucent. The tubercles are equipped with a few colorless hairs (fig. 2). Average width of head capsule 0.45 mm (n=4). Duration of the first instar four days.

Second instar: Head, body and legs as before. Hairs on the tubercles of thoracic segments and the last abdominal segment longer than the other, colorless with yellowish shine (fig. 3). Average width of head capsule 0.7 mm (n=4). Duration of the second instar three days.

Third instar: Head, body and legs as before. Hairs are now far more numerous and distinctly reddish brown (fig. 4). Average width of head capsule 1.1 mm (n=4). Duration of the third instar three days.

Fourth instar: Head, body and legs as before. Second and third thoracic segment in the dorsal portion dark blackish with black warts. On the second thoracic segment dorsally two tufts of short black hair (fig. 5). Average width of head capsule 1.4 mm (n=4). Duration of the fourth instar three days.

Fifth instar: Head, body and legs as before. Second thoracic segment bears now lateroventral an additional tuft of short black hair (fig. 6). Average width of head capsule 2.2 mm (n=4) . Duration of the fifth instar three days.

Sixth instar: Head, body and legs whitish, mouthparts black. Warts densely covered with pink hair, whose tips are dark red. Ventrolateral hairs of the first three abdominal segments whitish. The two tufts of short black hair on the second thoracic segment are now dark red. On the first and second thoracic segment are inserted a few white hairs between the red. They have triple length and are pointing forward (fig. 7,8). Average width of head capsule 3.1 mm (n=4). Duration of the sixth instar four days.

Seventh instar: Head, body and legs as before. Hair now with a golden glow (fig. 9). Average width of head capsule 4.2 mm (n=4). Duration of the seventh instar five days.

Cocoon: The caterpillar's hairs are woven into the exterior side of the cocoon, the inner side is made of smooth silk (fig. 11).

Pupa: The pupa is dark chestnut brown, short and compact (fig. 12).

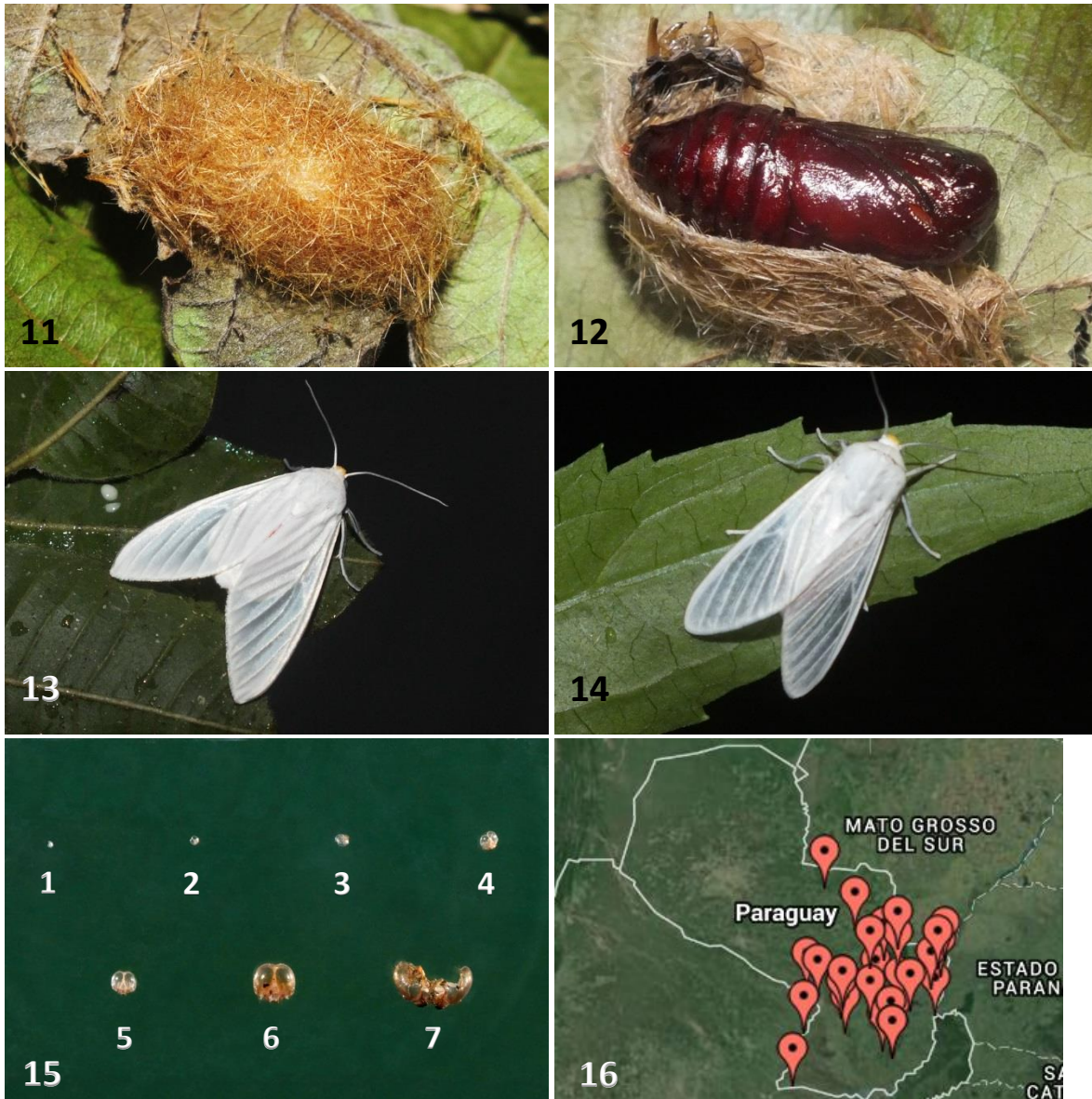
Imago: The first moth, a female (fig. 13), hatched ten days after spinning the cocoon, the first male (fig. 14) two days later.



Figs: 1-2: *Eupseudosoma involuta*; 1) ova; 2) first instar



Figs: 3-8: *Eupseudosoma involuta*; 3) second instar; 4) third instar; 5) fourth instar; 6) fifth instar; 7,8) sixth instar; 9) seventh instar; 10) a seventh instar found in the wild



Figs: 11-16: *Eupseudosoma involuta*; 11) cocoon; 12) pupa in the open cocoon; 13) female; 14) male; 15) head capsules; 16) distribution map

Discussion

The caterpillars of the first instar feed only on the lower epidermis of the leaf (fig. 2), the second instar larvae eat holes in the leaf (fig. 3) and the third instar eat the areas between the veins and the margin (fig. 4). Only the larvae of the third instar show a “bungee jumping” behavior (Silva et

al. 2014). Feeling threatened they jump off their leaf where they have left attached a thread of silk and are suspended in the air from where they haul themselves back again. Placed on the ground, they repeat in rapid succession several jumps, reaching with every jump up to 2 cm. Caterpillars of fourth to seventh instar drop but without a silk thread. They possess a pronounced grip effect, each object which is touched while falling is quickly gripped with the legs. The probability is low that the tree feeding caterpillars fall to the ground without touching any leaf or twig.

Asclepias erosa as food plant, which is mentioned in Beckett et al. (1938) seems unlikely. The assertion that the caterpillars have poisonous hairs (Rotberg, 1971) could not be confirmed. Even when touching the anterior surface of the forearm with the dorsal hairs of a larva no reaction was observed.

Both Sepp (1852) as well Dyar (1900) describe the caterpillar with yellow hair, at least in the last two instars. The discovery of such a yellow last instar larva in the wild (fig. 10) raises the question if the different colors are only variants of the same species or there are different species.

Dyar (1900) found the head immaculate in all stages but the penultimate and mentioned a black stigma on the capsule of the sixth instar. That could not be found in this breeding, all larvae had monochrome amber head capsules. Measurements of ova and head capsules are slightly different from those of Dyar (1900).

	Dyar (1900)	this study
Ova	1.1 x 0.5 mm	0.87 x 0.42 mm
Head capsule sixth instar	2.5 mm	3.1 mm
Head capsule seventh instar	3.5 mm	4.2 mm

Acknowledgements

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FRONT COVER PHOTO: *Trichura cerberus* (Pallas, 1772) (Erebidae), male, Paraguay, Dep. Amambay, Estancia Kai Rague, 26. III. 2016

