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*Tetracha lafertei* Thomson, 1857

foto: U. Drechsel

# The early stages of *Paracles aurantiaca* (Rothschild, 1910) (Lepidoptera: Erebiidae: Arctiini)

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**Abstract:** The immature stages of *Paracles aurantiaca* (Rothschild, 1910) of paraguayan origin are described. A female was found in Paraguay in the department of Concepción, which laid some eggs. In the laboratory larvae were fed with leaves of *Lactuca sativa* L. (Asteraceae). Generation (oviposition to imago) lasted 35 days. Ova, six larval instars, cocoon, pupa and adults are illustrated.

**Resumen:** Se describen los estadios inmaduros de *Paracles aurantiaca* (Rothschild, 1910). En la naturaleza una hembra fue encontrada en Paraguay en el departamento de Concepción, que puso algunos huevos. En el laboratorio se alimentaron las larvas con hojas de *Lactuca sativa* L. (Asteraceae). Una generación (oviposición a imago) duró 35 días. Huevos, seis estadios larvales, ca-pullo, pupa y adultos se ilustran.

**Zusammenfassung:** Die Praeimaginalstadien von *Paracles aurantiaca* (Rothschild, 1910) werden beschrieben. In freier Wildbahn wurde ein Weibchen im paraguayischen Departament von Concepción gefunden, welches einige Eier ablegte. Im Labor wurden die Larven mit Blättern von *Lactuca sativa* L. (Asteraceae) gefüttert. Eine Generation (Eiablage bis Imago) dauerte 35 Tage. Eier, sechs Larvenstadien, Kokon, Puppe und Imagos werden abgebildet.

**Key words:** Paraguay, Erebiidae, Arctiinae, early stages, *Paracles*.

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## Introduction

The genus *Paracles* Walker, 1855 is represented in the Neotropics with 77 described species (Vincent & Laguerre, 2014) and many still undescribed. At least 13 of these taxa were also found in Paraguay: *Paracles quadrata* (Rothschild, 1910), *P. phaeocera* (Hampson, 1905), *P. palustris* (Jørgensen, 1935), *P. emerita* (Schaus, 1933), *P. fusca* (Walker, 1856), *P. burmeisteri* (Berg, 1877), *P. contraria* Walker, 1855, *P. fosteri* (Hampson, 1905), *P. aurantiaca* (Rothschild, 1910), *P. reversa* (Jones, 1908), *P. deserticola* (Berg, 1875), *P. fosterana* Watson & Goodger, 1986 and *P. variegata* (Schaus, 1896). About breedings of three of these species, *P. palustris*, *P. fusca* and *P. contraria* has already been reported (Drechsel 2014, Drechsel & Drechsel García 2016a, 2016b). The species *P. aurantiaca* presented here has a widespread distribution in the southern cone of South America from Bolivia (Santa Cruz) and Paraguay to the states of Rio de Janeiro and Minas Gerais in Brazil (Vincent & Laguerre 2014). In Paraguay it was originally found by W. Foster in the department of Paraguairí and was part of the small series which W. Rothschild used for the description of the species. Additional records were made only in the eastern region of Paraguay in the departments of Concepción, Caazapá and Alto Paraná (see map fig. 14).

## Material and methods

The starting material for the breeding were ova originated from a female (fig. 1) which was found in the "Cerrado"-landscape in the department of Concepción. Ova were transported to the laboratory and repeatedly sprayed with water until the hatching of larvae. Leaves of *Lactuca sativa* L. (Asteraceae) were offered as food and adopted without delay. Larvae developed under ambient conditions and were housed in ventilated plastic containers. Frass of the first five instars was collected daily from the bottom of the rearing container to sort out the head capsules. 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:** Ova are deposited in groups and covered with the white hair of the female's abdomen (fig. 2). The whitish eggs have the shape of slightly flattened balls. The largest diameter is 1.05 mm and from pole to pole 0.95 mm.

**First instar:** First instar larvae hatched after five days since oviposition. Basic color of body is whitish-yellow with a lighter dorsal longitudinal stripe, head black. Each segment has a transverse row of six black warts each of which carries two or three black bristles, three times as long as the

body diameter (fig. 3). Average width of head capsule 0.45 mm (n=4). Duration of the first instar three days.

**Second instar:** The basic color is still whitish, over the middle of the back a mustard-yellow longitudinal stripe, which is accompanied laterally by a black stripe. This black stripe has a hole-like white spot on each segment. Under the black stripe each segment has a rust-red spot. An additional tiny bristle-bearing wart is formed latero-ventrally, so that now every segment has eight warts. The dorsal warts are brown and are bearing five to seven black bristles, the next two warts are brown-violet and the last small ones brown, bearing only one or two short black bristles (fig. 4). Average width of head capsule 0.63 mm (n=6). Duration of the second instar three days.

**Third instar:** Coloration largely as in the previous stage, the yellow longitudinal stripe is split into individual spots, one on each segment, connected by a white line (fig. 5). Average width of head capsule 0.98 mm (n=6). Duration of the third instar three days.

**Fourth instar:** A larger version of the former instar, the number of black bristles on each wart has risen. The longest are located on the thoracic segments and the two last abdominal segments and are mixed with single white bristles (fig. 6). Average width of head capsule 1.52 mm (n=6). Duration of the fourth instar three days.

**Fifth instar:** The basic color has changed from whitish to gray blue, the remaining coloration is largely as in the previous stage (fig. 7). Average width of head capsule 2.31 mm (n=6). Duration of the fifth instar four days.

**Sixth instar:** Similar to the former instar, the warts of the dorsal row are black with a blue core, the warts of the lateral rows are violet. The dense black bristles are about one and a half times the diameter of the body, with individual white bristles between them (figs. 8,9). Average width of head capsule 3.07 mm (n=6). Duration of the sixth instar five days.

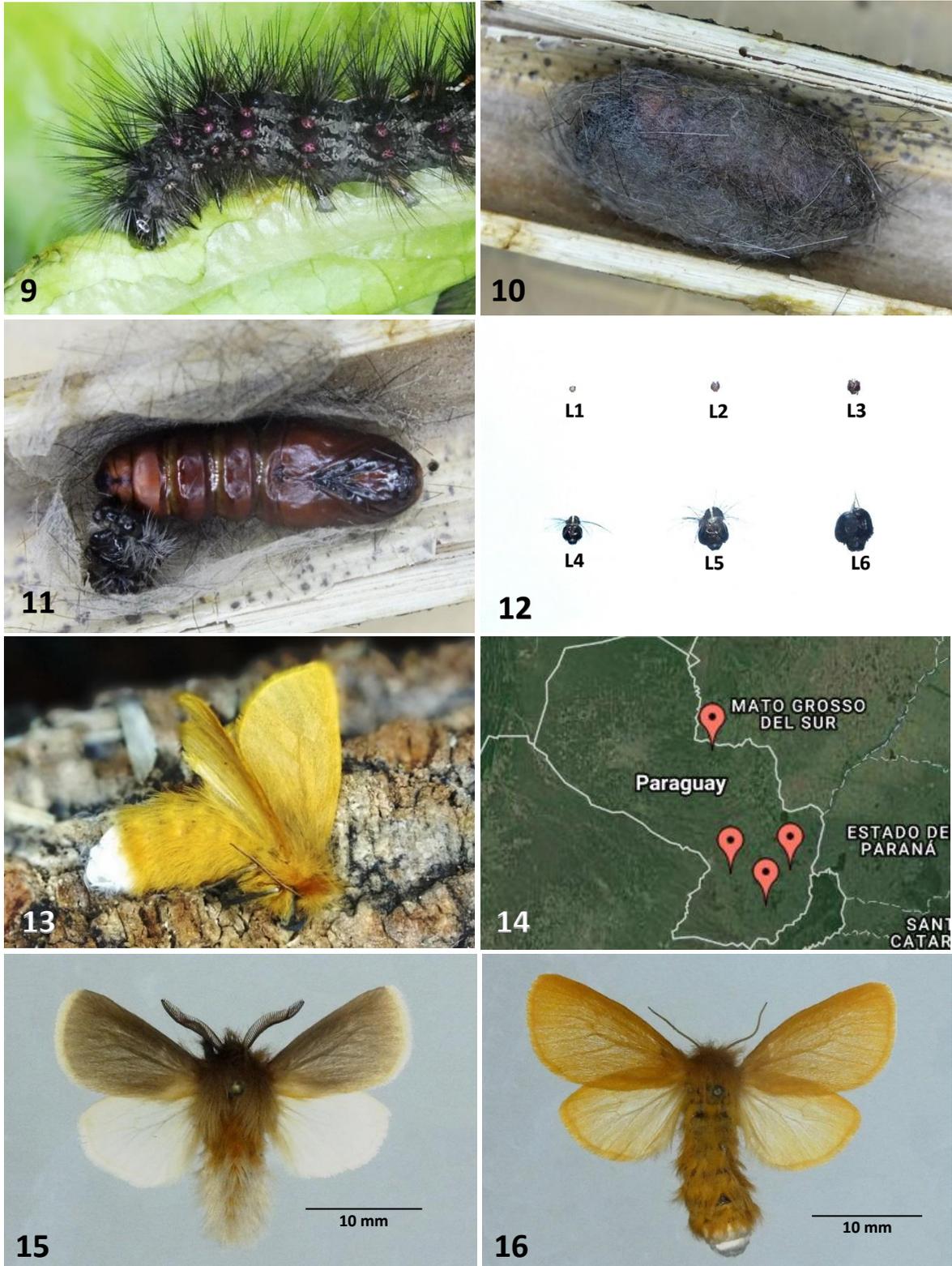
**Cocoon:** The black and the few white bristles are spun with thin grey silk threads into a loose cocoon. Because of the few spinning threads and interwoven bristles, the pupa and last larval skin can be recognized inside the translucent cocoon. It is usually spun on or under an object, and no foreign substances are woven into it (figs. 10,11).

**Pupa:** The pupa is chestnut brown with smooth glossy surface, the sheaths of the antennae and legs are black-brown (fig. 11).

**Imago:** The first moths, all females, emerged nine days after the start of weaving the cocoon, the first males one day later. The remaining moths, males and females, appeared within the following three days. All moths hatched respectively shortly after nightfall in the early night hours. Average wingspan of males 30 mm (n=4), of females 34 mm (n=3).



Figs. 1-8: *Paracles aurantiaca*; 1) female (P); 2) ova covered with hair of the female's abdomen; 3) first instar; 4) second instar; 5) third instar; 6) fourth instar; 7) fifth instar; 8) sixth instar



Figs. 9-16: *P. aurantiaca*; 9) sixth instar; 10) cocoon; 11) pupa; 12) head capsules of all six instars; 13) female in thanatosis; 14) distribution in Paraguay; 15) male spread; 16) female spread

### Discussion

Recent publications describe larvae and larval development of various species of *Paracles* such as *P. palustris* (Joergensen, 1935) (Drechsel 2014), *P. azollae* (Berg, 1877) (Morelli & Betancour 2016), *P. contraria* Walker, 1855 y *P. fusca* (Walker, 1856) (Drechsel & Drechsel García, 2016a, 2016b). A male and a female moth of *P. aurantiaca* have already been illustrated in color by Rothschild (1910) however the immature stages remained unknown.

On the first day the first instar larvae feed on the egg shells and the covering hairs of the female's abdomen, after that, they only eat the upper or lower epidermis of the leaf without creating holes. The second larvae eat holes in the leaf and the third larvae eat, starting from the edge, the whole leaf. During and after the moulting to the fifth instar, some cases of cannibalism occurred. Several larvae were nibbled and a large proportion of the liquid body contents were sucked in each case. This indicates that the larvae live solitary in the older stages and, because of their polyphagia, consider their conspecifics as food. To avoid further losses, the larvae were put in solitary confinement until pupation.

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**FRONT COVER PHOTO:** *Tetracha lafertei* Thomson, 1857 (Carabidae: Cicindelinae), Paraguay, Dep. Alto Paraná, Estancia Dimas, 7. II. 2008.

