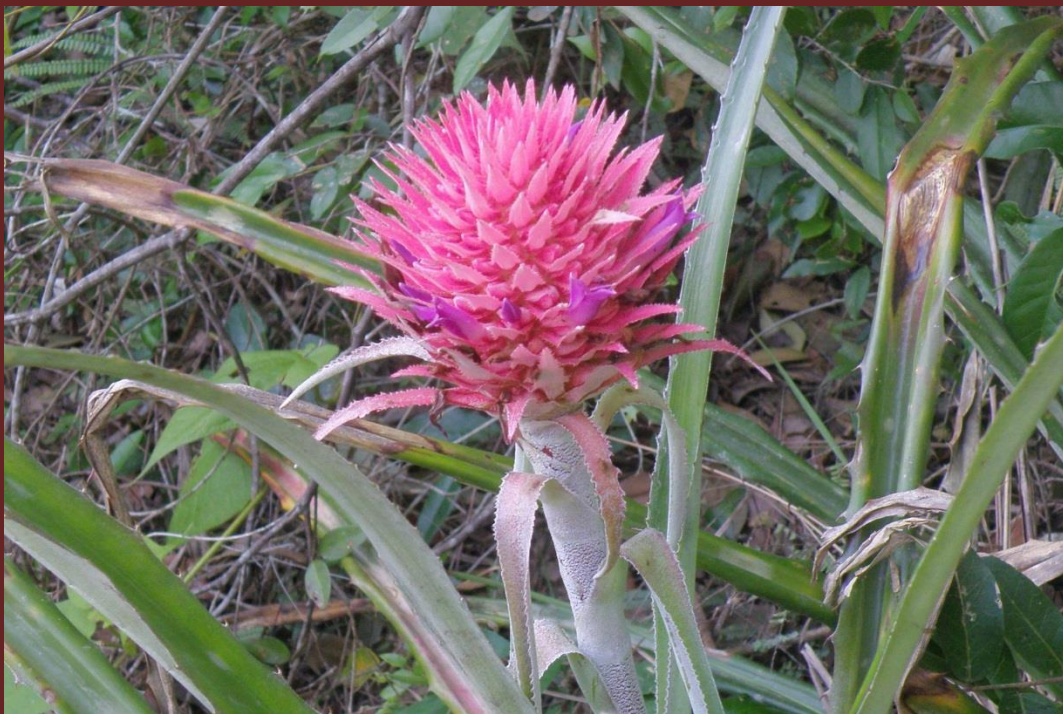


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*Pseudananas sagenarius* (Arruda da Camara) Camargo

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# The early stages of *Paracles fusca* (Walker, 1856) (Lepidoptera: Erebidae: Arctiini)

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**Abstract:** The immature stages of *Paracles fusca* (Walker, 1856) of paraguayan origin are described. A female was found in Paraguay in the department of Alto Paraná, which laid some eggs. In the laboratory larvae were fed with leaves of *Lactuca sativa* L. (Asteraceae). Generation (oviposition to imago) lasted 50 days. Ova, larval instars, cocoon, pupa and adults are illustrated.

**Resumen:** Se describen los estadios inmaduros de *Paracles fusca* (Walker, 1856). En la naturaleza una hembra fue encontrada en Paraguay en el departamento de Alto Paraná, que puso algunos huevos. En el laboratorio se alimentaron las larvas con hojas de *Lactuca sativa* L. (Asteraceae). Una generación (oviposición a imago) duró 50 días. Huevos, estadios larvales, capullo, pupa y adultos se ilustran.

**Zusammenfassung:** Die Entwicklungsstadien von *fusca* (Walker, 1856) werden beschrieben. In freier Wildbahn wurde ein Weibchen im paraguayischen Departament von Alto Paraná gefunden, welches einige Eier ablegte. Im Labor wurden die Larven mit Blättern von *Lactuca sativa* L. (Asteraceae) gefüttert. Eine Generation (Eiablage bis Imago) dauerte 50 Tage. Eier, Larvenstadien, Kokon, Puppe und Imagos werden abgebildet.

**Key words:** Paraguay, Erebidae, 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 are 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. aurantia-ca* (Rothschild, 1910), *P. reversa* (Jones, 1908), *P. deserticola* (Berg, 1875), *P. fosterana* Watson & Goodger, 1986 and *P. variegata* (Schaus, 1896). The species *P. fusca* presented here has a widespread distribution in the southern cone of South America from Argentina and Paraguay to the state of Santa Catarina in Brazil. In Paraguay it could be found only in the eastern region in the departments of Caazapá, Alto Paraná, Cordillera and Paraguari (see map, fig. 12).

### Material and methods

The starting material for the breeding were ova originated from a female (fig. 14) which was found in "Reserva Natural Dimas" in the department of Alto Paraná. 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 six 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. Molts occurred almost simultaneously in nearly all larvae in all stages, a few specimens which retarded in their development were sorted out. Voucher specimens of adult moths will be deposited in the *Museo Nacional de Historia Natural del Paraguay*.

### Immature stages

**Egg:** The hemispherical white ova have a diameter of 0.95 mm and a height of 0.65 mm, are deposited in groups and covered with the rust colored hair of the female's abdomen. They are attached to the substrate with the flat side opposite to the micropyle (fig. 1).

**First instar:** First instar larvae hatched after seven days since oviposition. Body and legs are yellowish white, head is dark brown. Each segment has a transverse row of eight black warts each of which carries two black bristles, about twice the length of the body diameter (fig. 2). Average width of head capsule 0.45 mm (n=6). Duration of the first instar five days.

**Second instar:** Head and legs black, body light violet marbled with black, a central white longitudinal stripe begins on the second thorax segment and extends to the penultimate abdominal segment. The warts are brown and wear between many short black bristles a few very long ones (fig. 3). Average width of head capsule 0.65 mm (n=6). Duration of the second instar four days.

**Third instar:** Coloration largely as in the previous stage, the warts now violet-brown. Every wart wears between brushes of dark brown and black bristles about the length of the body diameter, a single very long white bristle twice the length of the body diameter. The middle warts of the thoracic segments carry small tufts of short orange-red bristles, which protrude over the white median stripe. The white longitudinal stripe is now taking place across all segments including the first thorax segment and last abdominal segment (fig. 4). Average width of head capsule 0.97 mm (n=6). Duration of the third instar four days.

**Fourth instar:** A larger version of the former instar, the number of bristles on each wart has risen. The longest bristles are located on the thoracic segments and the two last abdominal segments (fig. 5). Average width of head capsule 1.3 mm (n=6). Duration of the fourth instar four days.

**Fifth instar:** Coloration similar as in the previous stage, now also the middle warts of the first two abdominal segments carry tufts of orange-red bristles (fig. 6). Average width of head capsule 2.1 mm (n=6). Duration of the fifth instar five days.

**Sixth instar:** Similar to the previous stage, all middle warts of the abdominal segments carry tufts of orange-red bristles protruding over the white median stripe. In addition, the four middle warts of each segment carry tufts of short black bristles (fig. 7). Average width of head capsule 2.65 mm (n=6). Duration of the sixth instar four days.

**Seventh instar:** A larger version of the previous instar (fig. 8). Average width of head capsule 3.9 mm (n=6). Spinning of cocoon after three days.

**Cocoon:** The bristles are spun with a few thin brown silk threads into a loose cocoon. Because of the few spinning threads and interwoven bristles, the pupa and last larval skin can be recognized. It is usually spun on or under an object, and no foreign substances are woven into it. The bristles are woven in parallel tufts which gives the cocoon an irregular appearance (fig. 9).

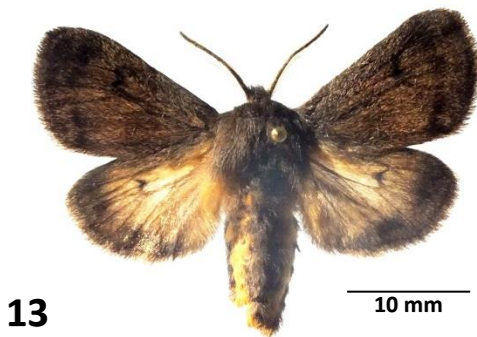
**Pupa:** The basic color of the pupa is glossy red-brown, abdominal spiracles and the dividing lines between the abdominal segments somewhat darker (fig. 9).

**Imago:** The first moth, a male (fig. 11, 13), emerged after 14 days since the start of spinning. The first female appeared three days later. The hatching took place in the late afternoon hours between 4:00 pm and 6:00 pm.





Figs. 1-2: *Paracles fusca*; 1) ova, covered with hair; 2) first instar larvae; 3) second instar larva; 4) third instar larva; 5) fourth instar larva; 6) fifth instar larva; 7) sixth instar larva; 8) seventh instar larva



Figs. 9-14: *P. fusca*; 9) cocoon with visible pupa and larval skin; 10) head capsules of all seven instars; 11) male F1; 12) known distribution in Paraguay; 13) male F1; 14) female P

### Discussion

First instar larvae feed part of their egg shells and hair of the female's abdomen during the first day, the second day they start feeding on upper and lower epidermis of the leaves. Cannibalism as in *Paracles palustris* (Joergensen, 1935) (Drechsel 2014b) could not be detected.



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**FRONT COVER PHOTO:** *Pseudananas sagenarius* (Arruda da Camara) Camargo (Bromeliaceae), Paraguay, Dep. Cordillera, Pirareta, 20. XI. 2010.

