

A new *Citheronia* from Bolivia and its immature stages (Lepidoptera: Saturniidae, Ceratocampinae)

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Abstract: *Citheronia maureillei* n. sp. is described from south-central Bolivia. It is related to the *Citheronia brissotii* group and is mainly recognizable by the mostly yellow thorax, rounded wings and few internervular spots in most specimens. This species closely resembles *Citheronia guayaquila* in appearance and *Citheronia johnsoni* in genitalia. Male and female genitalia are figured and immature stages are described and illustrated in color. Larvae fed in the laboratory on *Malosma laurina* and *Schinus molle* (Anacardiaceae), *Liquidambar* (Hamamelidaceae) and *Salix caprea* (Salicaceae).

Key words: Bolivia, Ceratocampinae, *Citheronia*, immature stages, larvae, *Malosma*, *maureillei*, Neotropical, Saturniidae.

Un nouveau *Citheronia* de Bolivie et ses stades larvaires (Lepidoptera: Saturniidae, Ceratocampinae)

Résumé: *Citheronia maureillei* n. sp. est décrit du sud central de la Bolivie. Il se situe dans le groupe de *Citheronia brissotii*, et est reconnaissable à son thorax entièrement jaune, des ailes arrondies et les taches internervulaires réduites dans la plupart des spécimens. Il est proche de *Citheronia guayaquila* par son habitus, et de *Citheronia johnsoni* par ses genitalia. Les genitalia mâles et femelles sont figurés, les stades larvaires sont décrits et illustrés en couleur. Les chenilles se nourrissent en laboratoire sur *Malosma laurina* et sur *Schinus molle* (Anacardiaceae), *Liquidambar* (Hamamelidaceae) et sur *Salix caprea* (Salicaceae).

Una *Citheronia* nueva de Bolivia y sus estadios inmaduros (Lepidoptera: Saturniidae, Ceratocampinae)

Resumen: Se describe *Citheronia maureillei* n. sp. del sur central de Bolivia. Pertenece al grupo de *Citheronia brissotii* y se reconoce mayormente por el torax amarillo, alas redondeadas y pocas manchas internervulares en la mayoría de ejemplares. Esta especie se parece mucho a *Citheronia guayaquila* externalmente y a *Citheronia johnsoni* por sus genitales. Se figuran los genitales de macho y hembra y se describe e ilustra en colores los estadios inmaduros. En el laboratorio las larvas se alimentaron de *Malosma laurina* y *Schinus molle* (Anacardiaceae), *Liquidambar* (Hamamelidaceae) y *Salix caprea* (Salicaceae).

Eine neue *Citheronia* von Bolivien und ihre Präimaginalstadien (Lepidoptera: Saturniidae, Ceratocampinae)

Zusammenfassung: Die neue Art *Citheronia maureillei* n. sp. aus dem südlichen Zentralbolivien wird beschrieben und farbig abgebildet. Sie gehört in die Gruppe von *Citheronia brissotii* und zeichnet sich in erster Linie aus durch einen gelben Thorax, runde Flügelform und meist nur wenige Flecken zwischen den Flügeladern. Habituell ähnelt sie besonders *Citheronia guayaquila*, während sie genitaliter am ehesten *Citheronia johnsoni* nahekommt. Männliche und weibliche Genitalarmaturen werden abgebildet. Die Präimaginalstadien werden beschrieben und farbig dargestellt. In

der Zucht fraßen die Raupen an *Malosma* (= *Rhus*) *laurina* und *Schinus molle* (Anacardiaceae), *Liquidambar* (Hamamelidaceae) sowie *Salix caprea* (Salicaceae).

Introduction

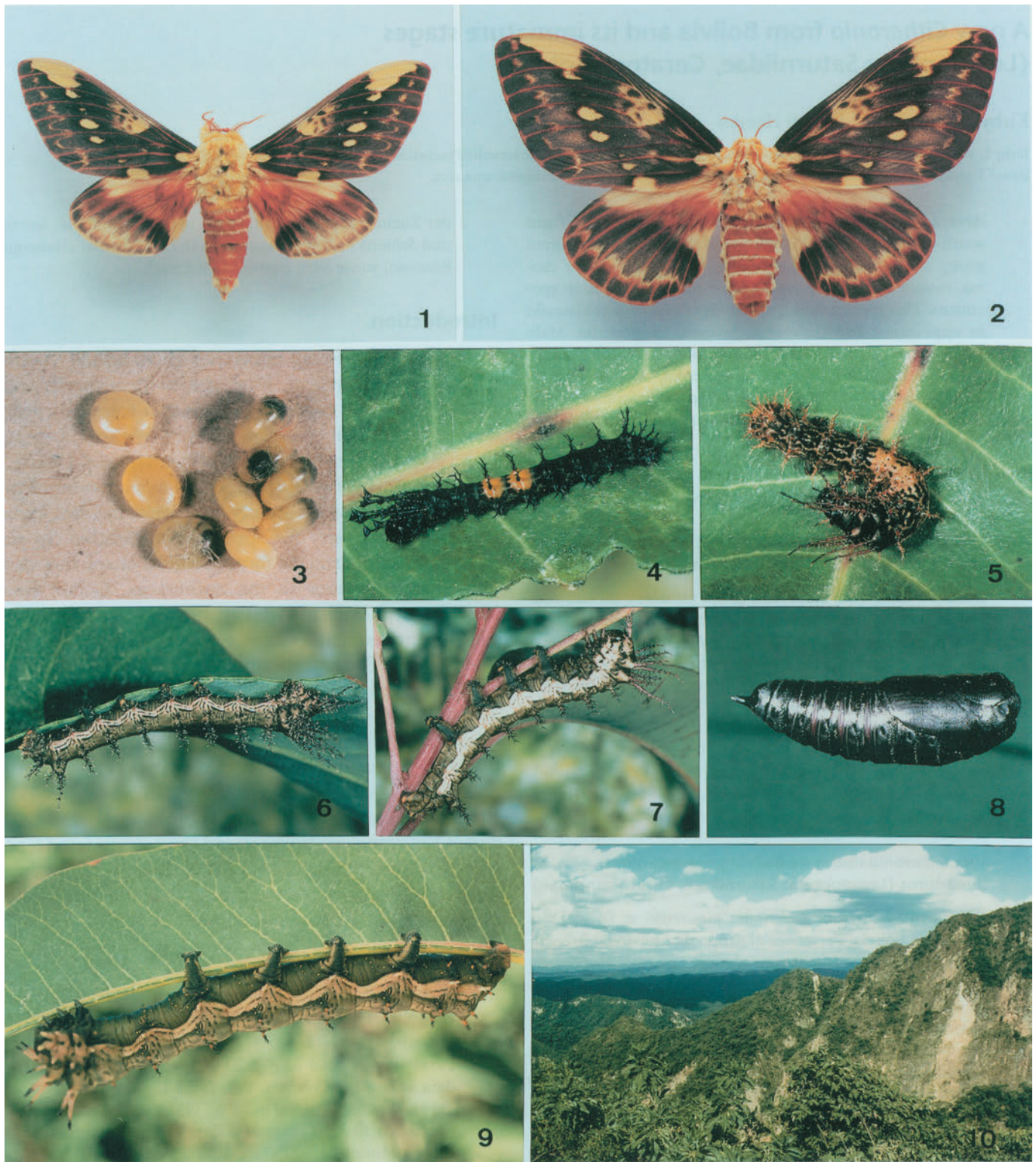
The genus *Citheronia* encompasses about 20 species of mostly large yellow, gray and reddish moths with relatively narrow triangular wings and robust torpedo-shaped bodies striped yellow and red. Within this genus there is sometimes more intraspecific regional variation than variation between species, and examination of the genitalia, fortunately usually decisively distinct, often becomes a necessity for specific identification. In the present species, external morphological characters were immediately obvious to the authors as distinct from known morphological types within the *Citheronia*, and subsequent dissection of the genitalia indicated it to be undescribed. The first specimen, a male, was collected by HERBIN and M. LAGUERRE in Tarija Department, Bolivia, at 1600 m elevation on 8 February 1997. Additional specimens were found in Chuquisaca Department: 2 additional ♂ specimens were collected by WOLFE, W. J. KELLY and C. A. CONLAN in November 1997. In November 1998 HERBIN and LAGUERRE captured another 65 ♂♂ and 7 ♀♀, and in November 1999 WOLFE and CONLAN attracted more than 75 ♂♂ and 3 ♀♀ to the lights. Eggs were obtained from the ♀♀ and reared to adult in the laboratory. Color photographs of all stages were made by WOLFE.

Citheronia maureillei n. sp.

Holotype ♂: Bolivia, Chuquisaca Dept., 10 km E of Monteagudo, el. 1400 m 19° 47.95 S, 63° 53.92 W, 5.–6. XI. 1999; at MV & UV lights, leg. K. WOLFE & C. CONLAN.

Paratypes (in total 53 ♂♂, 23 ♀♀) (all Bolivia): Allotype ♀, data as holotype, ab ovo. 1 ♂, Tarija Dept., Villa Montes to Tarija km 155, el. 1600 m, 8. II. 1997, leg. D. HERBIN & M. LAGUERRE; 30 ♂♂, Chuquisaca Dept., Valle Grande to Padilla, Nuevo Mundo, el. 2150 m, 10. XI. 1998, D. HERBIN & M. LAGUERRE; 3 ♂♂, Padilla to Camiri km 82, el. 1300 m, 12. XI. 1998, D. HERBIN & M. LAGUERRE; 8 ♀♀, Padilla to Camiri, 8 km from Muyupampa (= Vaca Guzman), el. 1650 m, 13. XI. 1998, D. HERBIN & M. LAGUERRE; 1 ♂, Chuquisaca Dept., Rd. from Padilla to Monteagudo, 83 km E. Padilla, 1300 m, 1. XII. 1997, W. KELLY, C. CONLAN & K. WOLFE; 10 ♂♂, same data as holotype; 10 ♀♀, ab ovo, same data as allotype ♀; 1 ♂, Chuquisaca prov., Muyupampa, 1650 m, 17. X. 2001, 20:00 h, leg. P. SCHMIT (CSNB); 1 ♂, 1 ♀, Tarija prov., Entre Rios, 1600 m, 3. XI. 1999, 19:00 h, leg. P. SCHMIT (CSNB); 2 ♂♂, Tarija prov., 900 m, 31. X. 1999, 22:00 h, leg. P. SCHMIT (1 ♂ dissection no. 634/02 S. NAUMANN) (CSNB); 1 ♀, Tarija prov., 1100 m, 1. XI. 1999, 10:00 h, leg. P. SCHMIT (CSNB); 2 ♂♂, 1 ♀, Chuquisaca

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Figs. 1–9: *Citheronia maureillei*. **Fig. 1:** Holotype ♂. **Fig. 2:** Allotype ♀. **Fig. 3:** Eggs. **Fig. 4:** First instar larva. **Fig. 5:** Second instar larva. **Fig. 6:** Third instar larva. **Fig. 7:** Fourth instar larva. **Fig. 8:** Pupa. **Fig. 9:** Fifth instar larva. **Fig. 10:** Habitat of *Citheronia maureillei*, Chuquisaca Department, Bolivia. — Photographs by Kirby L. WOLFE.

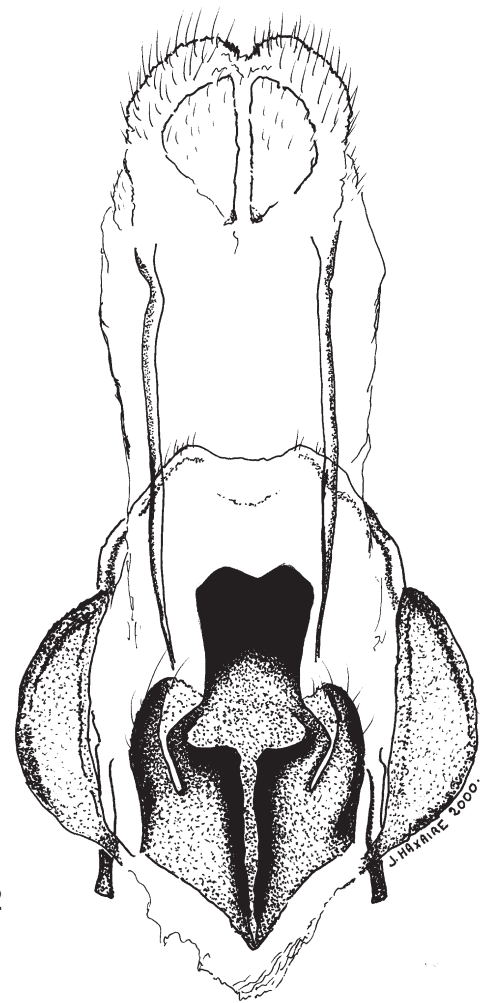
prov., Muyupampa, 1650 m, leg. 17. x. 2001 (CFMP); 1 ♂, Tarija prov., Entre Rios, 1600 m, leg. 3. xi. 1999 (CFMP); 1 ♂, Chuquisaca prov., Monteagudo, 1400 m, leg. 18. x. 2001 (CRBP); 1 ♀, Chuquisaca prov., Muyupampa, 1650 m, leg. 17. x. 2001 (CRBP). — The holotype ♂ and allotype ♀ will be deposited in the Natural History Museum of Los Angeles County (California, U.S.A.); paratypes will be placed in the Muséum national d'Histoire naturelle, Paris (France), the Natural History Museum of Los Angeles County, the San Diego Natural History Museum (California, U.S.A.),

the Natural History Museum, London (United Kingdom), the Lepidoptera collection of the Research Institute and Museum Senckenberg, Frankfurt am Main (Germany), and in the collections of R. BRECHLIN (CRBP), C. CONLAN, W. KELLY, M. LAGUERRE, C. LEMAIRE, F. MEISTER (CFMP), S. NAUMANN (CSNB), D. PURDUM and the authors.

Etymology: This species is named after Jacques MAUREILLE, an enthusiastic French amateur entomologist and photographer who died prematurely in 1995, and a close friend of the junior author.



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Figs. 11–12: Genitalia of *Citheronia maureillei*, drawings are composites combined from several dissections. Fig. 11: ♂. Fig. 12: ♀. — Drawings: Jean HAXAIRE.

Diagnosis

This new species belongs to the *Citheronia brissotii* (BOISDUVAL, 1868) group and is noticeably distinct, externally appearing closest to *C. guayaquila* SCHAUS, 1927 from which it differs in the more extensive dark blue gray areas on the upper side of the hindwing. The genitalia more resemble those of *C. johnsoni* SCHAUS, 1928 (LEMAIRE, pers. comm.). All four species have a distinctly yellow thorax, but the hindwing of *C. maureillei* is more extensively dark blue gray than in the others.

Description

Wingspan: ♂ 89 mm, ♀ 111 mm.

♂ (Fig. 1). Head: Purplish brown, palpi same, tufts of yellow scales surrounding base of antennae, these brownish yellow. Thorax: Yellow with indistinct orange lines. Abdomen: Yellow, heavily banded dorsally reddish brown. Forewing: Length 43–47 mm; slightly rounded, dark blue gray with reduced yellow internervular spots and large yellow discal area; reddish brown veins. Ventrally base of wing yellow, apical spot purple and median with purple shading; otherwise as on dorsal surface. Hindwing: basally mostly reddish brown blending into dark blue gray postmedially, costal area yellow, yellow spot at anal border and narrow submarginal band; wing narrowly bordered with golden yellow. Ventrally yellow with apical area dark blue gray; discal spot and curved postmedian purple.

♂ genitalia (Fig. 11): Genitalia with characteristics of *C. brissotii*, *C. johnsoni* and *C. guayaquila* (see LEMAIRES 1988). Uncus sclerotized, deeply notched forming widely spaced apical bilateral points, with a third ventral point between; transtilla large, sclerotized with central channel through ventral surface; costa longer than saccus and somewhat square posteriorly; saccus tipped with small spine and tuft of lesser bristles; aedeagus bifurcate with dorsal thin tube containing vesica and longer ventral broad blade-like process ventrally bent and apically rough. Genitalia differ most obviously from the above species in the more widely-spaced apical points of the uncus, and in the aedeagus, which is longer and narrower than in the others. Approximate width to length ratio of the aedeagus for *C. maureillei* = 1:7, *C. johnsoni* = 1:5.66, *C. brissotii* = 1:4, and *C. guayaquila* = 1:4.

♀ (Fig. 2). Head: Color as in ♂; antennae filiform. Thorax and abdomen as in male but abdomen broader. Forewing: Length 50–55 mm, colored as in ♂ but larger and more rounded, less contrasting; ventrally like ♂, but paler. Hindwing: As in ♂ but yellow much reduced, mostly dark blue gray dorsally and ventrally, red veins more distinct than in male hindwing.

♀ genitalia (Fig. 12): Similar to *C. brissotii* and *C. johnsoni* (see LEMAIRES 1988); central part of postvaginal plate elongated posteriorly; the accessory lateral sclerites of the anapophyses much larger than in *C. johnsoni*, each almost as large as entire plate.

Distribution

All known specimens were found within about 200 km of each other at 900–2100 m elevation. Biotope (as seen by us) is characterized by a patchwork of rainforest remnants and secondary growth mixed with non-intensive agriculture and grazing on mostly steep and broken terrain with rocky ridges.

Flight period

Specimens have been collected from October to February. Males were seen flying throughout most of the night while females arrived at the lights before 22:00 h.

Immature stages

Wild captured ♀♀ were placed in paper bags and allowed to oviposit. Eggs were maintained in a plastic-covered petri dish in the laboratory with a small piece of wet paper towel to provide moisture. Lid was misted with distilled water nightly as time of hatching neared. Eggs hatched in about two weeks and larvae were offered *Malosma laurina* (NUTT. in T. & G.) NUTT. ex ABRAMS (= *Rhus laurina*) and *Schinus terebinthifolius* RADDI (both Anacardiaceae), *Liquidambar styraciflua* L. (Hamamelidaceae), and *Salix caprea* L. (Salicaceae), all of which they immediately accepted. Larvae were reared in plastic boxes with screened lids on cut branches based in water and food was changed every 48 hours. Head capsules were collected to identify instar number, each instar was measured at full size, photographed in color and preserved in alcohol. Larvae completed 5 instars and required almost 6 weeks from hatching to pupation.

Egg: (Fig. 3) translucent yellow flattened oval, 2.7 mm long, 2 mm wide, and 1.4 mm thick, deposited flat in small groups or strings.

Larva

First instar (Fig. 4): Head: 1 mm wide, shiny black, transparent setae not easily apparent. Body: 13.5 mm max. length; black, with smooth reddish brown lumps covering most of the dorsal and upper lateral surface of the 4th and 5th abdominal segments; scoli and spines shiny black, dorsal thoracic scoli and (to a lesser extent) dorsal scoli of 8th abdominal segment greatly elongate with bulky bifurcate apex. Thoracic legs black, abdominal prolegs and paranal lobes black.

Second instar (Fig. 5): Head: 1.8 mm wide, shiny black. Body: 20 mm max. length; mottled light brown and black with black bordered white lateral line arching between segments; dorsal thoracic scoli and dorsal scoli of 8th abdominal segment mostly black, length somewhat reduced; all legs black.

Third instar (Fig. 6): Head: 2.1 mm wide, dull brownish black. Body: 30 mm max. length; pink, tinted light gray dorsally, dark gray ventrally, black on dorsal area of thorax; lateral line clear pink bordered black with inter-

rupted black central line, arches between segments; spiracles dark brown; scoli purplish brown at base, black at apex studded with white setae; thoracic legs dark purple brown, other legs black and brown.

Fourth instar (Fig. 7): Head: 3.2 mm, dull dark brown. Body: 55 mm max. length; pinkish tan washed gray dorsally and very dark gray ventrally, black on dorsal area of thorax; wide pinkish white lateral undulating band with black short lines arches between segments; spiracles yellow bordered first black then gray; scoli pink with black or black and white apex; legs as in 3rd instar.

Fifth instar (Fig. 9): Head: 5.7 mm, dull black. Body: 105 mm long, 14 mm thick fully fed; salmon pink, black ventrally, mottled gray dorsally, wide pink lateral stripe as in 4th instar; spiracles yellow bordered black; integument sparsely studded with pink single or bifurcate thorny chalazae; scoli orange pink or pink with black apex; thoracic legs black, abdominal legs and paranal lobes tan and black.

Pupa (Fig. 8): 42–46 mm long, 12–15 mm thick, dark brown, rough with slender bifurcated cremaster.

Larval hostplants

Wild: Unknown.

Laboratory: Larvae fed on *Malosma* (= *Rhus*) *laurina* and *Schinus terebinthifolius* (both Anacardiaceae), *Liquidambar styraciflua* (Hamamelidaceae), and *Salix caprea* (Salicaceae) in the laboratory.

Observations

Larvae in first and second instars usually bend themselves to resemble a bird dropping while resting on upper leaf surface (Fig. 5), as usual in *Citheronia*.

Remarks

It is very surprising that such an abundant large moth had eluded detection despite extensive moth collecting within its range by previous researchers.

Acknowledgements

We thank William J. KELLY jr., Christopher A. CONLAN and Michel LAGUERRE for their help in collecting specimens, C. A. CONLAN and David PURDUM for additional rearing observations, Jean HAXAIRE for genitalia drawings, Claude LEMAIRE for analysis of the genitalia and, with Richard S. PEIGLER, for review of the manuscript and helpful comments.

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