

# Four new Hemileucinae species from Andean highlands in Peru (Lepidoptera, Saturniidae)<sup>1</sup>

Stefan NAUMANN, Ulrich BROSCHE and Bernhard WENZEL (with a contribution by José A. BOTTEGER C.<sup>2</sup>)

Dr. Stefan NAUMANN, Hochkirchstrasse 11, D-10829 Berlin, Germany; e-mail: sn@saturniidae.com

Ulrich BROSCHE, Mühlenstrasse 22, D-32479 Hille, Germany

Bernhard WENZEL, Weinbergstrasse 3, CH-8302 Kloten, Switzerland; e-mail: bwenzel@smile.ch

**Abstract:** Four species of the subfamily Hemileucinae GROTE & ROBINSON, 1866 from Peru are described as new and figured in colour: *Gamelioides deniseae* n. sp., *Molippa pilarae* NAUMANN, BROSCHE, WENZEL & BOTTEGER n. sp., *Automeris claryi* n. sp., and *A. labriquei* n. sp. Males and females of all species plus micropreparation scans of all male genitalia structures are figured, the differences of the new taxa to already known species are discussed. All holotypes and allotypes will be deposited in the collections of the Naturkunde-Museum der Humboldt-Universität in Berlin, Germany.

**Key words:** Lepidoptera, Saturniidae, Hemileucinae, *Gamelioides* LEMAIRE, 1988, *Molippa* WALKER, 1855, *Automeris* HÜBNER, 1819 ("1816"), new species.

## Cuatro especies nuevas de Hemileucinae del altiplano andino en Perú (Lepidoptera, Saturniidae)

**Resumen:** Cuatro especies de la subfamilia Hemileucinae GROTE & ROBINSON, 1866 de Perú se describen como nuevas, con ilustraciones en color: *Gamelioides deniseae* n. sp., *Molippa pilarae* NAUMANN, BROSCHE, WENZEL & BOTTEGER n. sp., *Automeris claryi* n. sp., y *A. labriquei* n. sp. Machos y hembras de todas las especies así como los escaneos de las preparaciones de todas las estructuras ♂ genitales vienen ilustrados, las diferencias entre los taxones nuevos y las especies ya conocidas son expuestas. Todos los holotipos y alotipos serán incorporados a las colecciones del Naturkunde-Museum der Humboldt-Universität en Berlín, Alemania.

## Vier neue Arten der Subfamilie Hemileucinae aus dem Anden-Hochland von Peru (Lepidoptera, Saturniidae)

**Zusammenfassung:** Vier neue Arten der Subfamilie Hemileucinae GROTE & ROBINSON, 1866 werden als neu beschrieben und farbig abgebildet: *Gamelioides deniseae* n. sp., *Molippa pilarae* NAUMANN, BROSCHE, WENZEL & BOTTEGER n. sp., *Automeris claryi* n. sp. und *A. labriquei* n. sp. Männchen und Weibchen aller Arten sowie Scans der männlichen Genitalstrukturen werden abgebildet, die Unterschiede zu ihren nächsten Verwandten werden erörtert. Sämtliche Holo- und Allotypen der hier beschriebenen Arten werden in die Sammlung des Naturkundemuseums der Humboldt-Universität zu Berlin, Deutschland, gelangen.

## Introduction

Only recently some papers on Peruvian Saturniidae were published by NAUMANN et al. (2005) and WENZEL & NAUMANN (2005). Meanwhile, during preparation of those publications, further interesting (in part spectacular) material was collected in Peru by José "Pepe" BOTTEGER.

Some of the specimens immediately appeared so different to anything known (which later was confirmed by genitalia preparations and literature studies) that we decided to publish this short descriptive work prior to any further longer articles. Further papers with descriptions of life histories and new species are currently in preparation by the authors.

So far not many papers exclusively on the Peruvian Saturniidae fauna were published; aside of the huge work by Claude LEMAIRE, who generally worked on the Nearctic and Neotropical fauna with single descriptions or subfamilial revisions, there were few general faunal papers printed. These are, e.g., LAMAS (1997) for the Cordillera del Cóndor, LAMAS (2001) and LAMAS & GRADOS (2001) for the Northern Cordillera de Vilcabamba, or, only published most recently, L. & T. RACHELI (2005) on the Saturniidae fauna from Muyo, Oliva, Amazonas Department. A complete faunal work for the Saturniidae fauna of Peru, such as published by LEMAIRE & VENEDICTOFF (1989) for Ecuador, does not exist so far.

## Abbreviations:

- CBH collection BROSCHE, Hille, Germany  
 CBWK collection Bernhard WENZEL, Kloten, Switzerland  
 CFMP collection Frank MEISTER, Prenzlau, Germany  
 CSNB collection Stefan NAUMANN, Berlin, Germany  
 Lfw length of forewing, measured in a direct line from the base to the apex (if possible, of the right forewing)  
 ZMHU Museum für Naturkunde der Humboldt-Universität zu Berlin, Germany

## Descriptions

### *Gamelioides deniseae* n. sp.

**Holotype** (Figs. 1/2): ♂, Peru, Cuzco Departamento, Quillabamba Provincia, Huayopata Distrito, Carrizales, 3240 m, humid rain forest, 13°5'25.5" S, 72°23'17.0" W, iv. 2005, leg. José BOTTEGER, ex CBH. The holotype will be deposited in ZMHU.

**Paratypes** (in total 12 ♂♂, 1 ♀): all Peru: 1 ♀, Cuzco Departamento, Vallée Quillabamba, 21 km Col, 3340 m, 5. x. 2004, leg. Pierre SCHMIT (CFMP) (Figs. 3/4); 3 ♂♂, same data as holotype, 1 genitalia no. CBH 0463 (CBH); 6 ♂♂, same locality as holotype, iii. 2005 (CBWK); 3 ♂♂, same data as holotype, 1 genitalia no. 1207/05 NAUMANN (CSNB).

**Derivatio nominis:** The species is named in honour of Denise GEHRIG from Uster, Switzerland, friend of B.W., one of the authors.

<sup>1</sup> Further information on the authors' Saturniidae studies under: www.saturniidae.com

<sup>2</sup> José Antonio BOTTEGER CARDENAS, Jr. Lima 247, Oxapampa, Pasco, Peru; e-mail: icamperia@yahoo.com

## Description

♂ (Figs. 1/2): Lfw 28.0–32.5 mm ( $\emptyset$  30.5 mm, n = 10; holotype 32.5 mm). Ground colour of forewings dark chestnut brown. Antennae in ground colour, ca. 7.0–8.5 mm long, bipectinate in the first 21 segments, apical two segments with reduced pectination. Longest rami 1.2 mm long. Thorax and abdomen on dorsal side covered with dark brown hair, ventral parts orange. Legs orange with grey hair on outer margin of tibia and tarsi. Costa, antemedian, median and postmedian areas of the forewings also in ground colour, very homogenous, separated only by a 1 mm broad row of yellow scales forming the bent ante- and postmedian line. Basal to the latter the wing is somewhat lighter, the round forewing dot hinted, dark brown, of around 4.0–5.0 mm diameter, with a very small hyaline center. Forewing apex almost rectangular, in some specimens with a small outer tip. Hindwing with genus-typical pattern; ground colour a vivid orange red, basal and around the anal margin suffused with long brown hairs. There is a central ocellus of orange colour with small central lenticular black patch and in most specimens very small hyaline portion. The ocellus is surrounded by a black, ca. 2.0–2.5 mm broad ring which is bordered directly by a very thin black postmedian line. The form of the hindwing is quite rounded. Ventral side of both fore- and hindwings vivid orange, with several pattern elements: Both fore- and hindwing have a costal and outer portion which is suffused with light grey scales, the round forewing dot is black with a thin longitudinal white line, the dark postmedian line is hinted in the forewing. The orange part of the hindwing ocellus is represented completely on the ventral side as well, ringed only very thin with a dark grey portion. All orange parts are suffused slightly with grey scales.

♂ **genitalia** (Fig. 5; genitalia no. 1207/05 NAUMANN): Typical for the genus, but in certain elements different to the structures described and figured by LEMAIRE (2002: 352, pl. 34, fig. 5) for *G. elainae*. Uncus narrow, basally triangular, heavily sclerotized in its tip which is little bent in ventral direction. Gnathos rounded, with two lateral slender spine-like processes which are turned posterior. Valves bilobed apically, both lobes rounded, not as slender as in LEMAIRE's figure for *G. elainae*, and the ventral one heavily covered with bristles on the outer margin. Sacculus very long, internal to the furcation between both apical lobes there is a heavily sclerotized inner process of the valves. Juxta membranous, saccus small and triangular, the aedeagus slender, bent strongly, caecum penis bilobed, vesica very short, emerging ventrally without any sclerotizations. Sternite of eighth abdominal segment bilobed, with two long lateral processes (Fig. 5, top left), 8th tergite roof-like, rounded (not illustrated).

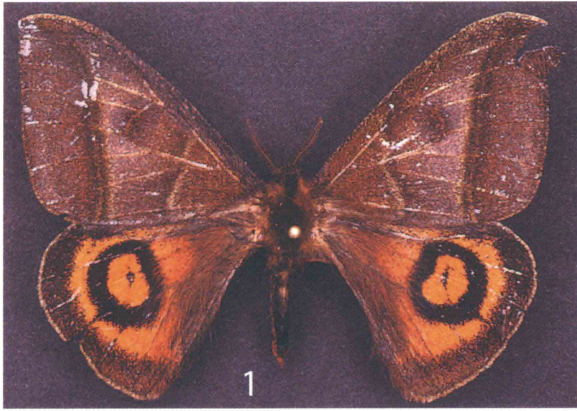
♀ (Figs. 3/4): Lfw 36.0 mm (n = 1). Ground colour light grey. Antennae in ground colour, ca. 10.5 mm long, fasciculate (SCOBLE 1992; after LEMAIRE 2002: 352 the

♀ antennae are shortly bidentate). Head, thorax and abdomen, from both dorsal and ventral side uniform in the light greyish ground colour, thorax with longer grey hair. Forewings on dorsal side of homogenous character, only markings are the darker grey straight antemedian line, the concave postmedian line, both bordered by few yellow scales, and the small whitish lenticular central dot in between. The forewing apex almost rectangular with small outer tip. Hindwing on dorsal side of same ground colour, basally with long darker grey hair, and with a typical vivid orange hindwing ocellus of 6.5 mm diameter with small central lenticular black patch with very small hyaline portion, similar to the ♂♂. The ocellus is bordered by a black ring. The postmedian line is of typical dark orange colour, followed by a darker grey submarginal and a lighter grey marginal zone. On ventral side the forewing is of homogenous light grey, but there is a central ocellus of orange colour which is little lenticular and 3 mm long in maximum diameter. It is bordered by a black ring. Only other marking on both fore- and hindwings is the dark grey bent postmedian line.

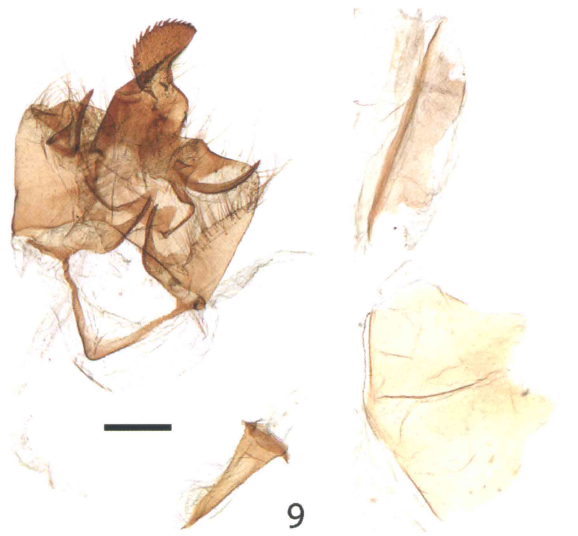
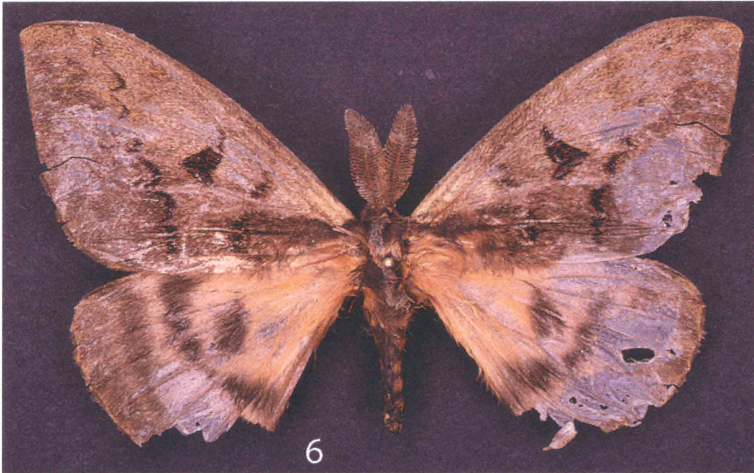
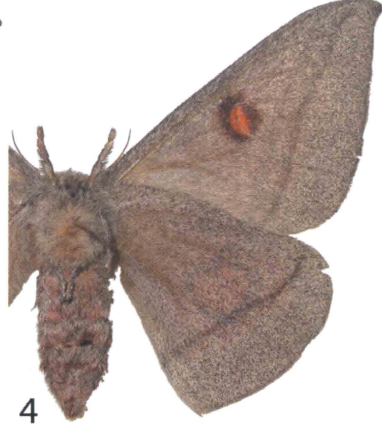
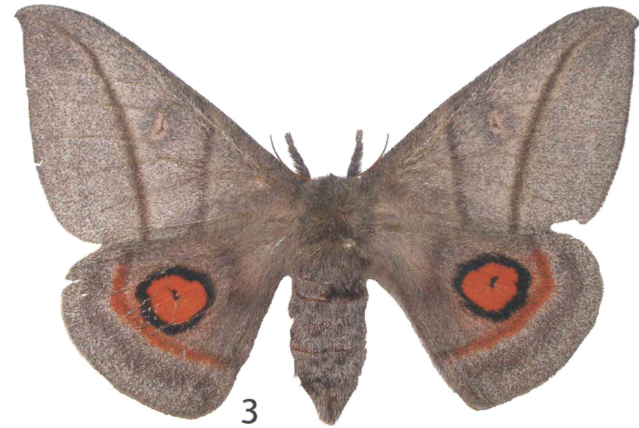
## Additional notes

*Gamelioides seitzii* (DRAUDT, 1929), the second species in the genus described from Peru and of which only the ♀ holotype in ZMHU is known so far (figured by DRAUDT 1929: pl. 111b, and again in LEMAIRE 2002: pl. 125, fig. 3), differs from the species described here by its somewhat smaller size, the more ochreous colour (which may be caused by some bleaching of the specimen), the typical white center of the hindwing ocellus and an orange coloured outer shadow of the postmedian line of the hindwing. *G. elainae* (LEMAIRE, 1967) which looks much more similar to *G. deniseae*, shows a more falcate forewing apex, a more longitudinal hindwing form with a typical thin postmedian line which always is far away from the ocellus and never touches it; furtheron, the hindwing ocellus has a distinct black center with a larger hyaline part, and there are easily visible differences in the ♂ genitalia structures of *G. deniseae* such as the rounder and shorter dorsal lobe of the valves, the long lateral spine-like processes of the round gnathos, the triangular saccus, or the structures of the 8th abdominal segment which do not explicitly exist after LEMAIRE's description. The ♀ of *G. elainae* such as shown by LEMAIRE (1974: pl. 58, fig. 5; 2002: pl. 23, fig. 9) has a similar hindwing ocellus as the ♂ with

**Colour plate 1:** Figs. 1–2: *Gamelioides deniseae* n. sp., ♂ holotype. Fig. 1: dorsal view. Fig. 2: ventral view. Figs. 3–4: *G. deniseae* n. sp., ♀ paratype. Fig. 3: dorsal view. Fig. 4: ventral view. Fig. 5: *G. deniseae* n. sp., paratype, ♂ genitalia, prep. no. 1207/05 NAUMANN; top left: 8th tergite, same size. — Figs. 6–7: *Molippa pilarae* n. sp., ♂ holotype. Fig. 6: dorsal view. Fig. 7: ventral view. Fig. 8: *M. pilarae* n. sp., ♀ allotype, dorsal view. Fig. 9: *M. pilarae* n. sp., paratype, ♂ genitalia, prep. no. 1206/05 NAUMANN; right side: 8th tergite and sternite, less enlarged than other parts. — Specimens not figured to the same scale. Most genitalia preparations (except Fig. 9, right side, 8th tergite and sternite) figured to the same scale, scale bar = 1.0 mm.



5



large black central dot with hyaline center, and a dark grey postmedian line, while that of the only known *G. deniseae* ♀ is orange. ♂♂ of *G. deniseae* were found to be active during whole night.

***Molippa pilarae* NAUMANN, BROSCHE, WENCZEL & BOTTGGER n. sp.**

**Holotype** (Figs. 6/7): ♂, Peru, Cuzco Departamento, Quillabamba Provincia, Huayopata Distrito, Alfamayo, 2600 m, humid rain forest, ca. 13°5' S, 72°23' W, III. 2005, leg. José BOTTGGER, ex CBH. The holotype will be deposited (together with the allotype) in ZMHU.

**Paratypes** (5 ♂♂, 1 ♀ in total): all Peru: allotype ♀ (Figs. 8/10), Cuzco Departamento, Quillabamba Provincia, Huayopata Distrito, Carrizales, 3240 m, humid rain forest, GPS data 13°5'25.5" S, 72°23'17.0" W, III. 2005, leg. José BOTTGGER, ex CBH (ZMHU). 2 ♂♂, same data as allotype, 1 genitalia no. CBH 0461 (CBH); 1 ♂, same data as allotype (CBWK); 2 ♂♂, same data as allotype, 1 genitalia no. 1206/05 NAUMANN (CSNB).

**Derivatio nominis:** The species is named in honour of Pilar BOTTGGER CHAVEZ-SILVA, the wife of the collector (and naming co-author) of this very interesting species, José BOTTGGER, in recognition of her sustaining help during the expeditions of her husband.

**Description**

♂ (Figs. 6/7): Antennae quadripectinate, ochreous brown, with 32 segments, 13.0–15.0 mm long (holotype: 14.0 mm), longest rami 2.2 mm long. Ground colour greyish brown. Head and thorax covered with long dark blackish brown hair, on the thorax suffused with single longer pink bristles and laterally at the wing base a patch of pink hair. Dorsal side of the abdomen ringed dark yellow and brown with median dark line. On ventral side head, thorax including legs, and abdomen in ground colour, at the basis of the legs pinkish violet hair. Lfw 47.0–53.5 mm (♂ 49.5 mm, n = 6; holotype 51.0 mm). Wings with few markings typical for the genus: In the forewing antemedian field darker, almost black, bordered with a black zigzag line to the median field which contains the typical large dark patch with one tip turned outwardly. Median and postmedian area in ground colour, separated by a darker zigzag line. Forewing apex a little rounded, the postmedian zigzag band ending exactly at the costal end. Hindwing in the basal half with typical light pink colour, with a large oval black dot in antemedian area, bordered by a broad black zigzag postmedian band. Posterior to this again a small pink portion, followed by a straight dark brown submarginal line (which, of course, is slightly invisible in the holotype due to damage). Marginal area in ground colour. Marginal fringes of both fore- and hindwing dark brown, alternated by yellow ones at the veins' ends. Underside of wings very homogenous in lighter pinkish grey, only markings are small darker lenticular dots of both fore- and hindwing ocellus, a dark zigzag postmedian line followed by a hinted shadow-like submarginal line, and at the basal side of the forewing a homogenous pink portion.

♂ genitalia (Fig. 9; genitalia no. 1206/05 NAUMANN): Very typical for the genus, the broad-based uncus is helmetlike downcurved and has a dorsal row of small teeth at its posterior end. Gnathos hardly bilobed, more furcate than in other species, e.g. in *M. bertrandi* LEMAIRE, 1982 or *M. luzalessarum* NAUMANN, BROSCHE & WENCZEL, 2005. Valves with two ventral protuberances on the sacculus and a typical inner bent dorsal spine. Dorsal margin of the valves almost rectangular. Saccus relatively broad for the genus, juxta with two lateral processes which are broader than in the latter two species and bent almost rectangular. Aedeagus short, with two typical lateral and basal processes, the vesica emerging on ventral side. Sternite of the eighth abdominal segment with two lateral lobes which are slightly longer than in the two nearest relatives mentioned above; tergite of that segment short, with laterally indicated lobes (Fig. 9, right; less enlarged than other parts of genitalia).

♀ (Figs. 8/10): Generally, very similar to the ♂ with same dark grey ground colour, but pattern elements more distinct. Antennae of ochreous brown colour, fasciculate, with 33 segments, in total 12.5 mm long. Hair of thorax suffused with more and longer single, pink and ochreous hairs, dorsal part of the abdomen broadly ringed yellow and black. Ventral side of the thorax, femoral and tibial hair of the legs and ventral side of the abdomen dark grey, suffused with yellow hair. Right forewing length 54.0 mm, a little more rounded than in ♂♂; in addition to the forewing markings which are described for the ♂ already, all pattern elements appear more intensively and separated from their area around by a yellowish-pink line of scales, the submarginal zone in the forewing is somewhat darkened, and the hindwing has more pinkish transparent parts basal to the postmedian line. Wing undersides similar to the ♂.

**Additional notes**

Generally, *M. pilarae* resembles very much the smaller *M. bertrandi*, which so far is known from medium to high elevations in San Martin, Amazonas and Pasco departments of Peru (LEMAIRE 2002, NAUMANN et al. 2005); that species is much smaller and also differs by its straight postmedian line of the hindwing which is connected with the hindwing central patch, a more falcate forewing apex, a differently shaped forewing patch, and the ♂ genitalia structures. The recently described *M. luzalessarum* from Pasco is a member of the same group within the genus, but can easily be separated by its smaller size, the complete missing of any pink pattern, and the ♂ genitalia structures, too. Generally, *M. pilarae* by far is the largest species within the genus, and shares some very typical pattern elements with the Andean genus *Erythromeris* LEMAIRE, 1969, especially with *E. flexilineata* (DOGNIN, 1911) and *E. obscurior* LEMAIRE, 1975. However, by its ♂ genitalia structures it easily can be confined to the genus *Molippa* anyway. *M. pilarae* is an early evening flyer.

## *Automeris claryi* n. sp.

**Holotype** (Figs. 11/12): ♂, Peru, Puno Departamento, Sandia Provincia, Limbani Distrito, Carcel Punko, 2593 m, humid rain forest, 14°5'57.4" S, 69°41'10.2" W, iv. 2005, leg. José BOTTGGER, genitalia no. 1261/05 NAUMANN, ex CSNB. The holotype will be deposited (together with the allotype) in ZMHU.

**Paratypes** (in total 7 ♂♂, 3 ♀♀): all Peru: allotype (Figs. 13/14) ♀, same data as holotype, leg. José BOTTGGER, ex CSNB (ZMHU). 1 ♂, 1 ♀, same data as holotype (CBH); 1 ♂, same locality as holotype, v. 2005 (CBH); 3 ♂♂, 1 ♀, same data as holotype (CBWK); 2 ♂♂, same data as holotype (CSNB).

**Derivatio nominis:** The species is named in honour of Joël CLARY, conservateur des collections, of the Museum d'Histoire naturelle de Lyon, Centre de Conservation et d'Étude des Collections, in recognition of his help during the several visits of two of the authors (S.N. & U.B.).

### Description

♂ (Figs. 11/12): Ground colour of head, thorax, abdomen and forewings dark greyish brown. Antennae quadripectinate, with 26 segments, 10.5–13.0 mm long ( $\emptyset$  11.1 mm,  $n = 7$ ; holotype 10.5 mm), longest dorsal rami 1.9 mm, rami of the last two segments reduced, ochreous brown. Lfw 36.0–39.5 mm ( $\emptyset$  38.0 mm,  $n = 7$ ; holotype 37.5 mm). The long brown hair of the thorax is suffused with single longer greyish white hairs on dorsal side, the first two segments of the dorsal abdomen also with longer brown hair suffused with single ochreous hairs, the anal tip of the abdomen with ochreous brown bristles. On ventral side head and thorax with legs in ground colour, the ventral part of the abdomen more pinkish brown. The dark forewings have typical markings on the dorsal side: A darker antemedian zigzag band, a central patch in ground colour, surrounded with six black dots, a straight postmedian line, ending proximal to the blunt forewing apex on the costal margin, followed by a darker brown portion of the postmedian field. Marginal area again in ground colour. The hindwings with a typical greyish pink basal and median area with a black ocellus with little lighter, dark grey pupilla and white discocellular center; the round ocellus has a maximum diameter of 7.0–8.0 mm (holotype 7.0 mm). It is followed by an undulated black postmedian and a similar submarginal band. The outer margin again in the greyish brown ground colour. Fore- and hindwing undersides very homogenous and of pinkish brown colour. Only pattern elements are the black round forewing dot with small white central dot, a dark grey straight postmedian line which is turned to the darkened apex, and in the hindwing the white central dot of the dorsal ocellus plus shadow of the straight postmedian line. Living specimens in their natural habitat showed more vivid colours, only two weeks of transport let them become little lighter and less colourful, especially their pink portions.

♂ **genitalia** (Fig. 15; genitalia no. 1261/05 NAUMANN): The ♂ genitalia structures are somewhat unique within the genus. Uncus almost triangular, with its tip bent in ventral direction. Gnathos very typical, large, rectangu-

lar with two lateral, heavily sclerotized processes. Valves long, with a dorsal lobe and an inner apical spine which is heavily sclerotized at its tip and bent into ventral direction. Saccus long, slender and ampule-like, juxta with two short, slightly visible lateral processes. Aedeagus relatively short, vesica emerging on ventral side, without any spiculae, generally the form of this structure is not very significant in the genus.

♀ (Figs. 13/14): There is well marked sexual dimorphism in that species but ♀♀ could be classified with the ♂♂ easily due to their typical wing pattern. Generally, the ♀ is less colourful, the forewing ground colour a dark and little transparent violet brown, and both fore- and hindwings are more rounded. Antennae fasciculate, with 27 segments, 9.5–10.0 mm long ( $\emptyset$  9.6 mm,  $n = 3$ ; allotype 9.5 mm), ochreous brown. Forewing length 39.0–42.5 mm ( $\emptyset$  41.0 mm,  $n = 3$ ; allotype 39.0 mm). The long brown hair of the thorax is suffused with single longer greyish yellow hairs on dorsal side, the first two segments of the dorsal abdomen also with longer brown hair suffused with single ochreous hairs, dorsal side of abdomen dark greyish brown with intersegmental tufts of greyish yellow bristles, as well as on the tip of the abdomen. Ventral side of thorax including legs and abdomen of dark greyish brown colour, last segments of abdomen suffused with rusty orange bristles, ventrolaterally with longer and lighter hairs. Forewings more homogenous than in the ♂, in ground colour. Central patch almost invisible, only outlined by the small black lateral dots as in male, and with a small central white dot. Dark yellow postmedian line straight, ending costal near the apex which is more rounded than in ♂♂, pattern of the postmedian and marginal area similar to the ♂♂, but suffused with few yellow scales. Hindwing almost similar to the ♂♂, only difference is the missing pink portion which is greyish in the ♀, and the little broader portion of the outer margin. Colour and pattern of wings on ventral side again similar to the ♂♂, only difference is the less indicated postmedian line of the forewing plus, as noted before, the higher grade of transparency.

### Additional notes

The combination of brown forewing and basal pink hindwing with black ocellus and typical two outer black circles make that species somewhat unique within the genus. Due to forewing colour and pink portion of the hindwing it shares similarities with *A. cryptica* DOGNIN, 1911, and *A. windiana* LEMAIRE, 1972 but can easily be separated from those by details of wing pattern and genitalia structures. The forewing pattern of *A. claryi* is not very typical for the genus and shows some characters of the genus *Pseudautomeris* LEMAIRE, 1967. LEMAIRE (1973: 350; 1974: 560; 2002: 362) places the two species mentioned above unassigned to any group within the genus due to their distinctive characters, and also we are unable to assign *A. claryi* to any group erected by LEMAIRE within the genus *Automeris*.

## *Automeris labriquei* n. sp.

**Holotype** (Figs. 16/17): ♂, Peru, Puno Departamento, Sandia Provincia, Limbani Distrito, Carcel Punko, 2593 m, humid rain forest, 14°5'57.4" S, 69°41'10.2" W, iv. 2005, leg. José BOTTGER, genitalia no. 1262/05 NAUMANN, ex CSNB. The holotype will be deposited (together with the allotype) in ZMHU.

**Paratypes** (13 ♂♂, 2 ♀♀ in total): all Peru: allotype (Figs. 18/19) ♀, same data as holotype, leg. José BOTTGER, ex CSNB (ZMHU). 1 ♂, same data as holotype, genitalia no. CBH 0460 (CBH); 3 ♂♂, same locality as holotype, v. 2005 (CBH); 5 ♂♂, 1 ♀, same data as holotype (CBWK); 3 ♂♂, same data as holotype (CSNB); 1 ♂, Puno Dept., Sandia Prov., Limbani Distr., Aquele, humid rain forest, 2129 m, 14°4'22.9" S, 69°42'25.5" W, v. 2005, leg. José BOTTGER (CSNB).

**Derivatio nominis:** The species is named in honour of Dr. Harold LABRIQUE, attaché de conservation at the Museum d'Histoire naturelle de Lyon, Centre de Conservation et d'Étude des Collections, in recognition of his help during the several visits of two of the authors (S.N. & U.B.).

## Description

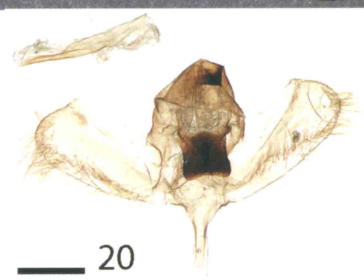
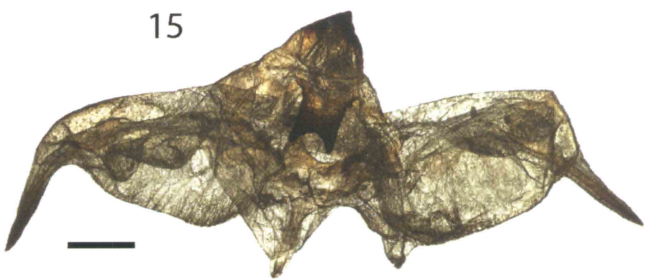
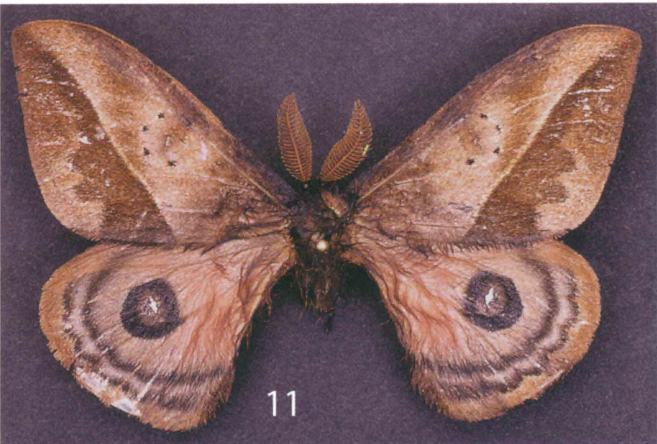
♂ (Figs. 16/17): Ground colour of head, thorax and forewings more or less greenish grey. Antennae quadripectinate, with 25 segments, 8.0–11.0 mm long ( $\emptyset$  9.1 mm,  $n = 14$ ; holotype 9.5 mm), longest dorsal rami 1.6 mm, rami of the last three segments reduced, orange brown. Lfw 31.0–36.0 mm ( $\emptyset$  32.6 mm,  $n = 14$ ; holotype 32.0 mm). The long greenish hair of the thorax is suffused with single longer greyish white hairs on dorsal side, basally to the forewings there are small tufts of greyish white bristles. Abdomen on dorsal side brownish carmine, the tip of the last segment with ochreous bristles. On ventral side thorax and abdomen in the ground colour, only tibia and femur of the legs somewhat darker brown. Dorsal side of the forewing almost homogenous in the ground colour, there is a little darker slightly indicated antemedian zigzag band, and the center forewing patch is oval, centrally dark grey with in some specimens indicated central very small hyaline portion, outer margin of the patch very thin black. The yellow and dark grey postmedian band is slightly concave and turned directly to the almost rectangular forewing apex, posterior to it the wing is somewhat darkened, marginal area again in the ground colour. Hindwing with typical greyish pink basal portion, followed by the almost round, black ocellus of 5.0–6.0 mm diameter with white lenticular center which is embedded into a vivid yellowish orange median field. This is followed by a typical black undulate postmedian line and a black straight submarginal line, intermitted by a band in ground colour and followed by the marginal area, again in ground colour. On ventral side wings of similar ground colour, basally to the postmedian lines a little lighter and suffused with light violet hairs. Visible markings are the black forewing ocellus with broad white center, the black forewing postmedian band which ends here costal, around 5 mm from apex, and on the hindwing a small black dot with white lenticular

center indicating the dorsal hindwing ocellus. All dorsal markings are slightly visible as both fore- and hindwings have somewhat transparent character.

♂ **genitalia** (Fig. 20; genitalia no. 1262/05 NAUMANN): Uncus with broad base, only the apical triangular tip is heavily sclerotized and bent downward. Gnathos very typical, with almost rectangular, large ventral process, indented only a little at its dorsal margin. Valves slender, the ventral margin of sacculus and upper ventral margin of the valves with a row of long hairs, dorsal margin very membranous. *A. labriquei* is one of the few species within the genus with secondary reduced internal process of the valves, a variation which is known also from *A. castrensis* SCHAUS, 1898, *A. alticola* LEMAIRE, 1975 or *A. caucensis* LEMAIRE, 1976; only a hinted base of such a process can be found internally near the upper end of the valves. Aedeagus very long and slender, juxta with two small lateral projections (which cannot be seen completely in the figure of the present publication). Aedeagus relatively short and slender as well, vesica emerging on ventral side.

♀ (Figs. 18/19): As typical for the genus, also in this species the ♀♀ show some sexual dimorphism compared to the ♂♂, such as rounder forewings, larger size, and here also some more transparent wings. Both ♀♀ have a different, rusty brown ground colour. Antennae fasciculate, with 28 segments, 8.5 mm long ( $n = 2$ ), ochreous brown. Both known ♀♀ have a Lfw of 37.0 mm. Head and thorax covered with dark brown hair, basally to the forewings there are small tufts of greyish white bristles. Abdomen on dorsal side brownish carmine on the first two segments, posterior to that more greyish, the tip of the last segment with rusty bristles. On ventral side head and thorax dark brown, abdomen again rusty. Forewing in ground colour with same pattern as ♂♂, postmedian band more straight and ending costal 3 mm before apical tip which is pointed a little outward. Basal parts of the hindwing coloured similar to the ♂♂, but the ocellus has a larger diameter of around 8 mm, and its greyish inner part is suffused heavily with white scales. The black postmedian line is not as undulate as in the ♂♂, only slightly indicated as such, the dark submarginal line is greyish instead of black in the ♀. Marginal area again in the rusty brown ground colour, the outer margin with ochreous fringes. Ventral side of wings with same pattern as males, only with different rusty ground colour and higher grade of transparency, so that dorsal markings such as, e.g., hindwing ocellus or postmedian bands can be seen more easily.

**Colour plate 2:** Fig. 10: *Molippa pilarae* n. sp., ♀ allotype, underside. — Figs. 11–12: *Automeris claryi* n. sp., ♂ holotype. Fig. 11: dorsal view. Fig. 12: ventral view. Figs. 13–14: *A. claryi* n. sp., ♀ allotype. Fig. 13: dorsal view. Fig. 14: ventral view. Fig. 15: *A. claryi* n. sp., holotype, ♂ genitalia, prep. no. 1261/05 NAUMANN. — Figs. 16–17: *Automeris labriquei* n. sp., ♂ holotype. Fig. 16: dorsal view. Fig. 17: ventral view. Figs. 18–19: *A. labriquei* n. sp., ♀ allotype. Fig. 18: dorsal view. Fig. 19: ventral view. Fig. 20: *A. labriquei* n. sp., holotype, ♂ genitalia, prep. no. 1262/05 NAUMANN. — Specimens not figured to the same scale. Genitalia preparations figured to the same scale, scale bar = 1.0 mm.



## Additional notes

*A. labriquei* clearly can be confined to LEMAIRE's species-group of *A. cecrops* BOISDUVAL, 1875, subgroup of *A. cecrops*, due to general appearance and, according to LEMAIRE's definition (LEMAIRE 2002: 362), due to the apical ending of the postmedian line. None of the known species show the combination of straight forewing postmedian line and double black rings on hindwing, with one undulated one and a second, straight one. Nearest relatives from superficial pattern are *A. margaritae* LEMAIRE, 1967, *A. descimoni* LEMAIRE, 1972, and *A. lachaumei* LEMAIRE, 2002, from ♂ genitalia structures *A. castrensis* or *A. caucensis*; those two species do not share superficial similarities of their wing pattern.

## Acknowledgements

For their help in various ways during the preparation of this article we would like to thank the following people: "Pepe" José BOTTGER & Pilar BOTTGER CHAVEZ-SILVA (Oaxapampa), Joël CLARY (Lyon), Thibaud DECAËNS (Rouen), Peter KÜPPER (Berlin), Harold LABRIQUE (Lyon), Gerardo LAMAS (Lima), Darren MANN (Oxford), George MCGAVIN (Oxford), Frank MEISTER (Prenzlau), Wolfram MEY (Berlin), Carlos G. C. MIELKE (Carambeí), Richard S. PEIGLER (San Antonio), Viktor SUTER (Zürich), and Kirby L. WOLFE (Escondido).

## References

DOGNIN, P. (1911): Hétérocères nouveaux de l'Amérique du Sud. – Rennes (Imprimerie Oberthur), Fasc. 2: [1]–56.

DRAUDT, M. (1929–1930): 12. Familie: Saturniidae [sic]. – Pp. 713–827, 45 pls. (101–137, 142, 111A, 111B, 117A, 117B, 117C, 117D, 130A) in: A. SEITZ (ed.) (1913–1940), Die Gross-Schmetterlinge der Erde. Eine systematische Bearbeitung der bis jetzt bekannten Gross-Schmetterlinge. Bd. 6, Die Amerikanischen Spinner und Schwärmer. VIII + 1452 pp. text, VIII pp. [index for plates] + pls. 1–185. – Stuttgart (A. Kernen).

GROTE, A. R., & ROBINSON, C. T. (1867): Lepidopterological contributions. – Annals of the Lyceum of Natural History of New York (New York) 8: 351–387, pls. 12–14.

HÜBNER, J. (1816–[“1826”]): Verzeichniss bekannter Schmettlinge. – The author (Augsburg). (Published: 1816: 1–16; [1819]: 17–176; [1820]: 177–208; [1821]: 209–256; [1823]: 257–304; [1825]: 305–431; [1826]: Anzeiger, 1–72 – cf. ICZN: Opinion 150, Direction 4.)

LAMAS, G. (1997): Lepidoptera of the Cordillera del Cóndor. – Pp. 90–93, appendix 15, pp. 212–230 in: L. E. ALONSO, A. ALONSO, T. S. SCHULENBERG & F. DALLMEIER (eds.), The Cordillera del Cóndor Region of Ecuador and Peru: A biological assessment. – Rapid Assessment Program. Working Papers. Smithsonian Institution Monitoring and Assessment of Biodiversity Program (Washington), series 6, vol. 12.

— (2001): Appendix 25. Lepidoptera collected at two sites in the Northern Cordillera de Vilcabamba, Peru. – Pp. 276–278 in: L. E. ALONSO, A. ALONSO, T. S. SCHULENBERG & F. DALLMEIER (eds.), The Cordillera del Cóndor Region of Ecuador and Peru: A biological assessment. – Rapid Assessment Program. Working Papers. Smithsonian Institution

Monitoring and Assessment of Biodiversity Program (Washington), series 6, vol. 12.

—, & GRADOS, J. (2001): Chapter 14. Lepidoptera of the two sites in the Northern Cordillera de Vilcabamba, Peru. – Pp. [147]–148 in: L. E. ALONSO, A. ALONSO, T. S. SCHULENBERG & F. DALLMEIER (eds.), The Cordillera del Cóndor Region of Ecuador and Peru: A biological assessment. – Rapid Assessment Program. Working Papers. Smithsonian Institution Monitoring and Assessment of Biodiversity Program (Washington), series 6, vol. 12.

LEMAIRE, C. (1967a): Description préliminaires d'Attacidae nouveaux d'Amérique du Sud [Lep.] (suite). – Bulletin de la Société entomologique de France (Paris) 71: 217–226.

— (1967b): Description préliminaires d'Attacidae nouveaux d'Amérique du Sud [Lep.] (suite et fin). – Bulletin de la Société entomologique de France (Paris) 71: 298–304.

— (1969): Description de quatre genres nouveaux et d'une espèce inédite d'"Hemileucinae" (Lep. Attacidae). – Lambillionea, Revue bimestrielle (Bruxelles) 68 (7/8): 39–52.

— (1972a): Description d'Attacidae nouveaux d'Amérique centrale et du Sud [Lep.]. – Bulletin de la Société entomologique de France (Paris) 76: 197–207.

— (1972b): Description d'Attacidae (= Saturniidae) nouveaux du Venezuela et du Pérou [Lep.]. – Bulletin de la Société entomologique de France (Paris) 77: 29–41, pl. I–II.

— (1973): Révision du genre *Automeris* HÜBNER et des genres voisins. Biogéographie, éthologie, morphologie, taxonomie (Lep. Attacidae) (Suite). – Mémoires du Muséum National d'Histoire Naturelle (Nouvelle Série), Série A, Zoologie (Paris) 79: [233]–422 [+ 2 pp. without pagination], pls. 30–49.

— (1974): Révision du genre *Automeris* HÜBNER et des genres voisins. Biogéographie, éthologie, morphologie, taxonomie (Lep. Attacidae) (Suite et fin). – Mémoires du Muséum National d'Histoire Naturelle (Nouvelle Série), Série A, Zoologie (Paris) 92: [423]–576 [+ 2 pp. without pagination], pls. 50–61.

— (1975a): Description de neuf Attacidae sud-américains [Lep.]. – Lambillionea, Revue bimestrielle (Bruxelles) 75 (7/8): 55–61.

— (1975b): Description de six Attacidae nouveaux de l'Equateur [Lep.]. – Lambillionea, Revue bimestrielle (Bruxelles) 75bis (Volume Jubilaire 1901–1975): 52–68.

— (1976): Description d'Attacidae inédits de l'Amérique latine [Lep.]. – Lambillionea, Revue bimestrielle (Bruxelles) 76 (3/4): 25–36.

— (1982): Vingt-huit Saturniidae néotropicaux inédits. – Annales de la Société entomologique de France (Paris) (N.S.) 18 (1): 55–88.

— (1988): Description d'Hemileucinae néotropicaux inédits [Lep. Saturniidae]. – Bulletin de la Société entomologique de France (Paris) 92 (7/8): 225–230.

— [with contributions by F. BÉNÉLUZ & N. TANGERINI] (2002): The Saturniidae of America. Les Saturniidae Américains (= Attacidae), vol. 4, Hemileucinae. – Keltern (Goecke & Evers [correct publication date December 6, 2002 according to personal note of the publisher]). – Part A: [1]–688. Part B: [689]–1388; line drawings 1–214, maps 1–185. Part C: pls. 1–126, ES1–ES14, 143 pp. without pagination, 140 figs.

—, & VENEDICTOFF, N. (1989): Catalogue and biogeography of the Lepidoptera of Ecuador. I. Saturniidae. With a description of a new species of *Meroleuca* PACKARD. – Bulletin of the Allyn Museum (Sarasota) 129: [1]–60.

NAUMANN, S., BROSCHE, U., & WENZEL, B. (with contributions by

- R. BRECHLIN & F. MEISTER) (2005): Some new Saturniidae species from Peru (Lepidoptera). – Galathea, Berichte des Kreises Nürnberger Entomologen e. V. (Nürnberg), **Supplement 16**: 81–171.
- RACHELI, L., & RACHELI, T. (2005): A provisional list of the saturniids of Oliva (Muyo area, Department of Amazonas, Peru) with notes on an undetermined female of *Automeris* HÜBNER, [1819] (Lepidoptera: Saturniidae). – SHILAP, Revista de Lepidopterologia (Madrid) **33** (130): 231–234.
- SCHAUS, W. (1898): New species of heterocera from tropical America. – Journal of the New York Entomological Society (New York) **6**: 138–149.
- SCOBLE, M. J. (1992): The Lepidoptera. Form, function and diversity. – London (British Museum (Natural History)) [reprinted 1995 by Oxford University Press (with corrections)], xi + 404 pp., 4 pls.
- WALKER, F. (1855): List of the specimens of lepidopterous insects in the collection of the British Museum (London), part 6, Lepidoptera Heterocera, pp. 1259–1507. – London (Trustees of the British Museum).
- WENCZEL, B., & NAUMANN, S. (2005): New records for the genus *Rothschildia* GROTE, 1897 from Peru and surrounding countries (Lepidoptera, Saturniidae). – Galathea, Berichte des Kreises Nürnberger Entomologen e. V. (Nürnberg), **Supplement 16**: 189–201.

Received: 4. VI. 2005, 8. IX. 2005