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The South Temperate Pronophilina (Lepidoptera: Nymphalidae: Satyrinae):  
revisionary notes and a first phylogenetic hypothesis

by

Jess Matz

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Thesis Committee:

Dr. Andrew V.Z. Brower

Dr. Sarah E. Bergeman

Dr. George W. Benz

This work is dedicated to my daughters. May you both shine without fear.

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## ABSTRACT

This monograph includes an extensive morphological study and redescription of 35 species of south-temperate members of Pronophilina (Nymphalidae: Satyrinae) with illustrations of male genitalia for each included species, a new key, and a systematic revision that combines morphological data with molecular analysis using regions of the mitochondrial COI and COII resulting in a new phylogenetic hypothesis of the group, here named as two infratribes, Neomaeniti and Neosatyriti. Of the 19 genera, 8 have been synonymized with 16 new combinations: *Cosmosatyrus stelligera*, *C. dubii*, *Neomaenas tristis*, *Neosatyrus boisduvalii*, *N. humilis*, *N. schajovskoi*, *N. vesagus*, *Punargentus chiliensis*, *P. monticolens*, *P. tandilensis*, *Pampasatyrus edmondsii*, *P. gustavi*, *Tetraphlebia eleates*, *T. leucoglène*, and *T. patagonica*. *T. eleates* has been promoted from a subspecies of *T. leucoglène* to a valid species and *Neomaenas poliozona reedii* has been raised to a valid subspecies. *Neomaenas monachus limonias* and *Pampasatyrus gustavi penai* have been demoted to subspecies and *Auca nycteropus* and *A. pales* have been synonymized with *A. coctei*. The placement of *Neomaniola euripides*, similar to members of *Neosatyrus*, is discussed, but not formally revised here.

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## LIST OF ABBREVIATIONS

FW - forewing

HW - hindwing

VFW - ventral side forewing

DFW - dorsal side forewing

VHW - ventral side hindwing

DHW - dorsal side hindwing

## Introduction

Of the approximately 6,000 species of nymphalids, 40%, or about 2,400 of the Nymphalidae are satyrines (Robbins, 1982; Peña et. al., 2006). The subfamily Satyrinae contains a wide diversity of butterflies, including the brilliant blue species in the genus *Morpho*. The tribe Satyrini, while not as charismatic as some members of this subfamily, are nonetheless compelling, if for no other reason than because they are a cosmopolitan and diverse group. The satyrines include both tropical and montane species and have been the subject of several higher-level phylogenetic studies using both morphological and, more recently, molecular data (Peña, 2006). Miller's 1968 monograph was the first comprehensive study on relationships of genera within the tribe. Using a non-explicit, narrative analysis of morphological characters, he divided Satyrini into several tribes, later demoted to subtribes, and used this arrangement along with larval feeding habits to derive the origin and biogeographical history of the tribe.

Of these, Miller set apart the tribe Pronophilini (now subtribe Pronophilina) as the most recently-evolved of five endemic South American satyrine subtribes, defined primarily by a Neotropical distribution, forelegs reduced in size and with tarsal segments often fused, and hindwing venation, among other morphological differences. Harvey's (1991) classification of Nymphalidae followed Miller's scheme of satyrine tribes and subtribes, but did not list included genera. A study on the radiation of Satyrini (Peña et al., 2011) suggested that the combination of an ability to feed on grasses and a shift from forested to open habitats by

satyrine progenitors resulted in massive diversification and colonization of new habitats and regions, the ancestors of the Pronophilina migrating southward from North America between 35 and 33mya. A more explicit definition of the Pronophilina would then be a subtribe of Neotropical bamboo and grass-feeding satyrines with highest diversity between 2600-2850m above sea level (Pyrz et al., 2009; Brower, 2011). Vilorio (2003) suggested that a biogeographically and morphologically distinct group of south-temperate South American pronophilines occurring in Chile, Argentina and the altiplano of Bolivia and Peru might be closely related to the New Zealand species of *Argyrophenax*, having been separated from the parent group during the breakup of Gondwanaland ca. 200 mya, rather than dispersing from the Old World by way of the Bering land bridge, as Miller proposed. Vilorio placed these in a clade that he referred to as the Hypocystina, corresponding to the South Pacific tribe Hypocystini *sensu* Miller. The Checklist of Neotropical Butterflies edited by Lamas (2004) reflects Vilorio's arrangement, with several additional genera being placed in the tribe Erebiina. More recently, a study based on DNA sequence data by Peña et al. (2006) supported the monophyly of the south-temperate group as a clade within Pronophilina, but not its Gondwanan origin, rejecting the Hypocystina hypothesis, though with limited sampling. Neosatyriti, from the genus *Neosatyrus*, or the use of another generic name was suggested as a name for this clade, but because names for infratribes have no nomenclatorial standing under the current ICZN code (ICZN, 1999) I have chosen to use new names that are etymologically

appropriate, given the more recent colonization and subsequent speciation suggested by Peña et al. (2006, 2011).

Early revisionary works (Hayward, 1953; Herrera, 1966, 1974; Herrera and Howarth, 1966; Heimlich, 1972) were not explicitly phylogenetic studies, instead focused on description of new genera and species. The proliferation of new genera was so great during the 1950's and 1960's -- eleven of the nineteen under revision here -- that it "has... only added more problems to the general systematics of the South American Satyrids [sic]. Such is the state of chaos that genera come and go almost as quickly as fluctuations in the International Stockmarket" (D'Abrera, 1988, p. 792). Many of these new genera were described on the basis of presumed-distinctive apomorphies, often using only one or two morphological characters of questionable utility at the generic level. In particular, wing venation has long been considered useful in higher-level taxonomic studies (Comstock, 1918; Forbes, 1923; Wootton, 1979; Scoble, 1992), and was used as a defining character for the majority of genera under revision in this study. Herrera (1965) refers to the use of wing venation as important, significant, and fundamental to the establishment of genera. However, it was long ago noted that wing venation, particularly the branching order of the forewing radial veins, is variable within species of the satyrine genus *Erebia* (Warren, 1936). Pyrcz and Wojtusiak (2010) noted that a high degree of individual variation in the position of the forewing radial veins renders this character not useful in defining the genera most closely associated with

*Argyrophorus* (Blanchard, 1852) and, independently of these findings, I discovered that this holds true throughout the clade.

Thorough morphological study has produced informative characters that not only serve to better define genera and allow more precise redescriptions of species, but also to construct the first morphological data matrix and subsequent phylogenetic hypothesis for the south temperate taxa. This study also helped to better inform the construction of a matrix based on mitochondrial and nuclear DNA, ensuring accurate identifications so that a holistic phylogenetic approach combining morphology and molecular data produced the most robust available hypothesis to determine relationships at the generic and specific levels (Miller et al., 1997; Wahlberg et al., 2005). The methods, results and discussion of the phylogenetic analysis are followed in this thesis by revisionary accounts of genera and species studied.

## **Methods**

Specimens were obtained by netting adult butterflies in the field and by borrowing material from the public collections listed in Table 1. Both dried specimens and fresh material collected in the field were used in morphological analysis, with the fresh material spread and dried using standard preparation techniques (Winter, 2000). Male abdomens were removed, cleared using 40% NaOH, and the genitalia removed under a dissecting microscope and preserved in glycerol. Scales were removed from palps and forelegs where necessary. Drawings of genitalia were modified in Photoshop CS4 from digital photographs

taken through a Leica DML compound microscope, or using camera lucida with a Leica MZ8 dissecting microscope. All other drawings were made using camera lucida and enhanced with Photoshop. Photographs of wings were made with a Nikon D5000 digital camera at high resolution. Characters and character states are listed in Table 2.

<i>Table 1: Collections from which specimens were examined or borrowed for this study. The indicated abbreviations are employed in the text.</i>
BMNH - Natural History Museum, London, UK (formerly British Museum of Natural History)
CU - Cornell University Insect Collection, Ithaca, NY
FML, Tucumán - Fundación Miguel Lillo, Tucumán, Argentina
MACN - Museo Argentino de Ciencias Naturales, Buenos Aires, Argentina
MFN, Berlin - Museum für Naturkunde, Berlin, Germany
MGCL - McGuire Center for Lepidoptera and Biodiversity at the Florida Museum of Natural History, University of Florida, Gainesville, FL
MNHN, Paris - Musée National d'Histoire Naturelle, Paris, France
MNHN, Santiago de Chile - Museo Nacional de Historia Natural, Santiago de Chile
MP, São Paulo - Museu Paulista, Universidade da São Paulo, São Paulo, Brazil
NRM, Stockholm - Naturhistoriska Riksmuseet, Stockholm, Sweden
OSU - Oregon State University, Corvallis, OR
UJ - Uniwersytet Jagielloński, Kraków, Poland
ZSM - Zoologischen Staatssammlung, Munich, Germany

Individual specimens for molecular analysis were collected in the field by the author and colleagues, and preserved in EtOH or dried until DNA could be extracted. Genomic DNA was extracted from thoraces or legs following standard protocols (e. g., Brower et al., 2006), and stored at  $-80^{\circ}\text{C}$ . Because the aim was to test species boundaries by sampling multiple individuals of several variable taxa, mitochondrial COI and COII were selected as the primary source of molecular characters for this study. These gene regions have proven efficacious in revealing phylogenetic and population structure in many other nymphalid taxa (e.g., Brower, 1994; Wahlberg et al., 2003). The sequences were amplified via the polymerase chain reaction (PCR) using primers and cycling profiles from Brower & Jeansonne (2004) and Brower et al. (2006). Amplified DNA fragments were purified with Qiaquick PCR purification kits, cycle sequenced, and sequenced with a BioRad 373 automated sequencer for both sense and antisense strands.

Resultant DNA sequences were aligned by eye (there were no gaps), and compiled into a NEXUS-formatted data matrix of 2369 aligned bp plus 71 morphological characters for analysis in PAUP\* 4.0b10 (Swofford, 2000). The matrix was examined for pairwise similarity and 18 redundant, identical taxa were removed from subsequent analyses. The data matrix analyzed included 71 ingroup taxa and five putative outgroup pronophiline taxa (*Lymanopoda ferruginosa* Butler, *Manerebia leaena* (Hewitson), *Pronophila orcus* (Latreille), *Idioneurula eremita* Pyrcz & Vilorio, *Steroma bega* Westwood) and was rooted

with the non-pronophiline satyrine *Cercyonis pegala* (Fabricius). Sequences for most taxa spanned the entire COI-COII gene region, but some individuals were sequenced only for COI, or for the 3' end of COI and COII. The morphological data matrix, comprising 71 multistate characters was concatenated with the molecular data and analyzed as a single partition. Species for which multiple individuals were sequenced were given an identical set of morphological data. Parsimony analyses were conducted with all characters weighted equally.

### Phylogenetic Results

Ten equal-weighted heuristic searches resulted in discovery of 16206 trees of length 3471 steps (C. I. 0.3884; R. I. = 0.7056), the strict consensus of which is shown in Fig. 0-1. This consensus tree indicates that the south temperate pronophilines, referred to as Hypocystina by Vilorio (2003) and Lamas (2004) do not compose a single monophyletic group, but instead fall into two clades within the diverse satyrine subtribe Pronophilina. The bulk of the genera, including *Argyrophorus*, *Auca*, *Cosmosatyrus*, *Elina*, *Neomaenas*, *Punargentus*, and *Pampasatyrus*, fall into one monophyletic group, henceforth the infratribe Neomaeniti after the largest genus, *Neomaenas*. However, *Tetraphlebia*, *Nelia*, and *Neosatyrus* were found to belong to a clade including extralimital, Andean *Diaphanos* Adams & Bernard, *Ianussiusa* Pyrcz & Vilorio, *Idioneurula* Strand, *Lymanopoda* Westwood, *Manerebia* Staudinger, *Sabatoga* Staudinger, and *Tamania* Pyrcz (referred to as subtribe Erebiina by Vilorio (2003) and Lamas (2004)). This group of genera form the infratribe Neosatyriti, after *Neosatyrus*.

The phylogenetic position of both of these clades within Pronophilina has been corroborated by more extensive analyses of molecular data for Satyrinae that includes a broader representation of pronophiline taxa ( Peña et al., 2006; Wahlberg et . al., 2009; A. Brower, pers. comm.).

### **Discussion**

While morphological data on their own proved to be insufficient to resolve problems with generic placement in a phylogenetic analysis, the data were either co-supportive of or at least not detrimental to patterns implied by molecular data in a combined analysis. However, a thorough understanding of anatomical and wing patterning differences both served to resolve numerous misidentifications of voucher specimens as well as to help form a syndrome of characters that accurately describes genera in order to place species for which fresh material was not available for DNA extraction and therefore were not included in the combined analysis. Furthermore, since this is the first phylogenetic analysis of this infratribe and the first thorough investigation of morphology within this group since the pre-cladistic revisionary works (e. g., Hayward, 1953; Herrera, 1966; 1974; Herrera and Howarth, 1966; Heimlich, 1972) in which many of the now synonymized genera were described, the value of certain characters could be reassessed with their worth as informative characters in a data matrix in mind. When forewing venation was evaluated, radial vein positioning was found to be non-informative and highly variable amongst individuals of the same species while the relative distances between M1-M2 and M2-M3 were both consistent

within each species and variable enough between species to be useful in distinguishing members of *Neosatyrus*, *Cosmosatyrus*, and *Neomaenas*. The position of forewing cubital veins showed no notable difference between species. Other venation characters, such as the shape of the forewing discal cell and the positions of median veins on the hindwing might also prove to be informative in future analyses. Hindwing shape, particularly in the excavation between the anal vein and the tornus and in the crenation of the termen, distinguished *Neosatyrus* and *Auca*, *Elina*, and *Nelia*, respectively.

Wing patterning comprised a large portion of the morphological data matrix, particularly in the ventral hindwing coloration and patterning, which has been diagnostic for species within this group since the original descriptions were written. Well-developed dorsal ocelli on the forewings between M1-M3 were a synapomorphy for *Pampasatyrus*. A ripple pattern, striations of darker scales superimposed over other design elements, distinguished members of *Auca*, *Cosmosatyrus*, *Elina*, and *Nelia*. Shape and color of the ventral hindwing postmedian band was diagnostic for almost every species. Number, placement, color, size, and shape of the ocelli within this band varied widely throughout the group, but were sufficiently consistent within species to be diagnostic. Members of *Cosmosatyrus* showed ocelli in each cell of the ventral hindwing, while members of *Tetraphlebia* had none at all.

Segmentation of the foreleg tarsi in males and females was found to be both consistent within a species and variable between species, members of all

but *Cosmosatyrus*, *Neomaenas*, *Nelia*, *Tetraphlebia*, *Elina*, and *Neosatyrus* with the tarsal segments fused into a club-like appendage. Relative tarsal/femoral length and relative length of the entire foreleg in males and females might also be useful. *Pampasatyrus* shows extreme foreleg reduction, but significant, though subtler, differences may appear in the relative total foreleg length of other genera or between species. The presence or absence of setae on the eyes (hairy or naked eyes) was found to be interspecifically variable and would also be useful in a future morphological analysis. Both species of *Elina* have hairy eyes, as do some members of *Neomaenas*.

Male genitalia provided several synapomorphies, such as the ornamentation on the aedeagus in *Argyrophorus* and *Pampasatyrus*, truncate shape of the saccus as in *Nelia*, and narrowing of the uncus just distal to the tegumen as in *Punargentus*. A wide pedunculus and long saccus helped to distinguish members of *Tetraphlebia* and the general shape of the valva was diagnostic for most genera. Female genitalia were neglected but may provide additional informative characters.

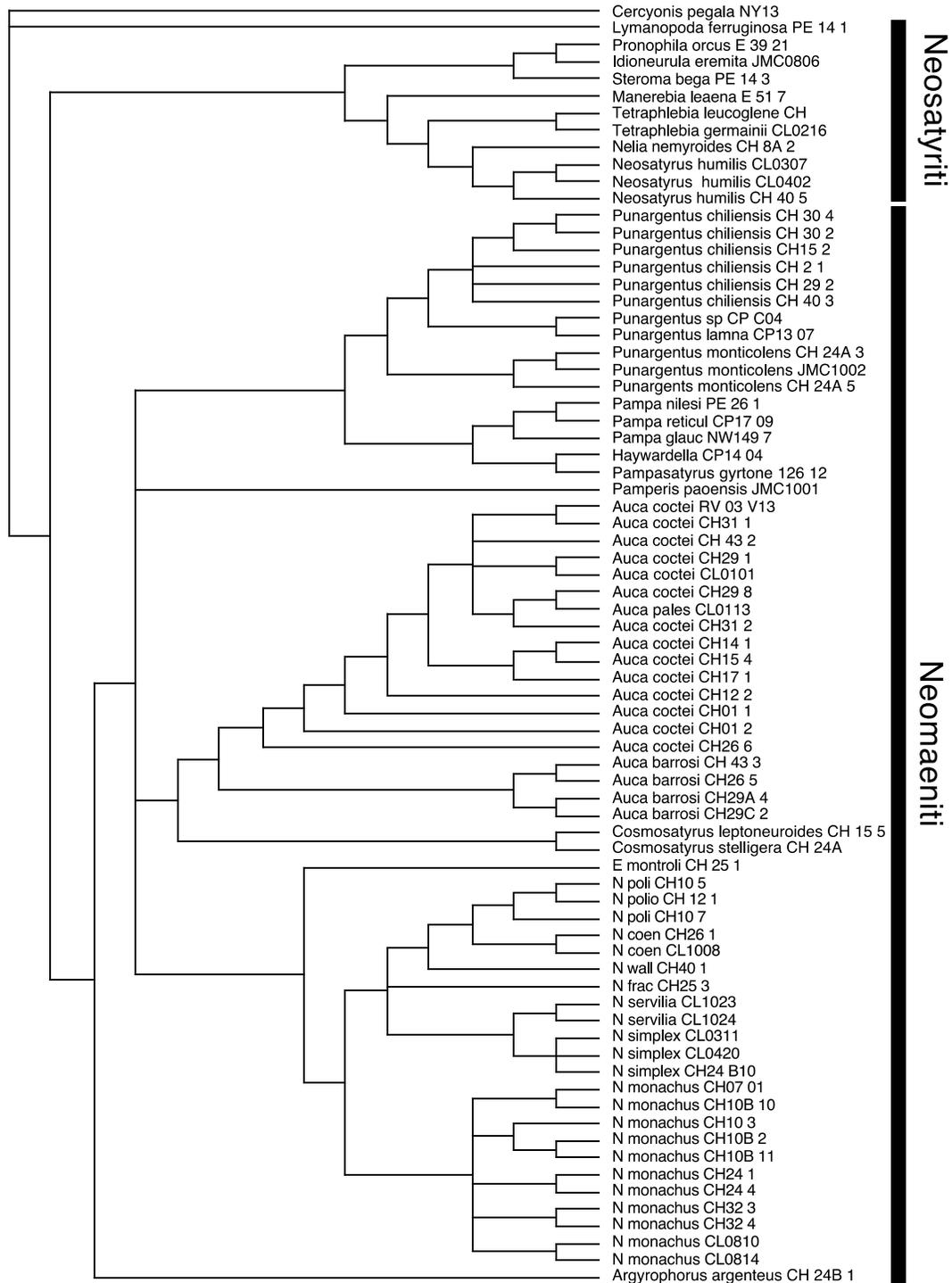


Figure 0-1: Strict consensus tree from combined morphological and molecular data

Table 2: Morphological characters coded in the analysis of the south-temperate Pronophilina.

Related body parts have been grouped together and characters coded as multistate are unordered in this analysis.

1. VFW R5-M1 spot 0= absent 1= present
2. VFW M1-M2 ocellus 0= absent 1= present
3. VFW M1-M2 ocellus yellow/yellow-orange ring 0= absent 1= present
4. VFW M1-M2 ocellus pupil 0= absent 1= present
5. VFW M1-M2 ocellus pupil 0= single 1= double
6. VFW M1-M2 ocellus extending to M3 0= no 1= yes
7. VFW M2-M3 ocellus distinct from M1-M2 ocellus 0= no 1= yes
8. VFW CuA1-CuA2 spot 0= absent 1= present
9. VFW CuA1-CuA2 spot yellow ring 0= absent 1= present
10. VFW CuA1-CuA2 spot pupil 0= absent 1= present
11. VFW postmedian band 0= absent 1= present
12. VFW postmedian band edged in dark walnut brown to black, 0= no 1= somewhat 2= completely
13. VFW ripple pattern 0= absent 1= present
14. DFW silver 0= no 1= yes
15. DFW M1-M2 ocellus 0= absent 1= not a clear or distinct ocellus 2= clear and distinct ocellus
16. VHW Rs-M1 ocellus 0= absent 1= present
17. VHW Rs-M1 ocellus 0= white 1= yellow 2= black
18. VHW Rs-M1 ocellus pupil 0= absent 1= present
19. VHW Rs-M1 ocellus yellow ring 0= absent 1= present
20. VHW Rs-M1 ocellus 0= round 1= lenticular 2= linear
21. VHW M1-M2 ocellus 0= absent 1= present
22. VHW M1-M2 ocellus 0= white 1= yellow 2= black
23. VHW M1-M2 ocellus pupil 0= absent 1= present
24. VHW M1-M2 ocellus yellow ring 0= absent 1= present
25. VHW M1-M2 ocellus 0= round 1= lenticular 2= linear
26. VHW M2-M3 ocellus 0= absent 1= present
27. VHW M2-M3 ocellus 0= white 1= yellow 2= black
28. VHW M2-M3 ocellus pupil 0= absent 1= present
29. VHW M2-M3 ocellus yellow ring 0= absent 1= present
30. VHW M2-M3 ocellus 0= round 1= lenticular 2= linear
31. VHW M3-CuA1 ocellus 0= absent 1= present
32. VHW M3-CuA1 ocellus 0= white 1= yellow 2= black
33. VHW M3-CuA1 ocellus pupil 0= absent 1= present
34. VHW M3-CuA1 ocellus yellow ring 0= absent 1= present
35. VHW M3-CuA1 ocellus 0= round 1= lenticular 2= linear
36. VHW CuA1-CuA2 ocellus 0= absent 1= present
37. VHW CuA1-CuA2 ocellus 0= white 1= yellow 2= black
38. VHW CuA1-CuA2 ocellus pupil 0= absent 1= present
39. VHW CuA1-CuA2 ocellus yellow ring 0= absent 1= present
40. VHW CuA1-CuA2 ocellus 0= round 1= lenticular 2= linear
41. VHW CuA2-1A+2A ocelli 0= absent 1= present
42. VHW CuA2-1A+2A ocelli 0= single 1= double
43. VHW postmedian band proximal edge 0= absent/indistinct 1= entire 2= sinuous 3= dentate/scalloped 4= deckle-edged 5= series of chevrons

Table 2. (Continued)

44. VHW postmedian band distal edge 0= absent/indistinct 1= entire 2= deckle-edged 3= series of chevrons
45. VHW postmedian band color 0= brown 1= white/cream 2= yellow 3= lavender/purple
46. VHW M2-M3 triangle 0=absent 1=present
47. VHW M2-M3 triangle 0= indistinct from postmedian band proximal edge 1= distinct from postmedian band proximal edge
48. VHW ripple pattern 0= absent 1= present
49. FW termen 0= entire 1= crenate
50. FW distance from M1-M2 0= less than 1= greater than distance from M2-M3
51. FW (male) androconia 0= absent 1= present
52. HW termen 0= entire 1= barely crenate 2= crenate
53. HW inner margin excavated between 1A+2A and anal vein 0= no 1= yes
54. HW CuA1 0= less than 1= greater than 1.5 times M2-M3
55. VHW veins 0= not white 1= white
56. Palps 2nd segment 0= less than 1= greater than 5 times length 3rd segment
57. Palps terminal segment 0= conical 1=cylindrical 2= round
58. Foreleg tarsi (male) 0= five 1= four 2= three 3= two 4= one segment(s)
59. Foreleg tarsi (male) 0= with 1= without spines
60. Foreleg tarsi (female) 0= five 1= four 2= three 3= two 4= one segment(s)
61. Foreleg tarsi (female) 0= with 1= without spines
62. Midleg, hindleg spines 0= amber 1= dk amber 2= black
63. Antennae club 0= spatulate 1= round
64. Aedeagus 0= smooth 1= serrate
65. Aedeagus shape 0= tapering toward proximal end 1= narrowing then widening (hourglass shape) 2= even in width 3= widest at proximal end
66. Uncus shape 0= narrow, almost equal in width throughout 1= wide, tapering gradually toward distal end 2= widening at median
67. Saccus shape 0= U-shaped 1= truncate 2= deltoid
68. Pedunculus shape 0= U-shaped 1= attenuating 2= deltoid/wide
69. Valva dorsal fold to proximal end 0= greater than 1= less than half total length
70. Valva dorsal edge 0= smooth 1= serrate
71. Valva distal end shape 0= acute 1= deltoid 2= U-shaped

Table 3. Summary classification of the species examined in *the Pronophilina (Lepidoptera: Nymphalidae: Satyrinae)* as proposed by Lamas and Vilorio (2004), updated with taxa published subsequently, and as revised here (taxa whose nomenclatural status is changed here are indicated in bold. Names underlined in the left column have been synonymized (see details in text).

Lamas & Vilorio (2004)	This study
Subtribe Hypocistina	<b>Subtribe Pronophilina</b>
	<b>Infratribe Neomaeniti</b>
<i>Argyrophorus</i> Blanchard, 1852	<i>Argyrophorus</i> Blanchard, 1852
<i>argenteus</i> Blanchard, 1852	<i>argenteus</i> Blanchard, 1852
<i>blanchardi</i> Pyrcz & Wojtusiak, 2010	<i>blanchardi</i> Pyrcz & Wojtusiak, 2010
<i>Auca</i> Hayward, 1953	<i>Auca</i> Hayward, 1953
<i>barrosi</i> (Silva, 1917)	<i>barrosi</i> (Silva, 1917)
<i>coctei</i> (Guérin-Méneville, [1838])	<i>coctei</i> (Guérin-Méneville, [1838])
<u><i>nycteropus</i></u> (Reed, 1877)	<i>Cosmosatyrus</i> C. Felder & R. Felder, 1867
<u><i>pales</i></u> (Philippi, 1859)	<b><i>dubii</i> (Pyrcz, 2012)</b>
<u><i>Chillanella</i></u> Herrera, 1966	<i>leptoneuroides</i> C. & R. Felder, 1867
<b><i>stelligera</i> (Butler, 1881)</b>	<b><i>stelligera</i> (Butler, 1881)</b>
<i>Cosmosatyrus</i> C. Felder & R. Felder, 1867	<i>Elina</i> Blanchard, 1852
<i>leptoneuroides</i> C. & R. Felder, 1867	<i>montrolii</i> (Feisthamel, 1839)
<i>Elina</i> Blanchard, 1852	<i>vanessoides</i> Blanchard, 1852
<i>montrolii</i> (Feisthamel, 1839)	<i>Neomaenas</i> Wallengren, 1858
<i>vanessoides</i> Blanchard, 1852	<i>coenonymphina</i> Butler, 1881
<u><i>Etcheverrius</i></u> Herrera, 1965	<i>edmondsii</i> (Butler, 1881)
<b><i>chiliensis</i> (Guérin-Méneville, [1830])</b>	<i>fractifascia</i> Butler, 1881

- tandilensis* (Köhler, 1935)**
- inornata* Elwes, 1903
- monachus* (Blanchard, 1852)**
- poliozona* (C. & R. Felder, 1867)
- servilia* Wallengren, 1858
- simplex* (Butler, 1881)
- tristis* (Guérin-Méneville, [1830])**
- wallengrenii* Butler, 1881
- Haywardella* Herrera, 1966
- edmondsii* (Butler, 1881)**
- Pampasatyris* Hayward, 1953
- Homoeonympha* C. Felder & R. Felder, 1867
- edmondsii* (Butler, 1881)**
- boisduvalii* (Blanchard, 1852)**
- glaucope* (C. & R. Felder, 1867)
- humilis* (C. Felder & R. Felder, 1867)**
- gyrtone* (Berg, 1877)
- schajovskoi* Hayward, 1954**
- imbrialis* (A. G. Weeks, 1901)
- vesagus* (Doubleday, [1849])**
- nilesi* (A. G. Weeks, 1901)
- Nelia* Hayward, 1953
- ocelloides* (Schaus, 1902)
- calvertii* (Elwes, 1903)
- periphas* (Godart, [1824])
- nemyroides* (Blanchard, 1852)
- quies* (Berg, 1877)
- Neomaenas* Wallengren, 1858
- yacantoensis* (Köhler, 1939)
- coenonymphina* Butler, 1881
- Pamperis* Heimlich, 1959
- edmondsii* (Butler, 1881)**
- poaeneis* Heimlich, 1959
- fractifascia* Butler, 1881
- Punargentus* Heimlich, 1963
- inornata* Elwes, 1903
- angusta* (Weymer, 1911)
- poliozona* (C. Felder & R. Felder, 1867)
- chiliensis* (Guérin-Méneville, [1830])**
- servilia* Wallengren, 1858
- gustavi* (Staudinger, 1898)**
- simplex* (Butler, 1881)
- lamna* (Thieme, 1904)
- wallengrenii* Butler, 1881
- monticolens* (Butler, 1881)**
- Neosatyris* Wallengren, 1858
- tandilensis* (Köhler, 1935)**
- ambiorix* Wallengren, 1858
- Stuardosatyris* Herrera & Etcheverry, 1965

*williamsianus* (Butler, 1868)

Palmaris Herrera, 1965

*antarcticus* (Mabille, 1885)

***gustavi* (Staudinger, 1898)**

***monticolens* (Butler, 1881)**

*penai* (Hayward, 1967)

Pampasatyrus Hayward, 1953

*glaucope* (C. Felder & R. Felder, 1867)

*gyrtone* (Berg, 1877)

*imbrialis* (A. G. Weeks, 1901)

*nilesi* (A. G. Weeks, 1901)

*ocelloides* (Schaus, 1902)

*periphas* (Godart, [1824])

*quies* (Berg, 1877)

*reticulata* (Weymer, 1907)

*yacantoensis* (Köhler, 1939)

Pamperis Heimlich, 1959

*poaeneis* Heimlich, 1959

Punargentus Heimlich, 1963

*angusta* (Weymer, 1911)

*lamna* (Thieme, 1904)

Quilaphoetus Herrera, 1966

*janirioides* (Blanchard, 1852)

***monachus* (Blanchard, 1852)**

Spinantenna Hayward, 1953

***tristis* (Guérin-Méneville, [1830])**

*Tetraphlebia* C. Felder & R. Felder, 1867

*germainii* C. Felder & R. Felder, 1867

Subtribe Erebiina

*Neomaniola* Hayward, 1949

*euripides* (Weymer, 1890)

*Stuardosatyrus* Herrera & Etcheverry 1965

*williamsianus* (Butler, 1868)

**Infratribe Neosatyriti**

*Nelia* Hayward, 1953

*calvertii* (Elwes, 1903)

*nemyroides* (Blanchard, 1852)

*Neosatyrus* Wallengren, 1858

*ambiorix* Wallengren, 1858

***boisduvalii* (Blanchard, 1852)**

***humilis* (C. & R. Felder, 1867)**

***schajovskoi* Hayward, 1954**

***vesagus* (Doubleday, [1849])**

*Tetraphlebia* C. & R. Felder, 1867

***eleates* (Weymer, 1890)**

*germainii* C. & R. Felder, 1867

***leucoglene* (C. & R. Felder, 1867)**

***patagonica* (Mabille, 1885)**

Wing venation of the Neomaeniti

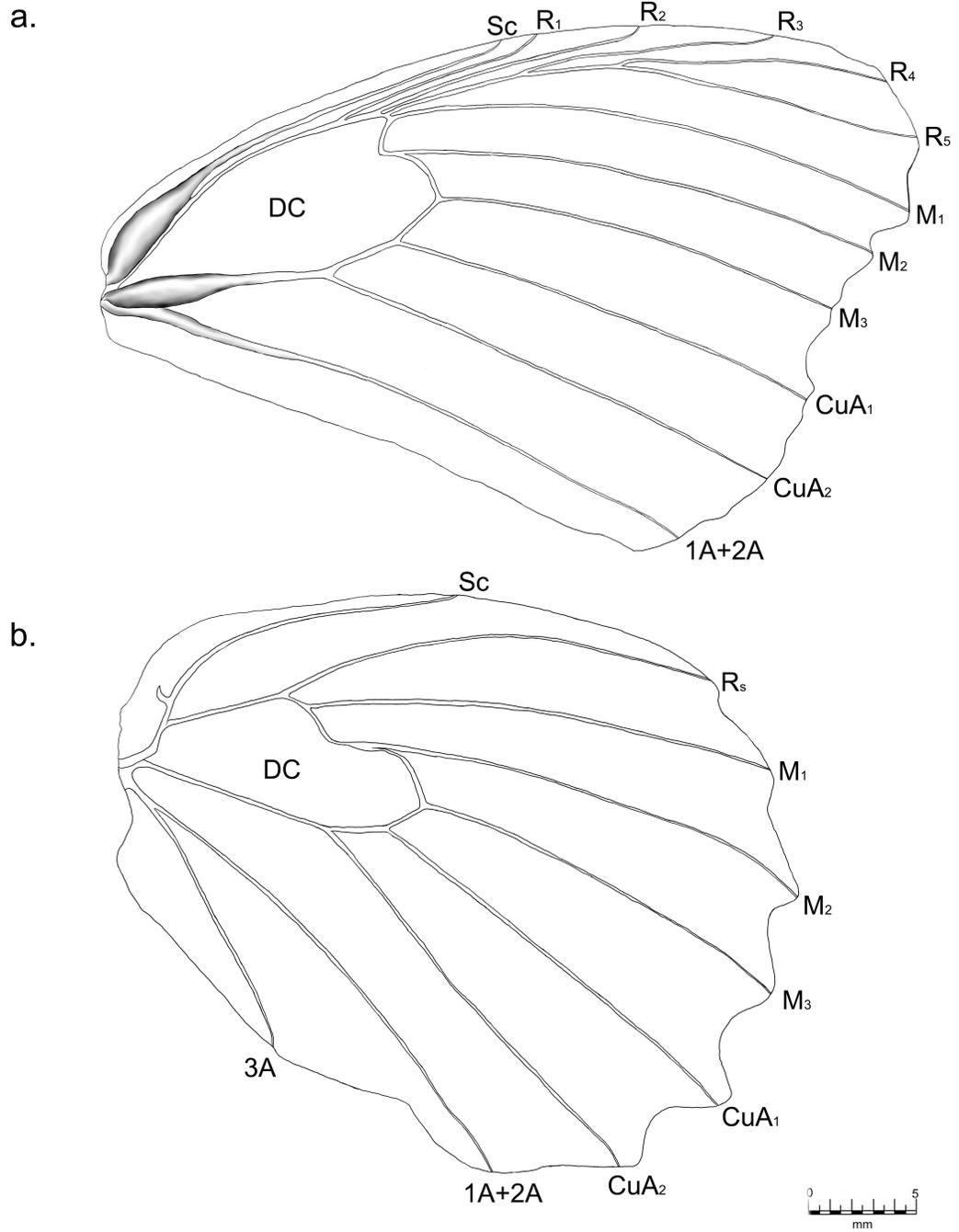


Figure 0-2. Wing venation scheme for (a) forewing and (b) hindwing using *Elina montrolii*

OSU#93698

## Foreleg segmentation in the Neomaeniti and Neosatyriti

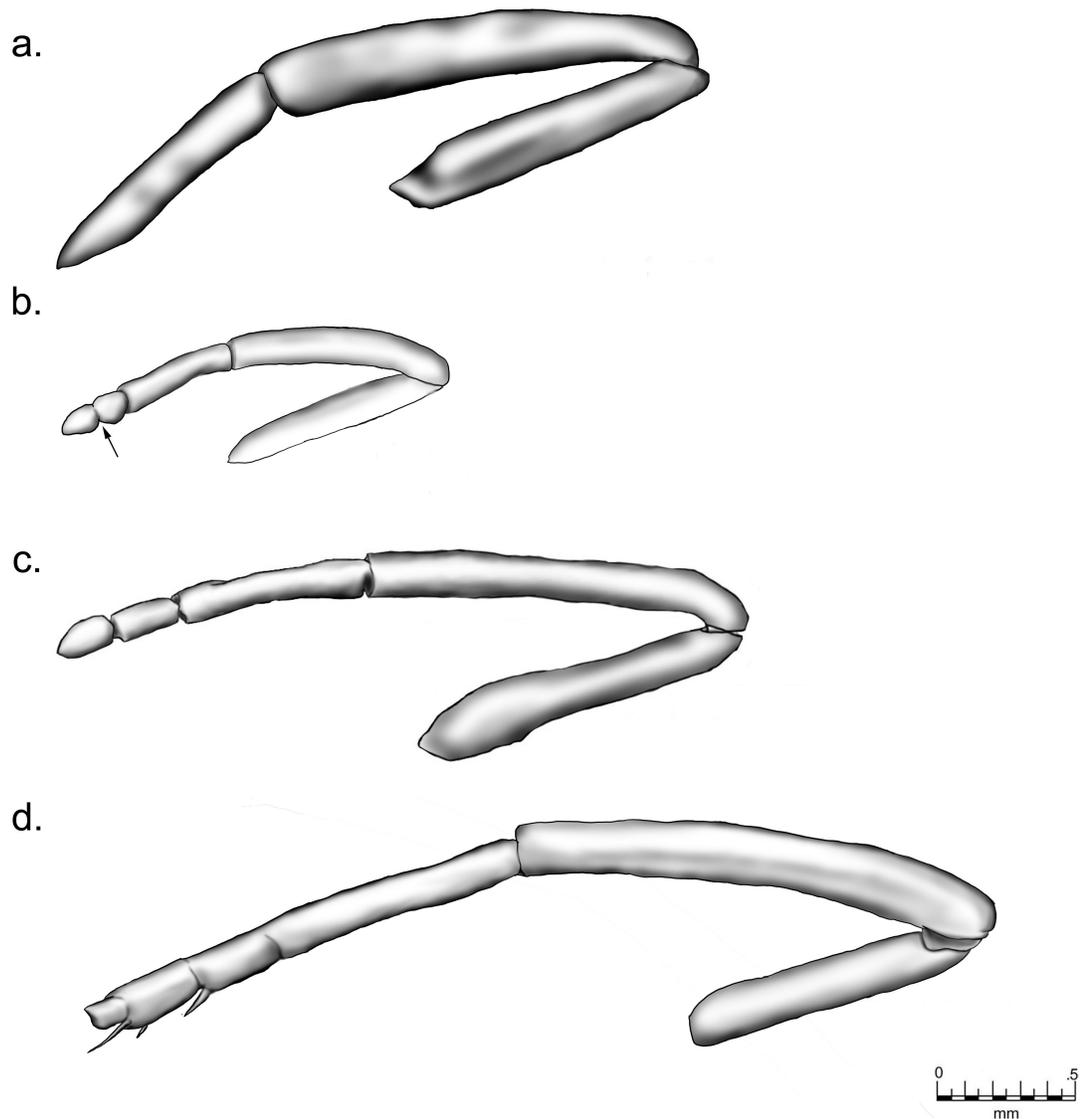


Figure 0-3. Examples of foreleg segmentation in the Neomaeniti and Neosatyriti of (a) a male *Argyrophorus argenteus*, (b) a male *Tetrablebia leucoglene*, (c) a male *Cosmosatyrus dubii*, and (d) a female *Elina montrolii* showing varying degrees of segmentation and pseudosegmentation in (b), indicated by the arrow.

### Key to Neomaeniti and south-temperate Neosatyriti

1.
  - a. Outer margin of the hindwing entire - 2
  - b. Outer margin of the hindwing scalloped or only barely so - 8
2.
  - a. Underside of the hindwing with a series of ocelli along the postmedian band - 3
  - b. Hindwing without ocelli along the postmedian band - *Tetraphlebia*, 31
3.
  - a. Dorsal forewing silver - *Punargentus lamna*
  - b. Dorsal forewing brown or brown with rust-colored patches - 4
4.
  - a. Pupillated ocellus visible on the dorsal side of the forewing at the apex between M1-M3 - *Pampasatyrus*, 36
  - b. No ocellus visible on the dorsal side of the forewing, or dorsal forewing ocellus not pupillated - 5
5.
  - a. Ventral forewing lacking ocelli - *Pamperis poaeneis*
  - b. Ventral forewing with an ocellus at the apex or both at the apex and along the postmedian band - 6
6.
  - a. Dorsal wings coppery with the forewing costa white, ventral forewing M1-M2 ocellus oval, hindwing ocelli lenticular and not ringed in yellow - *Stuardosatyrus williamsianus*
  - b. Dorsal wings not coppery, ventral forewing apical ocellus round and sometimes extending beyond M1-M2, hindwing ocelli round - 7
7.
  - a. Antennae clubs spatulate, ventral forewing ocellus bipupillate and ringed in yellow, Distal end of the forewing discal cell V-shaped or shallowly sinuous, hindwing trapezoidal or rectangular, males with or without androconia - *Neosatyrus*, 23
  - b. Antennae clubs spatulate or round, ventral forewing apical M1-M3 ocelli fused at M2 with one or two pupils, distal end of the forewing discal cell deeply sinuous, hindwing oval, males without androconia - *Cosmosatyrus*, 40
8.
  - a. Dorsal side of both wings silver - *Argyrophorus argenteus*
  - b. Dorsal side of both wings brown or brown with rust-colored patches - 9
9.
  - a. Bipupillate M1-M3 ocellus clearly visible on the dorsal side of the forewing - *Pampasatyrus*, 28

- b. Dorsal forewing M1-M3 ocellus absent or present as a black patch, bearing a single or no pupil - 10
10. a. Ventral forewing M1-M3 ocellus unpupillated, hindwing oval with a margin not excavated between anal vein and 1A+2A, ventral hindwing ocelli lenticular and present in each cell along the postmedian band - *Punargentus*, 26
- b. Hindwing trapezoidal with an inner margin excavated between the anal vein and 1A+2A, ventral hindwing ocelli round or absent - 11
11. a. Larger specimen, wing greater than 18mm at the forewing inner margin, dorsal forewing discal cell and postmedian band clearly visible and rust colored, dorsal forewing M1-M3 ocellus an indistinct black to dark brown patch, outer margin of the hindwing clearly scalloped - *Elina*, 33
- b. Medium to small specimen, wing less than 18mm at the forewing inner margin, discal cell and post median band may or may not be rust-colored and visible on the dorsal side of the forewing, dorsal forewing M1-M3 ocellus absent or present as a round spot with or without a pupil, hindwing scalloped or barely so - 12
12. a. Ventral forewing M1-M3 ocellus without a pupil or unipupillate, postmedian band roughly triangular, bright orange, and not extending beyond the anal vein, males with heavy androconia visible on the dorsal forewing - *Nelia*, 34
- b. Ventral forewing with one or two pupils in the M1-M3 ocellus, postmedian band extending beyond the anal vein where present, males may or may not bear androconia - 13
13. a. Smaller specimen, less than 13mm at the inner margin of the forewing, ventral forewing M1-M3 ocellus bipupillate and ringed in yellow, males with heavy androconia visible and without a rust patch over the discal cell on the dorsal forewing - *Auca*, 35
- b. Medium-sized specimen, 13-18 mm at the inner margin of the forewing, ventral forewing M1-M3 ocellus single or bipupillate, male dorsal forewings with or without androconia or rust patch over the discal cell - 14
14. a. Ventral forewing ocellus bipupillate and ringed in yellow, absent in some specimens from Magallanes provence, Chile. Ventral forewing with rust-colored patch over the discal cell, extending to the postmedian band. Ventral hindwing yellow along the proximal edge of the postmedian band and with veins highlighted in white. Ventral hindwing ocelli in each cell between M2 and CuA1 round

and white; ocelli between M1-M2 and CuA1-CuA2 round, black, unipupillate, and ringed in yellow. Males with androconia - *Cosmosatyrus leptoneuroides*

- b. Not exactly as above, males usually without androconia - *Neomaenas*, 15
15.
    - a. Ventral hindwing with a streak of yellow across the discal cell - 16
    - b. Discal cell of the ventral hindwing without yellow streak - 19
  16.
    - a. Inner margin of the hindwing clearly excavated between anal vein and 1A+2A - 17
    - b. Inner margin of the hindwing barely or not excavated between anal vein and 1A+2A - 18
  17.
    - a. Ventral hindwing with the postmedian band edged strongly in white and with ocelli round and present in each cell between Rs and CuA1 - *Neomaenas servilia*
    - b. Ventral hindwing with the postmedian band not edged in white and ocelli not present in all cells between Rs and CuA1 - *Neomaenas fractifascia*
  18.
    - a. Ventral hindwing veins white - *Neomaenas wallengrenii*
    - b. Ventral hindwing veins not white - *Neomaenas edmondsii*
  19.
    - a. Ventral hindwing with a clear yellow or white triangle between M2-M3 - 20
    - b. Ventral hindwing without a yellow or white triangle between M2-M3 - 21
  20.
    - a. Ventral hindwing without a distinct postmedian band - *Neomaenas simplex*
    - b. Ventral hindwing with a distinct postmedian band - *Neomaenas tristis*
  21.
    - a. Outer margin of the hindwing clearly scalloped, males with androconia - *Neomaenas monachus*
    - b. Outer margin of the hindwing only barely scalloped, males without androconia - 22
  22.
    - a. Ventral hindwing postmedian band yellow - *Neomaenas coenonymphina*
    - b. Ventral hindwing postmedian band purple - *Neomaenas poliozona*
  - 23.

- a. Ventral hindwing postmedian band not visible or barely visible, ventral wings without ripple patterning - 24
  - b. Ventral hindwing postmedian band visible, ventral wings with ripple patterning - 25
- 24.
- a. Ventral forewing M1-M3 apical ocellus much reduced; ventral hindwing with ocelli between Rs and 1A+2A small and white and with no postmedian band; males without androconia - *Neosatyrus humilis*
  - b. Ventral forewing M1-M3 ocellus strong, round, black, bipupillate, and ringed in yellow; ventral hindwing ocelli between M3 and CuA2 strongly black and pupillated; ventral hindwing postmedian band may be outlined; males with androconia - *Neosatyrus ambiorix*
- 25.
- a. Ventral forewing with rust patch over the discal cell and with the proximal edge of the postmedian band clearly marked and deckle-edged - *Neosatyrus boisduvalii*
  - b. Ventral forewing without rust patch over the discal cell and with the postmedian band not clearly marked nor deckle-edged - *Neosatyrus shajovskoi*
- 26.
- a. Ventral hindwing lacking ocelli - *Punargentus tandilensis*
  - b. Ventral hindwing with ocelli - 27
- 27.
- a. Antennae with clubs round, black ventral hindwing ocelli completely circumscribed in yellow - *Punargentus monticolens*
  - b. Antennae with clubs spatulate, black ventral hindwing ocelli not completely circumscribed in yellow - *Punargentus chiliensis*
- 28.
- a. Ventral hindwing lacking ocelli along the postmedian band - *Pampasatyus edmondsii*
  - b. Ventral hindwing with ocelli - 29
- 29.
- a. Dorsal and ventral forewing ocelli with blue pupils, rare specimen - *Pampasatyus glaucope*
  - b. Dorsal and ventral forewing ocelli with white pupils - 30
- 30.
- a. Ventral hindwing with round ocelli clearly visible in each cell between Rs and 1A+2A - *Pampasatyus gyrtone*
  - b. Ventral hindwing with lenticular ocelli in each cell between Rs and M2 - *Pampasatyus quies*
- 31.
- a. Strong, white ventral hindwing postmedian band - *Tetraphlebia germainii*

- b. Ventral hindwing postmedian band brown - 32
- 32.
  - a. Ventral forewing M1-M2 ocellus with an overly large pupil - *Tetraphlebia leucoglène*
  - b. Ventral forewing M1-M2 ocellus with a single small ocellus - *Tetraphlebia eleates*
- 33.
  - a. Large specimen, wingspan greater than 52mm at the inner margin of the forewing, without ocelli on the ventral hindwing - *E. montrolii*
  - b. Smaller specimen, wingspan less than 40mm at the inner margin of the forewing, ocelli present on the ventral hindwing between Rs-M1, M1-M2, CuA1-CuA2, CuA2-1A+2A and occasionally between M2-M3 - *Elina vanessoides*
- 34.
  - a. Darker brown, forewing termen nearly straight or obviously concave, males with ventral forewing ocellus lacking a yellow ring, females with dorsal forewing postmedian band wide and triangular - *Nelia nemyroides*
  - b. Lighter brown, forewing termen only slightly concave, males with ventral forewing ocellus ringed in yellow, females with dorsal forewing postmedian band comma-shaped and bearing ocelli between M3-CuA1 and CuA1-CuA2 - *Nelia calvertii*
- 35.
  - a. Ventral hindwing postmedian band irregularly scalloped at the proximal edge - *Auca coctei*
  - b. Ventral hindwing postmedian band smoothly sinuous at the proximal edge - *Auca barrosi*
- 36.
  - a. Ventral hindwing without obvious ocelli and with the white postmedian band divided lengthwise by brown - *Pampasatyryus imbrialis*
  - b. Ventral hindwing with obvious ocelli and with the postmedian band not divided - 37
- 37.
  - a. Ventral hindwing with a ripple pattern over the entire wing and only two small, yellow ocelli between Rs and M2 - *Pampasatyryus yacantoensis*
  - b. Ventral hindwing without a ripple pattern and with more than two ocelli - 38
- 38.
  - a. Ventral hindwing ocelli small, yellow, and lenticular - *Pampasatyryus nilesi*
  - b. Ventral hindwing ocelli large, black, round, and may be pupillated - 39

- 39.
- a. Ventral ocelli very large with two to three white pupils, hindwing ventral hindwing postmedian band strongly white at the edges and brown in the center - *Pampasatyrus peripheras*
  - b. Ventral ocelli not as large with one or two white pupils, ventral hindwing postmedian band white throughout and scalloped at the distal edge - *Pampasatyrus ocelloides*
- 40.
- a. Wings narrower and more elongated, ripple pattern over the ventral side of both wings, ventral forewing apical ocellus usually unipupillate, ventral forewing without a rust patch over the discal cell - *Cosmosatyrus dubii*
  - b. Wings wider and without ripple pattern over the ventral side of both wings, ventral forewing apical ocellus usually bipupillate or consisting of two fused ocelli, ventral forewing with a distinct rust patch over the discal cell - *Cosmosatyrus stelligera*

### Redescriptions: The Neomaeniti

*Argyrophorus* Blanchard, 1852

Type species: *A. argenteus* Blanchard, 1852

Pyrzcz and Wojtusiak (2010) redefined *Argyrophorus* using head morphology, wing patterning, venation, wing shape, and male genitalic characters to be inclusive of *Etcheverrius*, *Palmaris*, and *Punargentus*. The latter three genera, have here been combined into *Punargentus*. All these genera are closely related according to both molecular and morphological analysis, but *Argyrophorus* is sufficiently distinct to warrant separation. Pyrcz and Wojtusiak place *blanchardi* in *Argyrophorus* using their broader definition and the similarities in the VFW M1-M3 ocellus as well as the general shape of the valvae and the uncus, tegumen, and gnathos agree with the narrower definition set forth in this study. Blanchard's *Argyrophorus*, then, is distinguished from *Punargentus* most notably by a singly pupillated M1-M3 VFW ocellus, valvae that are are rounder and wider at the distal end than in *Punargentus*, and the saccus narrower.

*Argyrophorus argenteus argenteus* Blanchard, 1852

Type locality: Chile

Holotype: (male) MNHN, Paris (Photo examined)

*Argyrophorus argenteus barrosi* Peña, 1968

Type locality: South of Tongoy, Coquimbo province, Chile

Holotype: (male) MNHN, Santiago de Chile (not examined)

*Argyrophorus argenteus elinoides* Ureta, 1956

Type locality: Angol, Araucanía province, Chile 120m above sea level, 17 Jan. 1952

Holotype: (male) MNHN, Santiago de Chile (Photo examined)

Discussion: Probably the most studied of the south temperate pronophilines, no doubt due to the compelling silver coloration on the dorsal side of both forewings and hindwings, especially in male specimens, which are unique among butterflies in their metallic silver sheen. The structural nature of this coloration has been used as a model for constructing ultra-thin synthetic broadband reflectors for use in optical devices such as lasers and solar cells (Vukusic et al., 2009). Elwes (1903) referred to it as “one of the most beautiful and unique butterflies in Chile, or I may say in the world.” and Weymer (1911) described it as “one of the most striking insects in the American fauna.” Elwes noted that it is found on grassy hillsides and both authors state that is a slower flier in the morning, but difficult to catch in the afternoon. Two subspecies other than the nominate subspecies have been described, *A. argenteus barrosi* according to Peña (1968), can be found feeding on yellow flowers in coastal

grassy areas of Coquimbo province, Chile, below 50m altitude. O. Barros, for whom the subspecies is named, described in Peña (1968) the oviposition as slow, linear, and taking place on the ventral side of the leaves of the coirón grasses (*Stipa sp.?*). Peña went on to describe the eggs as round, blunt, and pale yellow that turns silver during development. *A. argenteus elinoides* was described as considerably larger and found in the more southern parts of the range of *A. argenteus argenteus*, the females with more black markings on the dorsal side.

Diagnosis: Easily distinguished from other species by the silver coloration on the dorsal side of both wings. Dorsal side of both wings of the females are bordered in taupe to chocolate along the costa and the subterminal band, which is dentate at the proximal edge. Ocellus between M1-M2 on the dorsal side of the forewing is clearly visible in the females and occasionally appears as a tiny black dot in the males. Males have sparse androconia on the forewing that are obscured by the refractive nature of the silver scales, but can be viewed when backlit and a drop of 90% ETOH is applied to the junction of the veins to the discal cell. Females are more subdued in color than the males on the ventral side and bear a clearly visible postmedian band on the forewing. Male genitalia are easily distinguished by wide valvae with serrate edges visible when viewed from the ventral side and an aedeagus with wing-like flanges on either side of the median.

Head: Antennae 8-12mm, covered in white scales and terminating in a round club. Eyes oval and naked, length approximately 1.3 times width. In the males, palp scales are white dorsally with a longitudinal black stripe along the median and white with chocolate piliform scales ventrally. Female palps white with a longitudinal bronze stripe along the median, honey piliform scales dorsally, and chocolate piliform scales ventrally. Terminal palp segment is oval and about three-tenths the length of the second segment.

Thorax amber with iridescent black to bronze scales in the males and white and bronze in the females, both sexes with white and bronze piliform scales. Foreleg tarsi are clublike and unsegmented in both sexes. Midlegs and hindlegs with four rows of dark amber to black spines on the tibia and tarsus. In the males, abdomen is white to cream ventrally, the dorsal side dark chocolate and bronze interspersed with white scales. Females are white ventrally and white to cream and bronze dorsally.

Forewing: Wingspan 30-34mm, females larger than the males. Termen nearly straight to slightly convex and the distal end of the discal cell sinuate with the cubital end straighter than the radial end. Males with sparse androconia in sparse patches between R5 and CuA2. Males silver with dark chocolate and silver fringe scales and, occasionally, a small black dot between M1-M2. Females silver, taupe at the costa and with a subterminal band in coffee with a dentate proximal border. Fringe scales are mainly silver with sparse dark chocolate scales. Females bear a small, round or oval black ocellus between M1-

M2. Ventral side silver in the males and coffee at the inner margin with a patch of rust orange over the discal cell. A thin dentate line of coffee scales can sometimes be seen along the terminal edge. Ocellus between M1-M2 is round, black, and unipupillate. Females are taupe on the ventral side with an orange patch over the discal cell. Postmedian band is platinum and edged in dark chocolate brown. Median border is nearly straight from the costa to M3, narrowing between M3 and CuA1 and sigmoidal in shape, widening again between CuA1-CuA2, and terminating in an acute triangle between CuA2-1A+2A. Subterminal border is dentate. Ocellus between M1-M2 is round, black, and unipupillate with a platinum ring that is circumscribed in taupe.

Hindwing: Wing oval, termen convex and barely scalloped. Dorsal side silver in the males with chocolate along the costa. Females are silver, taupe along the costa, with a subterminal border in taupe to chocolate. Proximal border of the subterminal band is scalloped. Ventral side of the males silver, bronze, and black from the base to a sinuous submedian black line. Postmedian band is silver and bordered thinly with black, irregularly sinuous at the median edge and scalloped at the subterminal edge. Ocelli are black and bordered in bronze. Ocellus between Rs-M1 is linear and 2-3mm in length. Ocellus between M1-M2 is also linear and about 10mm in length, stretching to within a few millimeters of the discal cell and the termen. Ocelli between M2 and 1A+2A are lenticular. A silver line parallel to the veins bisects the cell between CuA2-1A+2A and a narrow silver V can be seen in the discal cell, the point of the V closest to the

base. Veins are highlighted in silver. Females are similar, but more subdued in color, bronze appearing as taupe and silver appearing as platinum.

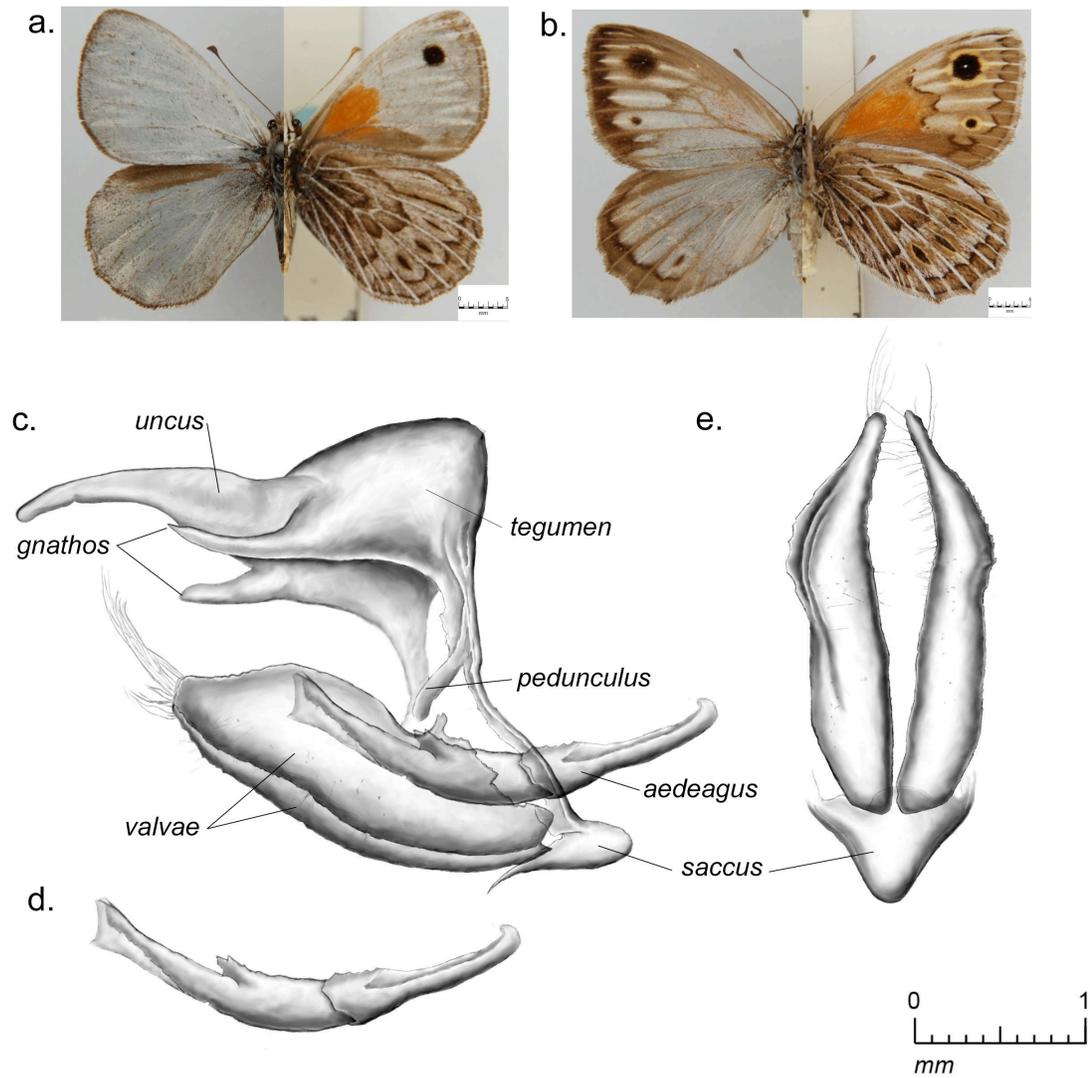
Male genitalia: Uncus widest at the base, narrowing gradually to a blunt finger-like terminus, and approximately 1.4 times as long as the tegumen.

Gnathos acute and less than half the length of the uncus. Pedunculus long and U-shaped. Saccus U-shaped, nearly deltoid, and less than two-thirds the length of the gnathos. Valvae wide with a deltoid distal end and, when viewed from the ventral side, a serrate edge can be seen on the distal half. Aedeagus is nearly even in width from the distal end to the median where serrate wing-like flanges appear on either side, doubling the width. From this point, aedeagus narrows to an acute proximal terminus.

Distribution: Can be found amongst bunch grasses in Chile from southeastern Atacama province to southeastern ARAUCANÍA province and in Argentina from northwestern Neuquén province to western Mendoza province from January to early March at 100-2400m above sea level.

Specimens examined: Chile, Bío Bío province, (OSU) 000095088, 000095089, 000095094, and 000095107, (MTSU) CH24-7, CH24B-01, and CH24B-02; Argentina, Neuquén province, (MTSU) JMC0807 and JMC0808

*Argyrophorus argenteus* Blanchard, 1852



**Figure 1-1. (a) Male dorsal (left) and ventral (right) BMNH#789887, (b) female dorsal (left) and ventral (right) BMNH#789927, (c) male genitalia OSU#95107 in lateral view from the right side, (d) aedeagus in lateral view from the right side, (e) saccus and valvae in ventral view.**

*Auca* Hayward, 1953

Type species: *Auca pales* (Philippi, 1859) (*Satyrus*), synonym of *Auca coctei* (Guérin-Ménéville, [1838]) (*Satyrus*)

Similar to *Neomaenas*, *Auca* has a well-developed M1-M3 ocellus on the ventral side of the forewing and a trapezoidal hindwing, barely scalloped to scalloped and excavated between the anal vein and 1A+2A. Male *Auca* also bear heavy androconia on the forewing that are clearly visible with the naked eye. Hayward's description relies heavily on wing venation, but there are no notable differences in venation from most other *Neomaeniti*. Antennae terminate in a spatulate club, eyes are oval and naked, and foreleg tarsi are clublike and unsegmented, though Hayward describes some pseudosegmentation in the foreleg tarsi. Palps are not longitudinally striped as most *Neomaenas* are and the terminal segment is cylindrical and about a third the length of the second segment. Male genitalia of both *A. coctei* and *A. barrosi* are similar to that of *N. monachus*, but overall more slender in the uncus, valvae, and tegumen. *Auca coctei* is common throughout Chile from Coquimbo to Los Rios province and populations can be found on dry hillsides with scrubby bushes, in urban and suburban settings, in low, wet places, in meadows, and in open places near woods.

*Auca coctei* (Guérin-Ménéville, [1838]) (*Satyrus*)

Type locality: Chile

Holotype: (male) MNHN, Paris (Photo examined)

= *Satyrus tragiscus* Reed, 1877, nom. nud.

= *Epinephele coctei* var. *confusa* Köhler, 1935

Type locality: Nahuel Huapí, Neuquén province, Argentina

Lectotype: (male) MACN (Photo examined)

= *Epinephele nycteropus* Reed, 1877

= *Epinephele nycteropus andensis* Köhler, 1939

Type locality: Lago Traful, Neuquén province, Argentina

Lectotype: (male) MACN (photo examined)

= *Satyrus pales* Philippi, 1859

Type locality: Valdivia province, Chile (from text)

Type: no type

Discussion: This is one of the most abundant species of the South Temperate clade and highly variable in wing patterning, particularly on the ventral side of the hindwing. Examination of specimens from a wide variety of localities reveals that the strength and color of the ventral side hindwing postmedian band and the ventral side hindwing ocelli, characters previously used to differentiate species, are expressed along a gradient. Two names, *A. nycteropus* and *A. pales*, have been synonymized here. In Reed, 1877, the name *Epinephele*

*nycteropus* is applied to an illustration that is “corrected” in the errata to refer to a redescription of *Homoeonympha boisduvalii* under the name *Hipparchia boisduvalii*, but the illustration is clearly that of an *A. coctei* with a very strong postmedian band. *A. nycteropus*, under the name *Neosatyrus nycteropus*, is described in Elwes (1903) with an illustration that matches that in Reed. Though no type material exists, specimens that fit these illustrations exactly and have been identified as *A. nycteropus* are indistinguishable from *A. coctei* in both morphological and genetic characters. *A. pales* was described by Phillippi on the basis of the absence of two of the hindwing ocelli and a darker, more uniform color in the hindwing, but these characters are highly variable and insufficient to differentiate *A. pales* as a separate species. *Auca tragiscus*, *A. coctei* var. *confusa*, and *A. nycteropus andensis* were previously synonymized by Lamas and Vilorio (2004) and photographs of the types seem to indicate that they are, indeed, synonyms of *A. coctei*. Specimens can be collected in dry mountainous environments with sparse, scrubby vegetation, in grassy meadows, in low, wet areas, and even in urban or suburban settings. Eggs are generally barrel-shaped with vertical ridges around the circumference and a round operculum.

Diagnosis: Most similar to *Auca barrosi*, but having bolder design elements on the ventral side of the hindwing, including a more visible postmedian band with an irregularly scalloped median border rather than smoothly sinuous as in *A. barrosi*. This species is common across central Chile and varies widely in the presence or absence of wing pattern elements. On the ventral side of the

hindwing, ocelli between Rs-M1 and M1-M2 may be black, white, yellow, or indiscernible and yellow spots between M3-CuA1 and CuA1-CuA2 may appear in white or not visible at all. On the forewing, apical ocellus between M1-M3 is visible on the dorsal side in females and is black, round, and bipupillate on the ventral side in both sexes. Males have heavy androconia on the forewing in U-shaped patches between M1 and the inner margin that are visible to the naked eye. Foreleg tarsi are clublike and unsegmented in both sexes. Male genitalia are overall slender in appearance, the valvae and tegumen especially narrow relative to length.

Head: Antennae 7-8 mm, covered in white scales with a longitudinal stripe of dark chocolate scales that cover half of a spatulate club. Eyes oval and naked, length approximately 1.3 times width. In the males, palp scales are white at the basal half of the dorsal side, the distal half chocolate brown and white, black, and chocolate brown on the ventral side. Female palp scales are also white at the base on the dorsal side with the distal half taupe and taupe, white, chocolate, and black on the ventral side. Terminal palp segment is cylindrical and approximately three-tenths the length of the second segment.

Thorax is dark amber with taupe and coppery brown scales, with taupe and white piliform scales in the males and iridescent black and white with white piliform scales in the females. Foreleg tarsi are clublike and unsegmented in both sexes. Midlegs and hindlegs with four rows of black spines on the tibia and

tarsus. Abdomen is taupe to white in the females and chocolate to dark chocolate in the males.

Forewing: Wingspan 20-26mm. Termen nearly straight to slightly concave and the distal end of the discal cell widely V-shaped. Males with heavy androconia in U-shaped patches in each cell between M1 and the inner margin. Dorsal side of the males chocolate to dark chocolate brown with the androconia clearly visible to the naked eye, the fringe scales taupe to chocolate and white. Females taupe to chocolate brown on the dorsal side with a broad patch of rust red to rust orange that extends from the base to the median just beyond the borders of the discal cell. Postmedian band is a lighter orange with the apical ocellus between M1-M3 appearing as an indistinct black spot. Ventral side taupe to dark chocolate, the females lighter than the males. A patch of rust orange to rust red extends from the discal cell to the subterminal side of the postmedian band. Subterminal border of the postmedian band deckle-edged and the median border nearly straight, but with a V-shaped curve toward the termen between M3 and CuA1. Rust color is lighter in the postmedian band than in the discal cell. Ripple pattern is visible along the costal border and the apex may be highlighted with white over the radials. Apical ocellus between M1-M3 is round, black, ringed in daffodil yellow, and usually bipupillate.

Hindwing: Wing trapezoidal, termen convex and scalloped. Dorsal side similar in color to the forewing, both sexes with a postmedian band often appearing in rust orange to rust red patches between Rs and CuA2. Long piliform

scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side with a ripple pattern visible over all design elements in chocolate to dark coffee striations. A band often appears highlighted in white and daffodil yellow extending from the base to a scalloped dark coffee submedian border. Postmedian band is similar in color as this subbasal band, the subterminal border deckle-edged and the median border irregularly scalloped. A darker V-shaped patch splits the postmedian band from the costa to M1. A small yellow or white spot often appears in the postmedian band between M3-CuA1 and CuA1-CuA2. An oval to round black spot, sometimes ringed in daffodil yellow and rarely unipupillate, or sometimes reduced to a small white or yellow spot may appear between Rs-M1 and M1-M2.

Male genitalia: Uncus widest at the base, narrowing gradually to a blunt end and measuring approximately 1.3 times the length of the tegumen. Gnathos acute and a little less than half the length of the uncus. Pedunculus U-shaped. Saccus deltoid and about two-thirds the length of the gnathos. Valvae widest at the median, narrowing gradually toward the distal end, widening slightly then narrowing again on the dorsal side just before terminating in a blunt end. Aedeagus nearly even in width throughout, slightly narrower at the median, and terminating in a U-shaped proximal end.

Distribution: Can be found in Chile from northern Coquimbo province to northern Los Lagos province and in the western part of Neuquén province,

Argentina from from late October to mid March at nearly sea level to 2300m above sea level.

Specimens examined: Chile, Coquimbo province, (MGCL) 3 males, 2 females; Chile, Valparaiso province, (BMNH) 809656, (OSU) 000093358, (MTSU) CH31-1-CH31-3, CL1019-CL1022, CL1025-CL1029, CL1031; Chile, Santiago Metropolitan province, (OSU) 000093355, 000093356, 000093359, 000093360 (MTSU) CH29-1, CH29-5-CH29-8, CH43-2, CH44-1, CL0101-CL0114; Chile, O'Higgins province, (MTSU) CH1-1, CH1-2; Chile, Maule Province, (OSU) 000093361, 000095047, (MTSU) CH26-6-CH26-8; Chile, Bío-Bío province, (OSU) 000095045, 000095949, 000095052, (MTSU) CH14-1, CH15-4, CH17-1, CH17-2, CL0302-CL0306, CL0314, CL0316, CL0417, CL0418, CL0425-0432, CL0502-CL0517, CL0902-CL0906; Chile, Araucanía province, (BMNH) 809656, 809657, (MTSU) CL0817-0822; Chile, Los Ríos province, (MTSU) CH12-2; Chile, unknown location, (CU) 3 males; Argentina, Neuquén province, (MTSU) JMC0802-JMC0804

*Auca barrosi* (Silva 1917) (*Epinephele*)

Type locality: Curicó, Maule province, Chile

Lectotype: (male) MNHN, Santiago de Chile (Photo examined)

= *Auca delessei* Herrera, 1974

Type locality: Nilahue, toward Curicó, Maule province, Chile

Type: no type

Discussion: *Auca delessei* was previously synonymized by Lamas and Viloria (2004). Most notably, Herrera describes a superior projection toward the distal end of the valvae that agrees with that of *A. barrosi* and differentiates it from paler representatives of *A. coctei*.

Diagnosis: Most similar to *Auca coctei*, but more subdued in color and pattern, the dorsal side plain brown, and the postmedian band on the ventral side of the hindwing with the median edge smoothly sinuous instead of irregularly scalloped and bearing a small white spot between M3-CuA1 and CuA1-CuA2. Males have heavy androconia in rectangular patches from R5 to the inner margin. Foreleg tarsi are clublike and unsegmented. Male genitalia are slender in appearance as in *coctei*, but differ in the attenuated distal end and the pronounced rounded protuberance on the dorsal side of the distal one-third of the valvae.

Head: Antennae 7-8 mm with white scales and a longitudinal stripe of chocolate scales that cover half of a spatulate club. Eyes oval and naked, length approximately 1.3 times width. Palps taupe and white with the terminal palp segment cylindrical and a little less than one-third the length of the second segment.

Thorax dark amber with iridescent black scales and covered in taupe and white piliform scales. Abdomen cream ventrally and chocolate brown dorsally. Foreleg tarsi with one clublike segment in the males. Females were unavailable

for study. Midlegs and hindlegs with four rows of dark amber to black spines on the tibia and tarsus.

Forewing: Wingspan 20-26mm. Termen straight to slightly concave and the distal end of the discal cell widely V-shaped. Males with heavy androconia in rectangular patches in each cell between R5 and the inner margin. Dorsal side chocolate brown with the fringe scales in the same color. Ventral side taupe with a rust orange patch extending from discal cell to the median side of the postmedian band, which is edged on either side with a thin line of chocolate brown. Apical ocellus between M1-M3 is round, black, ringed in daffodil yellow, and bipupillate.

Hindwing: Wing trapezoidal, termen convex and barely scalloped. Dorsal side similar in color to the forewing with long piliform scales appearing at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side taupe with chocolate brown striations in a ripple pattern over the entire wing. Postmedian band is slightly lighter than the rest of the wing with the median edge chocolate and sinuous and the subterminal edge, when visible, is chocolate and irregularly scalloped. A small white spot may appear in the postmedian band between M3-CuA1 and CuA1-CuA2.

Male genitalia: Uncus widest at the base, narrowing gradually to a blunt end, and measuring about the same length or a little longer than the tegumen. Gnathos acute and a little less than half the length of the uncus. Pedunculus U-shaped. Saccus widely U-shaped and more than two-thirds the length of the

gnathos. Valvae widest at the proximal one-third, narrowing gradually toward an attenuated distal end that bears a rounded protuberance on the dorsal side of the distal one-third. Aedeagus nearly even in width throughout, narrower proximally, and terminating in a narrow U-shaped proximal end.

Distribution: Can be found in Chile from northern Coquimbo province to northern Araucania province from mid October to mid March at nearly sea level to 2500m above sea level.

Specimens examined: Chile, Santiago Metropolitan province, (OSU) 000095050, (MTSU) CH29A-4, CH29C-2, CH43-3; Chile, Maule province, (MTSU) CH26-2, CH26-4, CH26-5

*Auca coctei* (Guérin-Méneville, [1838])(*Satyrus*)

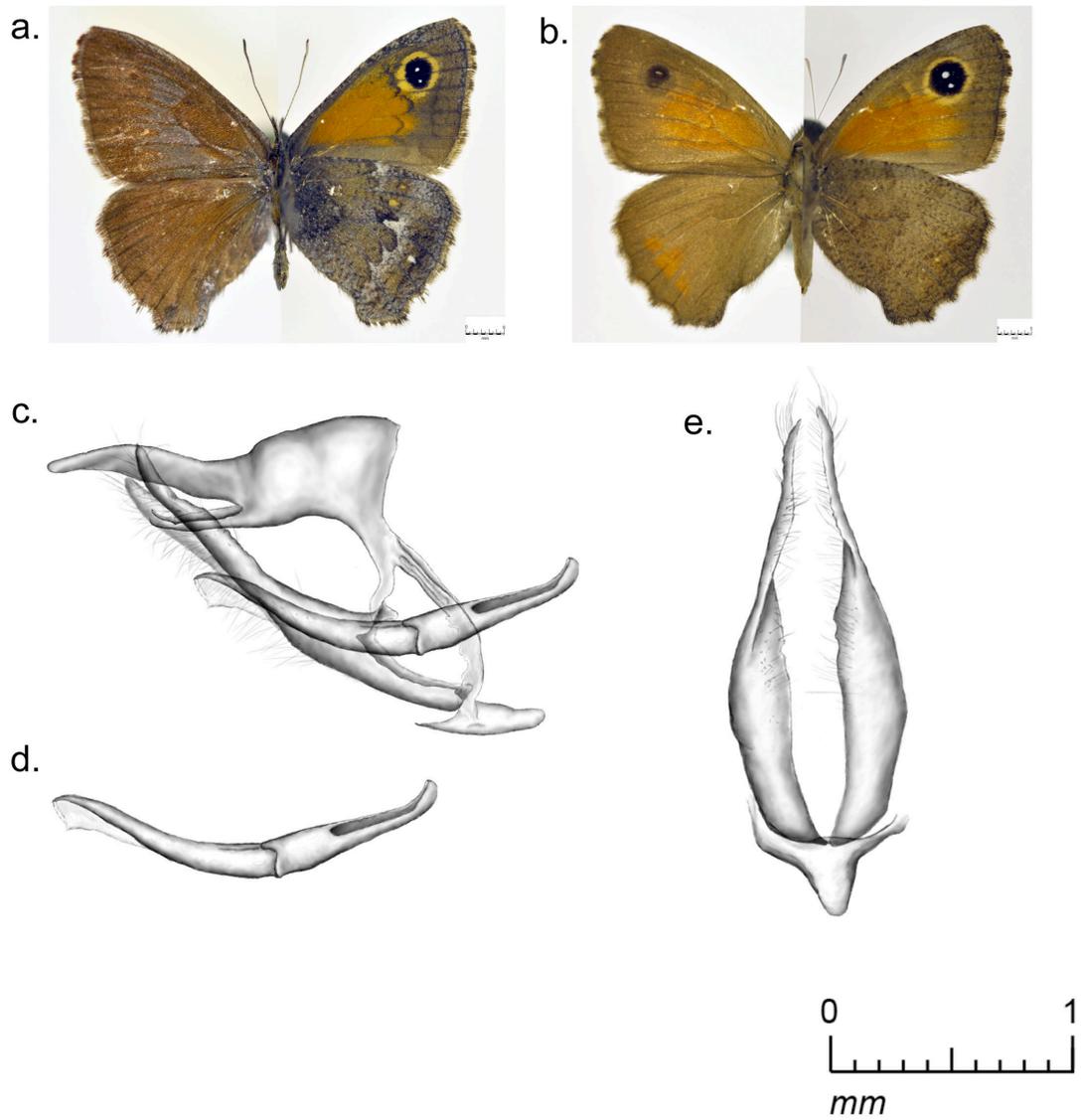


Figure 2-1. (a) Male dorsal (left) and ventral (right) OSU#93358, (b) female dorsal (left) and ventral (right) OSU#95049, (c-e) male genitalia CH29-8

*Auca barrosi* (Silva, 1917) (*Epinephele*)

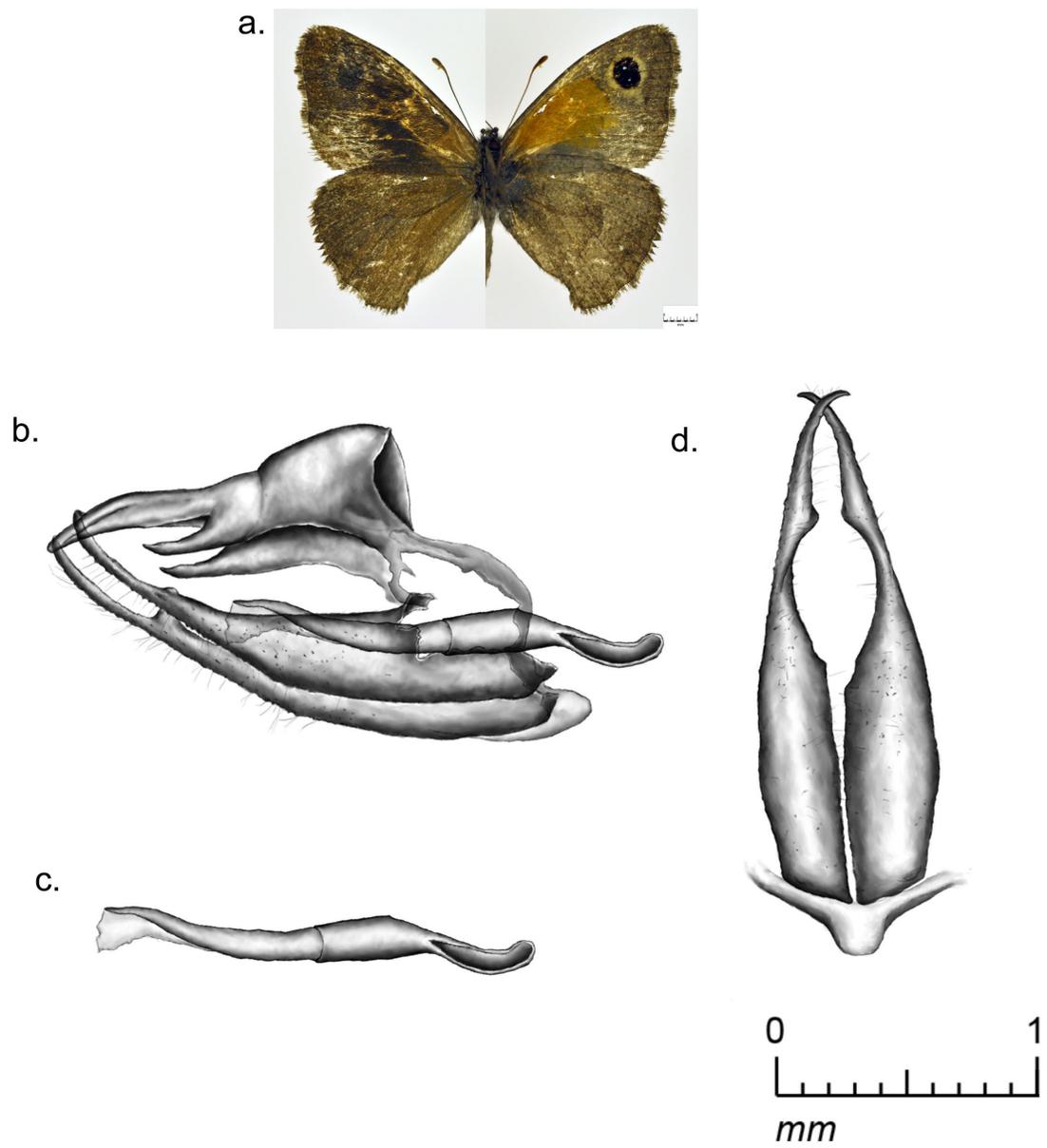


Figure 2-2. (a) Male dorsal (left) and ventral (right) OSU#95050 and (b-d) male genitalia CH29C-2

*Cosmosatyrus* C. Felder & R. Felder, 1867

Type species: *Cosmosatyrus leptoneuroides* C. Felder & R. Felder, 1867

*Cosmosatyrus* was originally described as and is considered monotypic in Lamas (2004), but our phylogenetic analysis places *stelligera* (Butler 1881) in close relationship with *leptoneuroides*. Herrera (1966) formed the genus *Chillanella*, another monotypic genus containing only *stelligera*, on the basis of the positions of the forewing radial veins, which he noted is similar to that of *Neosatyrus* but with sufficient difference in genitalic characters to separate it as a new genus. However, the position of the forewing radial veins is inconsistent in the Neomaeniti, even between individuals of the same species collected from the same locality and is therefore unreliable as a character upon which to base the formation of a separate genus. Additionally, the male genitalia of *C. stelligera* differs from *Neosatyrus* and is more closely aligned with *Cosmosatyrus* in the longer and more slender uncus with the aedeagus more even in width at the distal end. *Cosmosatyrus* bears an M1-M3 ocellus on the ventral side of the forewing that may appear as a single bipupillate ocellus or two unipupillate ocelli fused at M2. The distal end of the discal cell is deeply sinuous. *C. leptoneuroides* males bear androconia on the forewing, but *stelligera* and *dubii* do not. The hindwing is oval and may be slightly crenate to entire with an ocellus appearing in each cell between Rs and CuA2. Antennae terminate in a spatulate club in *leptoneuroides* and *stelligera*, with that of *dubii* round. Terminal palp segment is cylindrical in *leptoneuroides* and *stelligera* and conical in *dubii*. Eyes are naked

and tarsal segmentation in the foreleg is variable, with *leptoneuroides* unsegmented in both sexes, *stelligera* with three segments in both males and females, and *dubii* males with three segments and females with four segments.

*Cosmosatyrus leptoneuroides leptoneuroides* C. Felder & R. Felder, 1867

Type location: Chile

Lectotype: (male) BMNH #809617 (Specimen examined)

Paralectotype: (male) BMNH #809616 (Specimen examined)

= *Satyrus morania* Berg, 1877a

Type location: Santa Cruz province, Argentina

Lectotype: (male) MACN, Buenos Aires (Photo examined)

= *Erebia plumbeola* var. *duseni* Staudinger, 1899

Type location: P. Dusén, Rio Aysén, Aysén Province, Chile

Holotype: (female) MFN, Berlin (Photo examined)

= *Cosmosatyrus statia* Weymer, 1911

Type location: Chile

Type: no type

*Cosmosatyrus leptoneuroides plumbeola* (Butler, 1868) (*Tetraphlebia*?)

Type location: Puerto Hambre, Magallanes province, Chile

Holotype: (male) BMNH #809624 (Specimen examined)

= *Satyrus antarctia* Reed, 1877, nom. nud.

Type: no type

Discussion: Specimen (male) BMNH #809617 is newly designated as the lectotype, none having previously been designated from the syntypes. The paralectotype is identical but for a minor difference in the strength of the yellow median border of the postmedian band. With a few notable exceptions, the wing patterning of *C. leptoneuriodes* is fairly uniform across its geographical range, which extends from Coquimbo province 300km north of Santiago, Chile, to the Straits of Magellan in the far south. *Cosmosatyrus statia*, from the illustration in Weymer (1911) appears in every respect to agree with the *C. leptoneuriodes leptoneuriodes* type, but without the Rs-M1, M2-M3, and M3-CuA1 ocelli.

*Cosmosatyrus leptoneuriodes plumbeola* represents the southernmost examples of the species and is smaller and darker than those from the northern parts of the range. There is no evidence of a contiguous range, leaving this subspecies apparently isolated from the nominal subspecies. *Cosmosatyrus leptoneuriodes plumbeola* tends to be smaller, darker, and with a more reduced M1-M3 ocellus on the ventral side of the forewing. Curiously, a few specimens have been found near Cerro Castillo (51°14'28"S, 71°23'52"W) and Puerto Prat (51°38'S, 72°38'W) that completely lack the M1-M3 ventral side forewing ocellus. These aberrant forms appear to be unique to these localities and are not found elsewhere.

Diagnosis: Easily distinguished from other species by distinct patterning on the ventral side of the hindwing. Postmedian band with the proximal edge

daffodil yellow that fades to chocolate brown and bearing an ocellus in each cell between Rs and CuA2. Ocelli between Rs-M1, M1-M2, and CuA1-CuA2 are round, black, unipupillate, and ringed in daffodil yellow, the Rs-M1 ocellus being the smaller of these. Ocelli between M2-M3 and M3-CuA1 are round, white, and may be ringed in daffodil yellow. Hindwing veins are highlighted in white, more strongly so at the proximal edge of the postmedian band. Ventral side of the forewing bears a patch covering the discal cell to the proximal edge of the postmedian band that may be orange, rust orange, rust red, or peach, depending on the region from which the specimen was collected. Apical ocellus on the ventral side of the hindwing varies from a small, unipupillate black spot ringed in daffodil yellow that is confined within M1-M2 to a large bipupillate black ocellus ringed in daffodil yellow that spans across M1-M3. Specimens from Magallanes province, Chile, may be entirely without this ocellus. Foreleg tarsi unsegmented in both sexes, but female tarsi may be constricted near the distal end, having the appearance of segmentation without being articulated.

Head: Antennae 7-10mm with white to cream scales and a longitudinal stripe of chocolate brown scales that covers half of a spatulate club. Eyes round and naked, length approximately 1.2 times width. Palps with a longitudinal white to cream stripe along the median with the dorsal side piliform scales chocolate brown and the ventral side with black, tan, and chocolate piliform scales and white to cream piliform scales included toward the base. Males with the terminal segment entirely chocolate to dark chocolate brown and females with white

scales that continue the longitudinal white stripe from the second segment.

Terminal palp segment cylindrical and a little more than one-third the length of the second segment.

Thorax sepia with iridescent black scales and covered in chocolate and cream piliform scales. Females similar, but with cream to white scales in addition to the iridescent black. Abdomen cream ventrally and chocolate to dark chocolate brown dorsally. Foreleg tarsi unsegmented and clublike in the males, the female tarsi a little longer and sometimes having the appearance of segmentation approximately where the first tarsal segment would be. This pseudo-segmentation appears as a slight constriction or line that circumscribes the tarsus.

Forewing: Wingspan 28-35mm. Termen nearly straight or slightly convex and the distal end of the discal cell sinuous, the costal half more deeply curved than the cubital half. Males with androconial scales that extend in triangular patches from M1 to 1A+2A and into the discal cell near M2. Dorsal side chocolate to dark chocolate brown with fringe scales of the same color. Females slightly lighter than the males with fringe scales lighter than wing color. Ventral side with a patch that extends from the discal cell to the post median band in rust red, orange, rust orange, or peach. Color of this patch may be a regional variance. Costa, inner margin, and postmedian band to the termen are chocolate to dark chocolate brown, the termen sometimes edged in white and the postmedian band outlined in dark coffee. Apical ocellus may appear as a

unipupillate round black spot ringed in daffodil yellow between M1-M2, as a bipupillate black spot ringed in daffodil yellow that extends from M1-M3, or as two separate ocelli that may begin to fuse at M2. Specimens from Magallanes province in Chile may be entirely without this ocellus. A whitish patch is sometimes visible where the radial veins meet the costa.

Hindwing: Wing oval, termen slightly convex and barely scalloped with the inner margin excavated between the anal vein and 1A+2A. Dorsal side similar in color to the forewing, sometimes with patches of rust red along the most distal edge of the postmedian band. Long piliform scales appearing on both sexes at the base and over the discal cell, extending to the median. Ventral side chocolate brown with a ripple pattern of dark chocolate to dark coffee striations that extends from the base to the postmedian band and a sinuous submedian line in dark chocolate to dark coffee. Both edges of the postmedian band scalloped, the proximal edge more so than the distal edge, and outlined in dark chocolate to dark coffee. Postmedian band chocolate brown with the proximal edge daffodil to maize yellow. A sometimes unipupillate black ocellus ringed in yellow appears between Rs-M1, M1-M2, and CuA1-CuA2, the first of these slightly smaller than the other two. A round white ocellus sometimes ringed in yellow appears between M2-M3 and M3-CuA1. Veins are highlighted in white.

Male genitalia: Uncus widest at the base, narrowing gradually to a blunt finger-like terminus, and approximately twice as long as the tegumen. Gnathos acute and a little more than half the length of the uncus. Pedunculus long and U-

shaped. Saccus U-shaped and one-third the length of the gnathos. Valvae narrow at the proximal end, more than doubling in width at the proximal one-third and gradually narrowing toward the distal end. Distal one-third widens dorsally then attenuates abruptly at the distal one-fourth to a finger-like terminus. Aedeagus nearly even in width throughout, slightly wider at the median, and with an acute proximal end.

Distribution: Can be found in Chile from the coast of central Coquimbo province south to the Strait of Magellan and in Argentina in northern Neuquén province and on the islands of the Paraná Delta north of Buenos Aires from November to March at nearly sea level to 3800m above sea level.

Specimens examined: *C. leptoneuroides leptoneuroides* Chile, Bío-Bío province, (MTSU) CH15-5-CH15-7, CH16-2, CH24A-4, CL0201, CL0313, CL0315, CL0424, (UJ) 3 males, 4 females; Chile, unknown location, (BMNH) Paralectotype: 809616, Lectotype: 809617, (CU) CU010; *C. leptoneuroides plumbeola* Chile, Magallanes province, (BMNH) Holotype 809624, (UJ) 5 males, 2 females.

*Cosmosatyrus dubii* (Pyrz 2012) (*Faunula*) n. comb.

Type locality: 6 km south of Gallegos Chico, Magallanes, Chile,

52°04'71"S"/70°44'49"W, 184 m

Holotype: (male) UJ collection (Photo examined)

Allotype: (female) UJ collection (Photo examined)

Discussion: This species is named for lepidopterist, Dubi Benjamin. No fresh specimens were available for study and no DNA was extracted, but morphological analysis places *C. dubii* in close relationship with *C. stelligera*. Pyrcz places this species in *Faunula*, here combined with *Tetraphlebia*, "as determined by its elongate wings with gently rounded FW apex and distal margins, single FWV subapical ocellus and male genitalia characterized by a short and massive uncus, stout gnathos, and elongate, roughly rectangular valva with a smooth dorsum and rounded distal extremity." However, wing characteristics and genitalic characters more closely resemble *Cosmosatyrus*, particularly *C. stelligera*. The most obvious similarity between *C. dubii* and other members of *Cosmosatyrus* is the presence of ocelli along the VHW postmedian band. Hindwings of *C. dubii* and *C. stelligera* are similarly oval where those of *Tetraphlebia*, including *T. leucoglène* are squared at the hindwing tornus. The pupillation of the VFW apical M1-M3 ocellus is variable in both *Tetraphlebia* and *Cosmosatyrus* as well as in several other genera of the Neomaeniti, including *Auca*, *Neomaenas*, and *Nelia*. The inner margin of the VHW postmedian band is deeply scalloped or dentate, very similar to that of *C. stelligera*, where the inner margin of *T. leucoglène* is shallowly and irregularly scalloped. Palps are more uniform in color in *Tetraphlebia*, but those of *C. dubii* are multicolored as in *Cosmosatyrus*. Furthermore, male genitalia of *C. dubii*, more closely resemble those of *Cosmosatyrus* than those of *Tetraphlebia* and are very similar to *C.*

*stelligera*. Pyrcz describes the valvae as "roughly rectangular," but the distal end of the valva is slender and elongated in *C. dubii* as in the other *Cosmosatyrus*, where the distal end of the valvae in *Tetraphlebia* terminate in a wide U-shape. The short, nearly deltoid saccus is more similar to *C. stelligera* than the long, U-shaped saccus of the *Tetraphlebia*. Lastly, the uncus is significantly longer than the tegumen in *C. dubii*, as it is in *Cosmosatyrus*, but in *Tetraphlebia*, the uncus is close to the same length as the tegumen.

Diagnosis: Similar to *C. stelligera*, but with a distinctive ripple pattern on the ventral side of both wings and the forewing not having a postmedian band or a rust red to rust orange patch over the discal cell on the ventral side. Terminal palpal segment conical and much shorter in proportion to the second palpal segment than in *C. stelligera* and females of *C. dubii* with four tarsal segments in the forelegs.

Head: Antennae 7-9mm with chocolate scales and a longitudinal stripe of white scales, terminating in a round club. Eyes oval and naked, length about 1.3 times width. Palps white with white, chocolate, and black piliform scales. Terminal palp segment conical and about one tenth the length of the second segment.

Thorax with iridescent black scales and chocolate piliform scales in the males. Females with white and iridescent black scales and chocolate and cream piliform scales. Forelegs with three tarsal segments in the males and four in the

females. Midlegs and hindlegs with four rows of dark amber spines on the tibia and tarsus.

Forewing: Wingspan 26-28mm. Termen nearly straight to slightly convex and the distal end of the discal cell deeply sinuous, the distance between M1-M2 greater than between M2-M3. Males are without visible androconia. Dorsal side chocolate to dark chocolate brown with fringe scales the same color. Ventral side the same color as the dorsal side with a dark chocolate to dark coffee ripple pattern over most of the wing. Apical ocellus between M1-M2 round, black, unipupillate, ringed in tan and sometimes fused with a smaller, similar ocellus between M2-M3.

Hindwing: Wing oval, termen convex and entire. Dorsal side and fringe scales similar in color to the forewing and long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side slightly darker than the dorsal side from the base to the median and similar in color to the dorsal side from the median to the termen. A ripple pattern appears over the entire ventral side of the wing in coffee to dark coffee striations. A coffee to dark coffee scalloped line appears through the center of the discal cell. Median edge of the postmedian band is irregularly scalloped or deckle-edged and coffee to dark coffee. A small, round, white ocellus weakly ringed in black appears in each cell between Rs and 1A+2A.

Male Genitalia: Uncus widest where it joins the tegumen, narrowing gradually toward the distal end. Distal end of the uncus was damaged in the

specimen examined. Gnathos acute and a little less than half the length of the tegumen. Pedunculus short, wide, and deltoid. Saccus widely triangular and a little more than three-fourths the length of the gnathos. Valvae widest at the median, narrowing to an acute, blunt triangle at the proximal end and narrowing slightly then even in width toward the distal end to a U-shaped terminus. Aedeagus nearly even in width throughout, widening at the proximal one-third and terminating in a wide V-shape.

Distribution: May be found in Argentina in the southwest of Chubut province near Lago Blanco at 700-1000m above sea level.

Specimens examined: Argentina, Chubut province, male BMNH#808379, female BMNH#808378, 5 males BMNH#808586-808590

*Cosmosatyrus stelligera* (Butler, 1881) (*Faunula*) n. comb.

Type locality: Termas de Chillán, Chile

Holotype: BMNH (male) Photo Negative No. 43399-400, Slide No. 16,911 (Photo examined)

Discussion: Elwes (1903) noted its association with a dwarf *colihue* bamboo (*Chusquea culeou?*) and suggested this as the larval host plant. Diagnosis: Easily distinguished by the oval hindwing, the wide, pale postmedian band with dentate borders on the ventral side of the hindwing, and the white ocelli with weak black borders in each cell between Rs and 1A+2A. Dorsal sides

of most specimens without red markings on either wing, but some specimens may bear rust orange markings along the postmedian bands of both wings. Male genitalia similar to *Neosatyrus shajovskoi*, but with the uncus widest at the base rather than at the median, the valvae triangular at the proximal end and more blunt at the distal end, the aedeagus lacking lateral dentate projections and more even in width than in *N. shajovskoi*. Males and females very similar in appearance, but the females tend to be lighter in color.

Head: Antennae 7-8mm with white and dark coffee scales, terminating in a spatulate club. Eyes round and naked, length approximately 1.2 times greater than width. Palps white to tan, chocolate, and dark chocolate. Terminal palp segment cylindrical and less than one-fourth the length of the second segment.

Thorax with iridescent black scales and chocolate to dark chocolate piliform scales in the males. Females with iridescent black scales and cream and chocolate brown piliform scales. Abdomen tan to tawny in the females. Forelegs in both sexes with three tarsal segments. Midlegs and hindlegs with four rows of black spines on the tibia and tarsus.

Forewing: Wingspan 24-28mm. Termen slightly convex and the distal end of the discal cell deeply sinuous, the distance between M1-M2 much longer than the distance between M2-M3. Males are without visible androconia. Dorsal side chocolate to dark chocolate brown with fringe scales the same color. Some specimens may have a long rectangular rust orange patch between M3-CuA1. Ventral side the same color as the dorsal side with a rust orange to rust red patch

extending over the discal cell to just past the median. Postmedian band obscured in some specimens, but sometimes visible as a band of slightly lighter brown, the median border dark coffee and deckle-edged. Apical ocellus between M1-M3 may appear as a single, round, black, bipupillate ocellus ringed in tan to chocolate or rust red or as two separate unipupillate ocelli, fused at M2.

Hindwing: Wing oval, termen convex and entire. Dorsal side and fringe scales similar in color to the forewing and long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Chevron-shaped patches of rust orange sometimes appear at the postmedian band between M2 and CuA2. Ventral side also similar in color to the forewing, the postmedian band a slightly lighter brown with scalloped borders in dark chocolate to dark coffee, the median border stronger than the subterminal border. A single white ocellus weakly ringed in black is present in each cell between Rs and CuA2 and the cell between CuA2-1A+2A has two such ocelli.

Male Genitalia: Uncus finger-like and nearly even in width throughout, slightly wider where it joins with the tegumen, terminating in a blunt end, and almost 1.3 times the length of the tegumen. Gnathos acute and half the length of the uncus. Pedunculus short, wide, and U-shaped. Saccus widely U-shaped, nearly deltoid, and a little more than three-fourths the length of the gnathos. Valvae widest at the median, narrowing to an acute, blunt triangle at the proximal end, narrowing slightly and then even in width toward the distal end to a blunt finger-like

terminus. Aedeagus nearly even in width throughout, the proximal half slightly wider and terminating in a flattened U-shape.

Distribution: Can be found in Chile from eastern Bío-Bío province to eastern Los Ríos province and in western Neuquén province in Argentina from December to March at 200-1850m above sea level.

Specimens examined: Chile, Bío-Bío province, (BMNH) Holotype: male, Photo Negative No. 43399-400, Slide No. 16,911 (Photo examined); (MTSU) female CH24A-1; (CU) 1 male; (MGCL) 1 male, 1 female; Chile, Araucanía province, (CU) 1 female

*Cosmosatyrus leptoneuroides* C. Felder & R. Felder, 1867

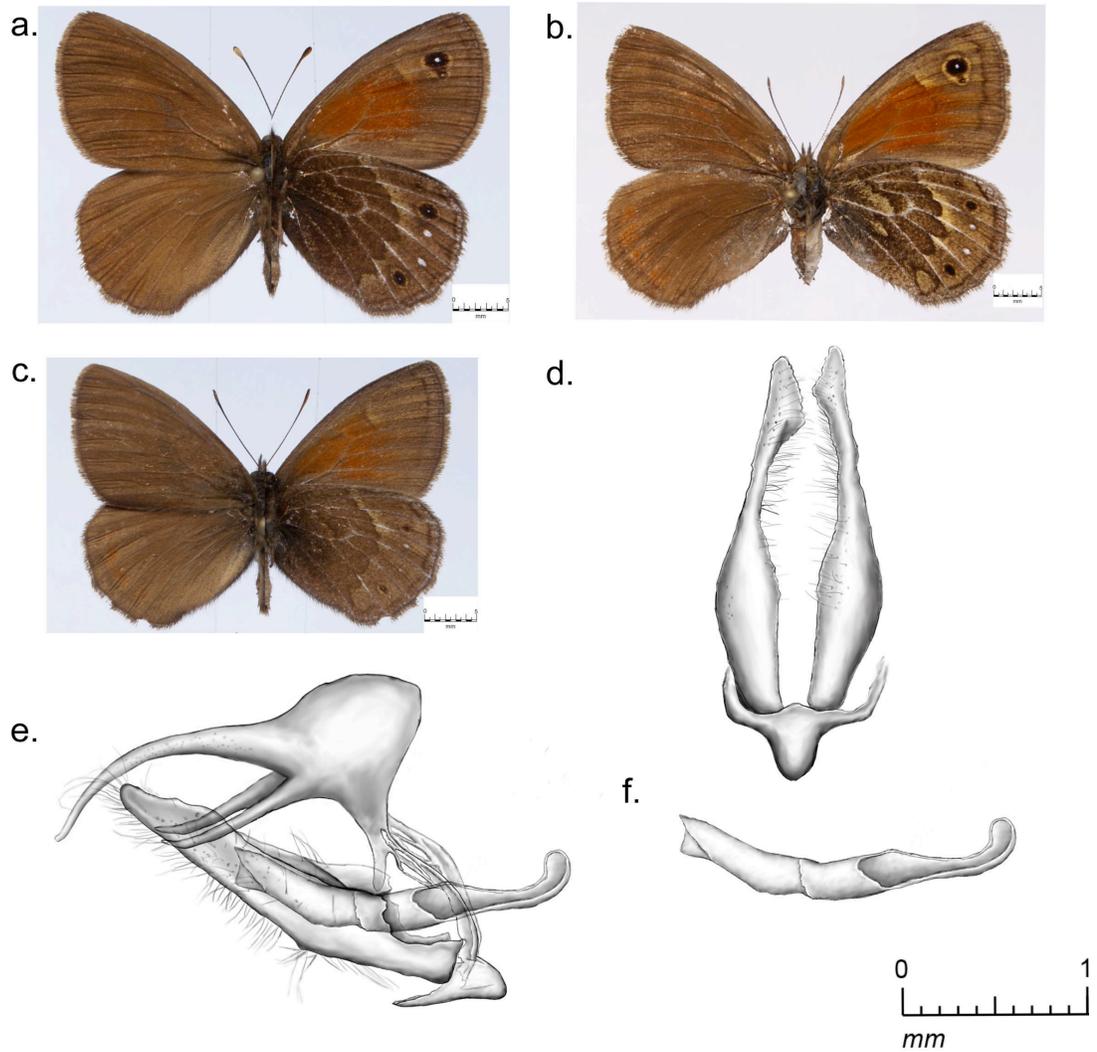


Figure 3-1. (a) Male dorsal (left) and ventral (right), female dorsal (left) and ventral (right), aberrant male dorsal (left) and ventral (right) specimens from UJ collection; (e-f) male genitalia CH15-7

*Cosmosatyrus dubii* (Pyrz, 2012) (*Faunula*) n. comb.

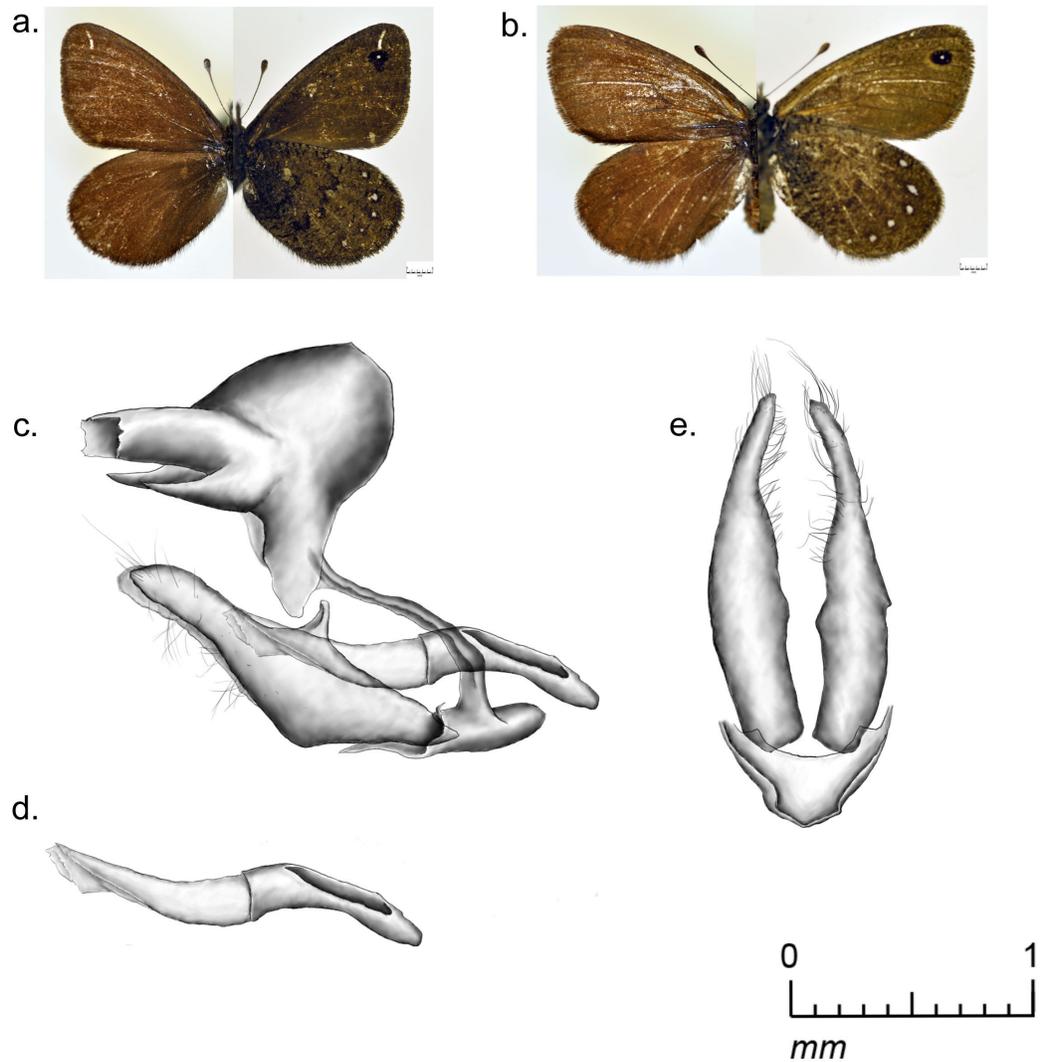


Figure 3-1. (a) Male dorsal (left), ventral (right) BMNH#808379, (b) female dorsal (left) and ventral (right) BMNH#808378, and (c-e) male genitalia. Note that uncus is broken in specimen BMNH#808379.

*Cosmosatyrus stelligera* (Butler, 1881)(*Faunula*) n. comb.

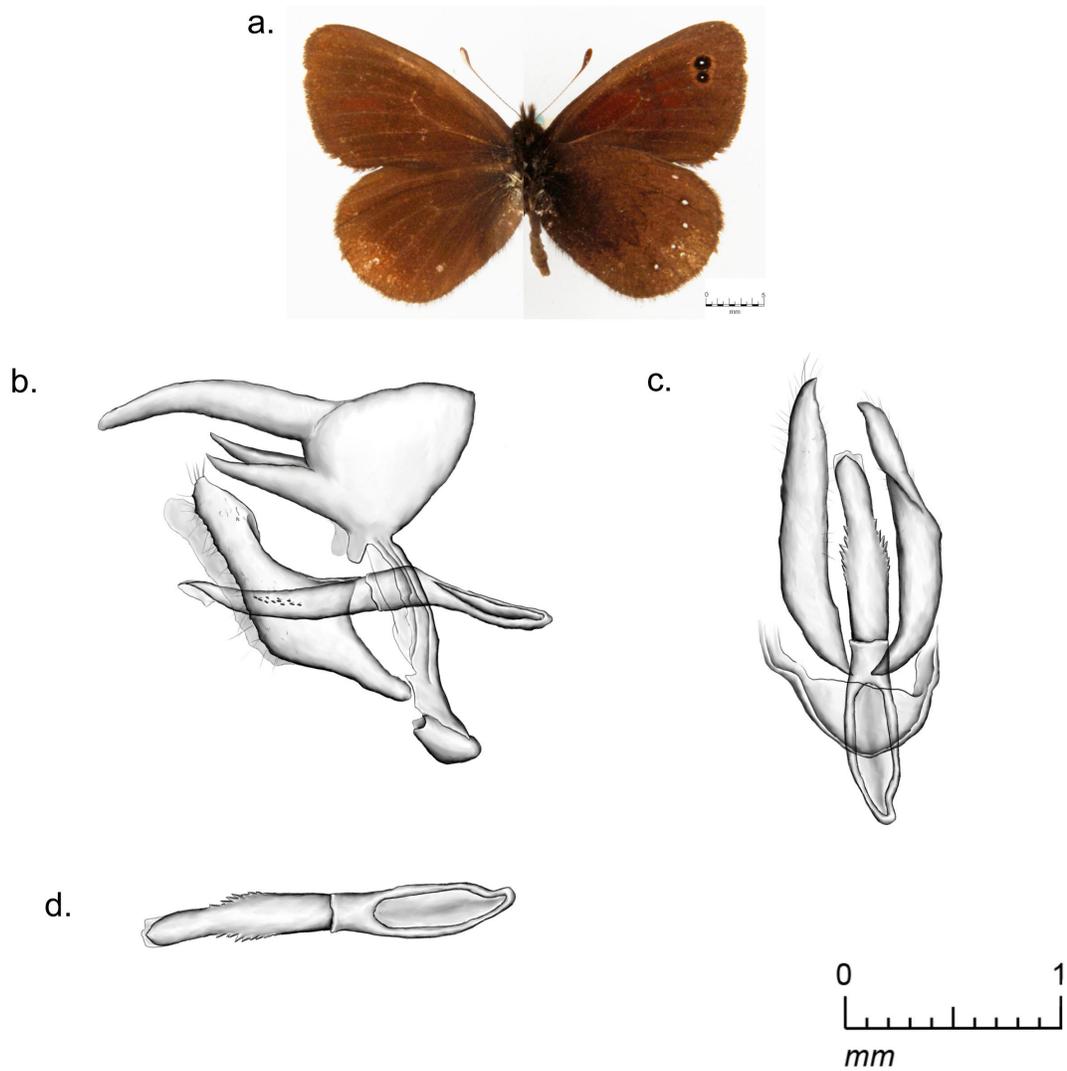


Figure 3-2. (a) Male dorsal (left) and ventral (right) BMNH#809772, (b-d) male genitalia from the UJ collection showing ornamentation on the aedeagus (d)

*Elina* Blanchard, 1852

Type species: *E. vanessoides* Blanchard, 1852

This genus is most easily distinguished by the mottled patterning on the dorsal side of the forewing that includes an apical ocellus between M1-M3 appearing as an indistinct unpupillated patch of dark chocolate brown to black and a hindwing with a deeply scalloped termen. Fringe scales on the forewing are layered in ivory and dark chocolate, giving the appearance of fine crenulation. Antennae terminate in a spatulate club. Eyes are hairy, more sparsely in *montrolii* than in *vanessoides*, palps are longitudinally striped, and foreleg tarsi are unsegmented in both sexes. Genitalia are similar, but unremarkable, the uncus widest where it joins the tegumen and the aedeagus nearly even in width throughout, unadorned by serrations. Distributions span Valparaíso to central Los Lagos provinces with both species located in Araucanía to northern Los Lagos province.

*Elina vanessoides* Blanchard, 1852

Type Location: Chiloé Island, Chile

Holotype: (male) BMNH #809684 (Specimen examined)

Diagnosis: Most similar to *Elina montrolii*, but smaller, with distinct ocelli on the ventral side of the hindwing, and the ocelli between M1-M2 and M2-M3 on the forewing unpupillated. Ripple pattern on the ventral side of both wings is not as high contrast as in *E. montrolii*. Postmedian band of the hindwing is deckle-edged on both sides with the proximal border edged in white to ivory and bearing an oval, black, unpupillated ocellus ringed in maize yellow between Rs-M1, M1-M2, CuA1-CuA2. Either one or two similar ocelli are found between CuA2-1A+2A and occasionally between M2-M3.

Head: Antennae 10-12mm and sparsely covered in dark coffee scales, terminating in a spatulate club. Eyes oval and hairy, length approximately 1.6 times the width. Palps with a longitudinal cream to ivory stripe along the median with the dorsal side and ventral side piliform scales dark coffee to black. Terminal palp segment cylindrical and about one-third the length of the second segment.

Thorax dark sepia, nearly black with iridescent black scales and covered in barnwood grey piliform scales that are tipped with ivory. Abdomen dark chocolate with warm medium brown piliform scales dorsally and ventrally ivory to dark chocolate with ivory piliform scales. Foreleg tarsi club-like and with two segments in both sexes. Midlegs and hindlegs with four rows of amber spines on the tibia and tarsus.

Forewing: Wingspan 35-40mm. Termen slightly concave and the distal end of the discal cell sinuate with the cubital end straighter than the radial end. Males with an androconial patch extending along the cubitus from M3 to just past

CuA2 and about 3mm at the widest. Dorsal side dark chocolate to dark chocolate brown, rust orange over the discal cell, and yellow-orange over the postmedian band. Fringe scales are dark chocolate layered over ivory, giving the false appearance of crenulation at the termen. Apical ocelli between M1-M2 and M2-M3 are present as indistinct unpupillated round patches of dark coffee brown. Ventral side dark chocolate brown and rust orange over the discal cell with an orange-yellow to mustard yellow postmedian band. Ripple pattern appears at the costa, extending over the radials where the postmedian band is white at each distal and proximal edge and dark chocolate brown in the center. Postmedian band has an irregular border edged in dark coffee brown that is wide at the costal end, narrow between M3-CuA1, wider between CuA1-CuA2, and narrow again at the inner margin. Apical ocelli between M1-M2 and M2-M3 appear as on the dorsal side, but with the edges a little more defined.

Hindwing: Wing trapezoidal, termen slightly convex and scalloped. Inner margin excavated between anal vein and 1A+2A. Dorsal side dark chocolate brown with a patch of rust orange between M1-CuA1 over the postmedian band. Postmedian band appears slightly lighter than the rest of the wing between from the costa to M1 and from CuA1 to the tornus with an irregular dark coffee brown border along the distal edge. Fringe scales are as in the forewing and long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side with a ripple pattern superimposed over all design elements, dark chocolate and dark coffee from the

base to the median, cream and ivory at the proximal edge of the postmedian band, chocolate and dark chocolate from the center to distal edge of the postmedian band, and returning to dark chocolate and dark coffee from the distal edge of the postmedian band to the termen. A lavender patch with a chocolate ripple pattern is situated between the costa and M2 and from the termen to the center of the postmedian band. Postmedian band is deckle-edged on both sides with a thin, crisp outline in dark coffee brown. An oval, black, unpupillated ocellus ringed in maize yellow is situated between Rs-M1, M1-M2, CuA1-CuA2. Either one or two similar ocelli are found between CuA2-1A+2A and occasionally between M2-M3.

Male genitalia: Uncus widest at the base, narrowing gradually toward the distal end and approximately 1.1 times the length of the tegumen. Gnathos wide, narrowing gradually toward an acute distal end, serrate at both dorsal side and ventral side edges, and a little less than half the length of the uncus. Pedunculus U-shaped. Saccus U-shaped and more than half the length of the gnathos. Valvae generally triangular, widest at the median and narrowing gradually toward the proximal end. Aedeagus nearly even in width and truncate at the proximal end.

Distribution: Can be found in Chile from Araucanía province to the southernmost border of Los Lagos province in February and March at 20-1100m above sea level.

Specimens examined: Chile, Araucanía province, (MGCL) 1 male, (CU) 1 male, 1 female; Chile, Los Lagos province, (BMNH) Holotype 809684 Chile, unknown province, (BMNH) 809674, (UJ) 2 males; Argentina, unknown province (BMNH) 809692

*Elina montrolii* (Feisthamel, 1839) (*Satyrus*) repl. name

Type Location: Chile

Holotype: (female) BMNH 809741

= *Satyrus lefebvrei* Guérin-Méneville, [1838], preocc. (not Boisduval, 1828)

Type location: Chile

Holotype: (female) MNHN, Paris (Photo examined)

Discussion: Originally described as *Satyrus lefebvrei*, this name was preoccupied by the Pyreneean *Satyrus lefebvrei* Boisduval, 1828 (now placed in *Erebia*), and Feisthamel proposed *S. montrolii* as a replacement. This species is the largest of the Neomaeniti and quite distinctive. The larvae, as described by Weymer (1911), is light brown with black longitudinal stripes, with the head bearing two black lines and a “light spiracular line, bordered with black beneath” and the pupa is light brown with black markings. Weymer claims the larva lives on a species of *Chusquea* bamboo referred to as “coligne” and matures by October with the adult appearing in November and December. Neither Weymer nor Elwes (1903) found this species in the mountains and Elwes described it as

settling on tree trunks in shady woods. A. Brower (pers. obs.) concurs with this observation.

Diagnosis: Most similar to *Elina vanessoides*, but much larger, without ocelli on the ventral side of the hindwing. Forewing and hindwing are scalloped at the termen and the apical ocellus on the ventral side of the forewing is bipupillate extending just past the borders of M1-M3. Ripple pattern is evident on the costal and terminal border of the ventral side of the forewing and over the entire hindwing. Postmedian band is widest at the costa and cream with chocolate to dark chocolate striations and a narrow dark coffee to chocolate patch that bisects the postmedian band longitudinally from the costa to M1. Eyes are hairy as in *E. vanessoides*, but more sparsely so.

Head: Antennae 17-20mm and covered in dark chocolate to chocolate and ivory scales, the females being lighter, and terminating in a spatulate club. Eyes oval and hairy, length approximately 1.3 times the width. Palps with a longitudinal dark chocolate stripe along the median, the dorsal side piliform scales white to ivory proximally and chocolate brown distally and the ventral side piliform scales medium brown and ivory throughout. Terminal palp segment oval and a little less than one-fourth the length of the second segment.

Thorax dark sepia and clothed with iridescent black with black and ivory piliform scales on the males and white and dark coffee brown with black and cream piliform scales on the females. Female abdomen ivory to tan ventrally and

taupe dorsally. Foreleg tarsi unsegmented in both sexes, but clublike in the males and the females bearing three pairs of spines at the distal end.

Forewing: Wingspan 52-60mm. Termen scalloped and the distal end of the discal cell V-shaped with the distance between M1-M2 slightly shorter than M2-M3. Males with an androconial patch along the radius, extending beyond the discal cell to the costa, over the radial veins, and to the cells between M1-M2 and M2-M3. Dorsal side rust red from the discal cell to the postmedian band, which is pale yellow at the apical end and rust orange toward the tornus. Costa has a narrow band of dark chocolate and tan ripple pattern and the subcosta, termen, and inner margin are widely bordered with chocolate to dark chocolate brown. Fringe scales are dark chocolate layered over ivory, giving the false appearance of crenulation at the termen. Apical ocellus between M1-M3 appears as an indistinct patch of dark coffee brown to black. Ocellus between CuA1-CuA2 is round, dark coffee to black, and not visible in all specimens. Ventral side with a wide dark chocolate to dark coffee and cream to taupe ripple pattern border along the costal and terminal edges, rust red from the discal cell to the postmedian band. Postmedian band is pale yellow to rust orange and has an irregular border edged in dark coffee brown that is wide at the costal end, narrow between M3-CuA1, wider between CuA1-CuA2, and narrow again at the inner margin. Apical ocellus between M1-M3 extends just past the borders of those cells and is oval, black to dark coffee brown, and bipupillate. Ocellus between

CuA1-CuA2, when present, is round, black to dark coffee brown, and may be unipupillate.

Hindwing: Wing oval, termen convex and scalloped. Inner margin excavated between anal vein and 1A+2A. Dorsal side chocolate to dark chocolate brown with the postmedian band rust orange to rust red and thinly bordered on the distal edge with dark coffee brown. Fringe scales are as in the forewing and long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side with a ripple pattern superimposed over all design elements, chocolate to tan with dark coffee striations from the base to the postmedian band and from the distal edge of the postmedian band to the termen. Postmedian band is deckle-edged on both sides but irregularly dentate at the proximal edge from the costa to M3. Postmedian band is widest at the costa and cream with chocolate to dark chocolate striations. A narrow dark coffee to chocolate patch bisects the postmedian band longitudinally from the costa to M1.

Male genitalia: Uncus widest at the base, narrowing gradually toward the distal end and approximately 1.1 times longer than the tegumen. Gnathos acute and a little more than half the length of the uncus. Pedunculus short and U-shaped. Saccus U-shaped and a little shorter than the gnathos. Valvae nearly even in width throughout, narrowing at the distal one-third to an acute point. Aedeagus nearly even in width and U-shaped at the proximal end.

Distribution: Can be found in Chile from Valparaiso province to northern Los Rios province and in Argentina in the westernmost portion of Rio Negro province from mid-December to early March at nearly sea level to 1100m above sea level.

Specimens examined: Chile, Maule province, (MGCL) 1 female; Chile, Bío-Bío province, (OSU) 000093693, 000093698, 000093699, 000093698 (MTSU) CH24B-05-CH24B-08, CH25-1, CH25-2; Chile, Araucanía province, (MGCL) 1 male; Chile, Los Ríos province, (BMNH) 809699, Chile, unknown province, (BMNH) Holotype 809741; Argentina, Rio Negro province, (UJ) 1 male, 1 female

*Elina vanessoides* Blanchard, 1852

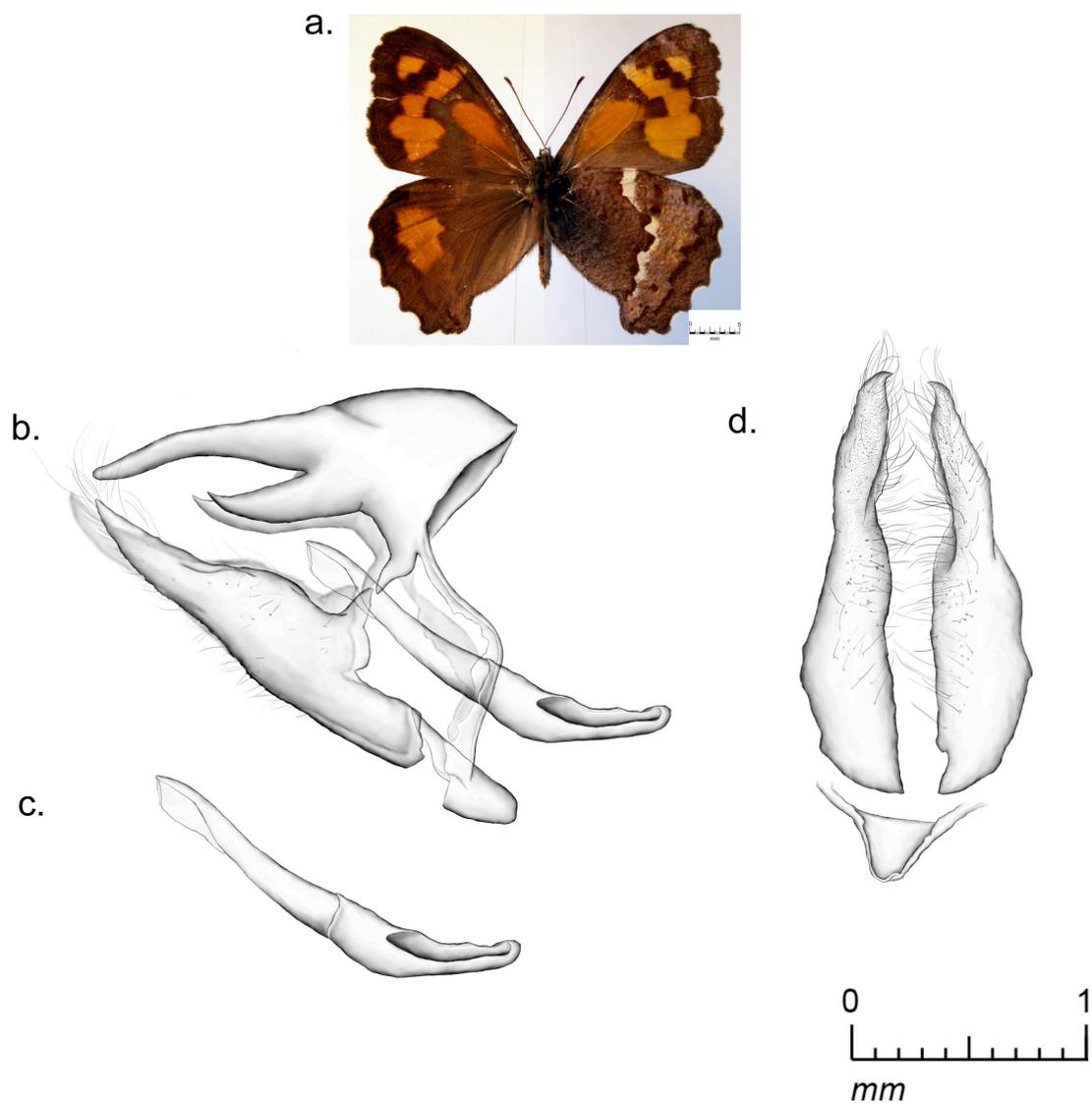


Figure 4-1. (a) Male dorsal (left) and ventral (right) specimen from the UJ collection, (b-d) male genitalia from CU collection

*Elina montrolii* (Feisthamel, 1839) (*Satyrus*) repl. name

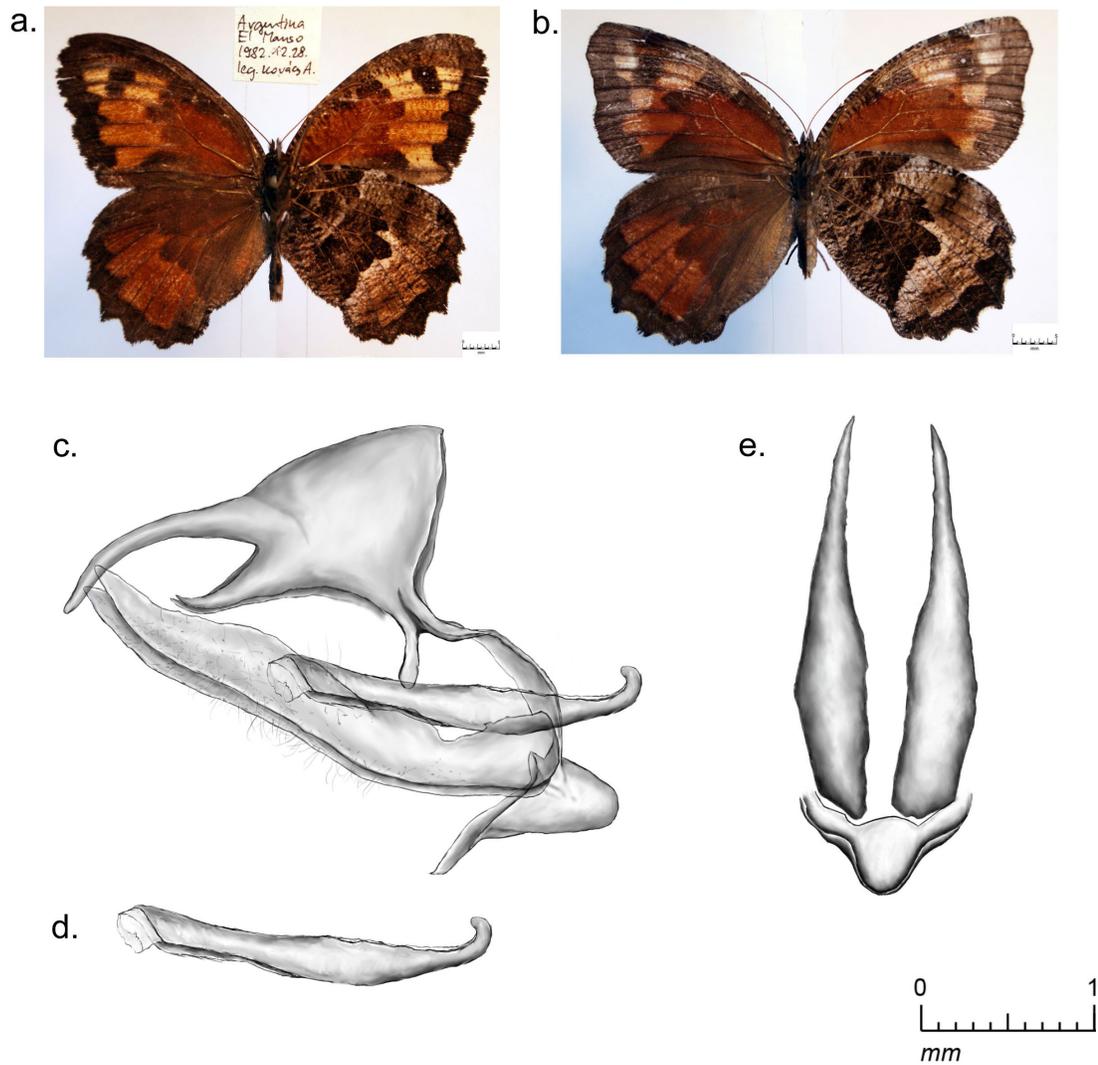


Figure 4-2. (a) Male dorsal (left) and ventral (right) and (b) female dorsal (left) and ventral (right) from the UJ collection, (c-e) male genitalia CH25-1

*Neomaenas* Wallengren, 1858

Type species: *N. servilia* Wallengren, 1858

Like *Auca*, *Neomaenas* bears a well-developed M1-M3 ocellus on the ventral side of the forewing and a trapezoidal hindwing, barely crenate at the termen with the wing excavated between 1A+2A and the anal vein. Though specimens were unavailable to study more thoroughly, the holotype of *N. inornata* fits this profile of *Neomaenas*, its VHW patterning similar to that of *N. simplex*, but with a single white ocellus ringed in black in each cell between Rs and M2 and lacking the white M3 triangle. With the exception of *N. simplex* and *N. inornata*, *Neomaenas* will have a clearly defined postmedian band on the ventral side of the hindwing or a strongly contrasting pattern as in *N. edmondsii*. Antennae terminate in a spatulate club and eyes may be naked as in *N. servilia* and *N. simplex*, sparsely hairy as in *N. poliozona*, *N. coenonymphina*, and *N. wallengrenii*, or hairy as in *N. monachus*. All except *N. monachus* are without androconia on the forewings of males. Most have unsegmented foreleg tarsi, *N. fractifascia* with both males and females having three tarsal segments and *N. servilia* females with four tarsal segments. *N. wallengrenii* exhibits unarticulated pseudosegmentation in the females. Palps are usually striped longitudinally, except *N. poliozona* and *N. wallengrenii*, all species with the terminal segment cylindrical. Male genitalia with the uncus narrow and finger-like, *N. monachus* slightly wider at the base, and with the aedeagus usually unadorned, except *N. tristis* which has miniscule serrations at the distal end. This genus is distributed in

Chile from southern Valparaiso to northern Los Lagos province with many species that can be found in the vicinity of Termas de Chillán in Bío-Bío province.

*Neomaenas servilia* Wallengren 1858

Type Location: Valparaiso, Chile

Holotype: (male) NRM, Stockholm (photo examined)

= *Stibomorpha decorata* Butler 1874

Type Location: "High Mts. St. Jago," Chile

Holotype: (female) BMNH #809633 (specimen examined)

Diagnosis: Similar to *N. fractifascia*, but without the ripple pattern on the ventral side of the hindwing and with the proximal edge of the postmedian band irregularly dentate and white at each point. The yellow band that crosses the discal cell in *N. fractifascia* and *N. wallengrenii* is part of an M-shaped patch over the base in *N. servilia* that peaks CuA1 meets the discal cell and again at the median of 1A+2A with the base black to steel grey. As in *N. fractifascia* and *N. wallengrenii*, a large ocellus appears between CuA1-CuA2, but is unipupillate in *N. servilia*. Additional ocelli appear on the ventral side of the hindwing in each cell between Rs and CuA1, these smaller than that between CuA1-CuA2 and appearing as white spots, white spots ringed in yellow, or round, unipupillate black spots ringed in yellow. Tarsi of the forelegs are sexually dimorphic, the

males having short, clublike, unsegmented tarsi and the females having long, slender tarsi with four segments.

Head: Antennae 8-10mm and covered in white scales at the base and chocolate to dark chocolate scales over the remainder of the filament, terminating in a spatulate club. Eyes oval and naked, length approximately 1.3 times the width. Palps with a longitudinal white stripe along the median and an adjacent black stripe ventral side to the median. Dorsal side piliform scales are ivory at the base and warm medium brown distally with ventral side piliform scales black and white to ivory. Terminal palp segment cylindrical and about two fifths the length of the second segment.

Thorax dark sepia and clothed with iridescent black scales on the males and white and iridescent black scales on the females. Long piliform scales white and ivory in the females and ivory and medium brown in the males. Abdomen of both sexes ivory and tan dorsally and ventrally chocolate to taupe. Foreleg tarsi long, slender, and with four segments in the females and short, club-like, and unsegmented in the males. Midlegs and hindlegs with four rows of dark amber spines on the tibia and tarsus.

Forewing: Wingspan 26-30mm. Termen nearly straight and the distal end of the discal cell widely V-shaped with M1-M2 shorter than M2-M3. Males with no visible androconial patch. Dorsal side rust orange over the discal cell, bordered in chocolate to taupe, the females being somewhat lighter than the males. Fringe scales ivory to tawny and apical ocelli between M1-M2 and M2-M3 appearing as

small black spot with a barely noticeable chocolate to taupe pupil. Both ocelli are surrounded with a circular patch in chocolate to taupe. Ventral side tangerine to orange-yellow with the postmedian band slightly lighter and bordered in pale yellow to cream, particularly closest to the costa. Borders of the postmedian band nearly straight, but with an inward-facing U-curve between M3-CuA1. Terminal band may be uniformly chocolate to taupe or fading to daffodil yellow to cream with a thin strip of white along the distal edge. Apical ocellus between M1-M3 ringed in daffodil yellow, with a single white pupil in each cell, and extending just past the confines of the cells. An additional unipupillate ocellus bordered in daffodil yellow sometimes appears between M3-CuA1.

Hindwing: Wing trapezoidal, termen slightly convex and barely scalloped. Inner margin excavated between anal vein and 1A+2A. Dorsal side chocolate brown to taupe with a thin band of rust orange along the terminal edge of the postmedian band. Fringe scales are as in the forewing and long piliform scales appear on both sexes at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side with an M-shaped patch over the base with one side extending diagonally across the discal cell to a peak where CuA1 meets the discal cell and peaking again at the median of 1A+2A, edged in daffodil yellow to cream with the base black to steel grey. Proximal edge of the postmedian band deeply and irregularly dentate, tipped in white. Distal edge daffodil and deckle-edged. Center of the postmedian band in chocolate to taupe with an ocellus in each cell between Rs and CuA2. Ocellus

between CuA1-CuA2 large, black, unipupillate, and ringed in daffodil yellow. Ocelli in each cell between Rs and CuA1 may be either a small white spot, a white spot ringed in yellow, or a small round black unipupillate ocellus ringed in yellow. Subterminal band chocolate to taupe and terminal band cream to white.

Male genitalia: Uncus narrow and finger-like, approximately 1.1 times longer than the tegumen. Gnathos acute and a little more than half the length of the uncus, pedunculus long and U-shaped, and saccus U-shaped and approximately the same length of the gnathos. Valvae widest at the median, narrowing abruptly at the distal one-third to about half the width, and deltoid at the terminus.

Distribution: Can be found in Chile from the southern part of Valparaiso and central Santiago Metropolitan provinces southward to southern Maule province from December to March at 90-850m above sea level.

Specimens examined: Chile, Valparaiso province, (MTSU) CL1023, CL1024; Chile, O'Higgins province, (CU) 1 male, 1 female, (MGCL) 1 male; Chile, unknown province, (BMNH) Holotype female *Stibomorpha decorata* 809633, (MGCL) 1 male

*Neomaenas coenonymphina* Butler, 1881

Type Location: Valparaiso, Valparaiso province, Chile

Lectotype: (male) BMNH #809622 (specimen examined)

Paralectotype: BMNH #809623 (specimen examined)

Discussion: Two specimens in the British Museum are labeled as the types of *N. coenonympha* and I have designated the male, marked with the Valparaiso locality, as the lectotype. Butler notes that it is rare around Valparaiso in December and January, but I found it to be not uncommon in that region in late February to early March on hillsides near Casablanca (33°19'S, 71°24'W).

Diagnosis: Most similar to *N. poliozona*, but with the postmedian band of the ventral side hindwing daffodil yellow and golden instead of lavender and the apical ocellus between M1 and M2 on the ventral side of the forewing usually bipupillate.

Head: Antennae 8-9mm, covered in white to tan scales and terminating in a spatulate club. Eyes sparsely hairy and oval, length approximately 1.25 times the width. Palps striped longitudinally with black and white scales with bronze-brown piliform scales on the ventral side. Terminal palp segment cylindrical and less than one-third the length of the second segment.

Thorax black to very dark bronze-brown and covered in bronze to tan scales. Scales of the abdomen ranging from beige to tan to medium brown, slightly darker on the males than the females. Forelegs of both males and females with tarsus club-like, unsegmented, and without spines. Midlegs and hindlegs with four rows of black spines on the tibia and tarsus.

Forewing: Wingspan 30-35mm. Males with no visible androconial patch. Termen nearly straight and discal cell V-shaped at distal end with distance

between M1-M2 slightly shorter than distance between M2-M3. Dorsal side medium brown to dark chocolate brown, darker toward the distal edges and slightly lighter in the females. Fringe scales striped perpendicular to the wing margin in dark chocolate brown and tawny. Postmedian band appearing on the dorsal side in rust orange, but not as distinctly as on the ventral side. Apical ocellus between M1 and M2 appearing as a nearly black spot on the dorsal side in both sexes, but clearer in the females. Ventral side rust orange and widely bordered in medium to chocolate brown with a ripple pattern visible at the costal edge and apex. Postmedian band orange with a thin, dark brown border and nearly even in width, scalloped at the distal edge with the proximal edge nearly straight, curving sharply inward between M3 and CuA1. Apical ocellus usually bipupillate and ringed in light daffodil yellow. Pupils white, the more apical of which is often bigger.

Hindwing: Wing shape trapezoidal. Termen slightly convex and barely scalloped between median veins and tornus and the inner margin excavated between the anal vein and 1A+2A. Dorsal side medium brown to dark chocolate brown, darker toward the distal edges and slightly lighter in the females. Fringe scales striped in dark chocolate brown and tawny. Postmedian band appearing in rust orange to rust red on the dorsal side, strongest from M2 to the anal margin and again more clearly in the females than in the males. Long piliform scales appearing on both sexes at the base and over the discal cell, extending to the median. Ventral side chocolate to dark bronze brown with ripple pattern over

most of the wing. Postmedian band widest toward costa, narrowing slightly at M1, but almost even in width throughout. Postmedian band is light daffodil yellow at proximal border, fading to golden distally with the distal border deckle-edged. A small, black, round, unpupillated ocellus ringed in yellow is present between Cu1 and Cu2. Often, a similar ocellus appears between R5 and M1 and occasionally between CuA2 and 1A+2A.

Male genitalia: Uncus narrow and finger-like, approximately the same length as the tegumen. Gnathos acute and approximately four-tenths the length of the uncus. Pedunculus long and attenuating at terminus and the saccus is U-shaped. Valvae wide, beginning to narrow at midpoint with the most distal quarter nearly deltoid. Aedeagus is nearly even in width throughout, the proximal end slightly narrower with a truncate terminus.

Distribution: Found from Santiago to Valparaiso province, Chile from January to March at 200-600m above sea level. Original description states that specimens were collected as early as December.

Specimens examined: Chile, Valparaíso province, (MTSU) CL1001-CL1009, (MGCL) 1 male, (BMNH) Lectotype male 809622; Chile, Santiago Metropolitan province, (OSU) 000093354; Chile, Maule province, (MTSU) CH26-1; Chile, unknown province, (BMNH) Paralectotype 809623

*Neomaenas edmondsii* (Butler 1881) (*Argyrophenga*)

Type location: Termas de Chillán, Chile

Holotype: (male) BMNH #809630

Discussion: Originally placed in the New Zealand genus, *Argyrophenga*, Elwes (1903) described it as an *Epinephele*, and Weymer (1911) finally placed it in *Neomaenas*. It is a rare species found around scrubby bushes near shady wooded areas on the mountainsides of eastern Araucanía and Bío-Bío provinces. Though it is not a fast flier, it can be difficult to catch, taking short, low flights between bushes.

Diagnosis: Most similar to *N. wallengrenii*, but smaller and generally darker with the patterning on the ventral side of the hindwing resembling a series of yellow stripes radiating from the base of the wing. Dorsal side of both wings dark chocolate brown in the males and warm light brown in the females with patches of rust red or rust orange over the discal cells of the forewings and between M2-M3 on the hindwing. Smaller rusty patches appear between M3-CuA1 and CuA1-CuA2 on the hindwing. Ventral side of the hindwing with a strong daffodil yellow stripe that extends from the base of the wing almost to the termen over the discal cell to the cell between M2-M3. Maize yellow postmedian band is edged with white and brown scales at the termen and all but the 1A+2A and anal veins are highlighted with daffodil yellow over the band.

Head: Antennae 6-8mm, bearing ivory and medium brown scales on the dorsal side, and terminating in a spatulate club. Eyes oval and sparsely hairy length approximately 1.25 times width. Palps with a longitudinal black stripe

along the median with a similar tan stripe parallel and dorsal side to the black stripe. Piliform ventral side scales of the palps medium brown, black and tan in the males and black, tan, and ivory in the females. The dorsal side scales ivory in the females and medium brown or black in the males, terminal segment cylindrical and a little more than one-third the length of the second segment.

Thorax nearly black in both sexes. The females are covered in ivory and iridescent black scales with the longer piliform scales being ivory and tan and the males are clothed mainly with iridescent black with the piliform scales being a warm medium brown. Male and female foreleg tarsi unsegmented and club-like, the male tarsus slightly longer relative to the tibia. Midlegs and hindlegs with four rows of amber spines, darker amber in the males.

Forewing: Wingspan 22-30mm. Tergites slightly convex. Discal cell U-shaped at the distal end with the distance between M1-M2 slightly shorter than between M2-M3. Dorsal side warm light brown in the females and dark chocolate brown in the males, both with a rust red patch over the discal cell and a small black ocellus between M1-M2 that may have a single pupil in the females. Ventral side dark rust red to rust orange, widely bordered with medium to warm light brown and with a patch of maize yellow at the apex over the radial and median veins. Postmedian band wide and slightly lighter than rust-colored scales covering the discal cell. Ocellus between M1-M2 black, ringed in daffodil yellow with a single white pupil.

Hindwing: Wing oval, termen slightly convex and barely scalloped between median veins and tornus. Inner margin barely excavated between anal vein and 1A+2A. Dorsal side warm light brown in the females and dark chocolate brown in the males, both with a patch of rust red between M2-M3 that extends to the center of the discal cell and smaller patches between M3-CuA1 and CuA1-CuA2. Piliform scales appearing on both sexes at the base and over the discal cell, extending to the median and toward the inner margin, shorter in the females. Ventral side similar in hue to the dorsal side, black at the base and with a terminal band of white scales. Postmedian band very wide at the costa, the proximal edge extending to the base and then narrowing sharply toward the termen, constricted completely or to a few millimeters between M3 and CuA1, with sharp dentations that peak at CuA1 and CuA2. The pattern of daffodil yellow streaks across the wing may obscure the proximal border of the postmedian band that extends over the breadth of the wing in maize and daffodil yellow. The strongest of these is between M2-M3, extending over the discal cell to the wing base. Two smaller yellow streaks appear close to the base between CuA1-1A+2A and 1A+2A-anal vein. All except the 1A+2A and anal veins are highlighted in daffodil yellow over the postmedian band. Two lenticular black spots with thin daffodil borders appear between Rs-M1 and M3-CuA1.

Male genitalia: Uncus narrow and finger-like, approximately 1.1 times the length of the tegumen. Gnathos acute and a little less than half the length of the uncus, pedunculus short and U-shaped, and saccus truncate and nearly as long

as the gnathos. Valvae wide, narrowing to about half the width just past the median toward the distal end, deltoid at the terminus. Aedeagus nearly even in width and truncate at the proximal end.

Distribution: Found in Chile in the eastern part of Bío-Bío and Araucanía provinces from February to March at 650-1600m above sea level.

Specimens examined: Chile, Bío-Bío province, (BMNH) Holotype male 809630, (MGCL) 2 males; Chile, Araucanía province, (BMNH) 809662, 809663, (MTSU) CL0701-CL0709, (UJ) 9 males, (MGCL) 1 male

*Neomaenas fractifascia* Butler, 1881

Type location: near Termas de Chillán, Chile

Lectotype: (male) BMNH #809629 (specimen examined)

Paralectotype (female) BMNH #809628 (specimen examined)

Discussion: Two specimens, a male and a female are both labeled as “Type” in the British museum, both of which were collected in the same locality. I have designated the male as the lectotype. This is an uncommon species (Elwes, 1903; Weymer, 1911) and according to Elwes, “It frequents open places in the forest.”

Diagnosis: Similar to *N. wallengrenii*, the ventral side hindwing of both having a yellow band that crosses the discal cell from the subbasal costa to the cubitus and a large ocellus between Cu1-Cu2, but with the yellow band is more

distinct in *N. fractifascia*. The dorsal side forewings are chocolate to dark chocolate brown with patches of rust orange over the discal cell and at the postmedian band on the dorsal side forewing, the females being lighter. Ventral side of the forewing with a unipupillate and occasionally unpupillated apical ocellus between M1-M3 that extends just beyond the confines of the cells and a maize and chocolate ripple pattern at the costa. Dorsal side similar in color to the forewing with a rust orange patch at the postmedian band. Ventral side with a ripple pattern superimposed over the entire wing and a deckle-edged postmedian band in maize to chocolate that contains black ocelli in each cell between Rs-M2 and in each cell between M3-1A+2A, the largest ocellus between CuA1-CuA2. Ocelli may be absent or reduced in females in the cells between Rs-M2, M3-CuA1, and CuA2-1A+2A and are not as clearly demarcated as in the males.

Head: Antennae 7-9 mm and striped with ivory and dark chocolate brown scales, terminating in a spatulate club. Eyes oval and naked, length approximately 1.3 times the width. Palps with a longitudinal white stripe along the median and an adjacent black stripe on the ventral side to the median. Males with dorsal side piliform scales white at the base and black distally and with ventral side piliform scales black and tan. Females with fewer black scales, dorsal side piliform scales white at the base and tawny at the distal end, and ventral side piliform scales ivory with sparse black scales. Terminal palp segment cylindrical and about three-tenths the length of the second segment.

Thorax dark sepia and clothed with iridescent black scales on the males and ivory and iridescent black scales on the females, both sexes with toffee-colored piliform scales. Female abdomen tan ventrally and dorsally tan with dark chocolate stripes along the sutures of each segment. Male abdomen tan, taupe, and dark chocolate ventrally and dark chocolate dorsally. Foreleg tarsi with three segments in both sexes, the females being slightly more slender than the males. Midlegs and hindlegs with four rows of amber spines on the tibia and tarsus.

Forewing: Wingspan 28-24mm. Termen slightly convex and the distal end of the discal cell gently sinuate with M1-M2 shorter than M2-M3. Males with no visible androconial patch. Dorsal side rust orange over the discal cell and at the postmedian band, bordered in chocolate in the females and dark chocolate in the males. Fringe scales tan to tawny in the females and the males with dark chocolate layered over white, giving the false appearance of crenulation at the termen. Apical ocellus between M1-M2 appearing on the dorsal side in both sexes as an unpupillated round spot. Ventral side rust orange with the postmedian band yellow-orange outlined thinly in chocolate. Bordered in chocolate at the inner margin and tornus and with a maize and chocolate ripple pattern narrowly along the costa and extending over the subterminal to terminal portion of the radial and median veins. Apical ocellus between M1-M3 ringed in maize to daffodil yellow and with a single white pupil. Apical ocellus extends just past the confines of the cells and is unpupillated in some examples.

Hindwing: Wing trapezoidal, termen slightly convex and scalloped. Inner margin excavated between anal vein and 1A+2A. Dorsal side chocolate to dark chocolate brown with the postmedian band in rust orange. A single black ocellus appears between CuA1-CuA2 and another, smaller ocellus can sometimes be seen between M3-CuA1. Fringe scales are as in the forewing and long piliform scales appearing on both sexes at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side with a ripple pattern superimposed over all design elements, taupe and black at the base, maize and dark chocolate at the inner margin, maize and warm medium brown at the costa and along the postmedian band, and dark chocolate and maize that fades to dark chocolate and white at the terminal band. Postmedian band deckle edged on both sides with a thin, crisp outline in dark chocolate brown. Proximal border with a very thin white band that fades to maize, chocolate brown at the center, and then returning to maize at the distal border. A round black ocellus ringed in daffodil to maize may be found in each cell between Rs-M2 and in each cell between M3-1A+2A, the largest ocellus between CuA1-CuA2. In females, postmedian ocelli are not as clearly demarcated as in the males and are without the yellow ring. Ocelli may be absent or reduced in females in the cells between Rs-M2, M3-CuA1, and CuA2-1A+2A. In both sexes, a maize band about two millimeters wide extends from the subbasal costa diagonally across the wing to the cubitus, not extending past the discal cell.

Male genitalia: Uncus narrow and finger-like, approximately 1.5 times the length of the tegumen. Gnathos acute and a little less than half the length of the uncus, pedunculus long and U-shaped, and saccus U-shaped and a little longer than the gnathos. Valvae wide, narrowing abruptly at the distal one-third to about half the width and terminating in a U-shape. Aedeagus nearly even in width, narrowing in a slight hourglass curve at the distal one third with the proximal end terminating in a U-shape.

Distribution: Can be found in Chile from the eastern part of Bío-Bío province southward to Araucanía province, and in the western part of Neuquén and Rio Negro province, Argentina in January and February at 80-1620m above sea level. Abundant near Termas de Chillán and at a wider altitudinal range farther south.

Specimens examined: Chile, Bío-Bío province, (OSU) 000093669, 000093677, 000093666, 000093674, (MTSU) CH24B-03, CH24B-04, CH25-3, (BMNH) Lectotype male 809629, Paralectotype female 809628, (UJ) 1 male; Chile, Araucanía province, (UJ) 1 female

*Neomaenas monachus monachus* (Blanchard, 1852) (*Satyrus*) n. comb.

Type location: Chile

Lectotype: (male) MNHN, Paris, Genitalia P. Viette, Prep. no 4144 (Photo examined)

= *Epinephele valdiviae* C. Felder & R. Felder, 1867

Type location: Valdivia, Los Rios province, Chile

Lectotype: (male) BMNH #809780 (specimen examined)

Paralectotype: (male) BMNH #809781 (specimen examined)

= *Pedaliodes lugubris* Butler, 1870

Type location: Chile, probably Valdivia, Los Rios province, Chile

Holotype: (male) BMNH #809743 (specimen examined)

= *Satyrus luctuosus* Reed, 1877, nom. nud.

= *Maniola monachus sacerdos* Bryk, 1944

Type location: Lago Nahuel Huapí

Holotype: (male) NRM, Stockholm (photo examined)

Allotype: (female) NRM, Stockholm (not examined)

Paratypes (11 males, 4 females) NRM, Stockholm (not examined)

Discussion: Originally placed in *Satyrus*, this species was last described as *Quilaphoetus* by Herrera (1966) based primarily on subtle genitalic differences and variation in the position of the forewing radial veins, a feature that varies widely amongst individuals of the same species collected at the same locality. With the exception of the androconial patch in the males and densely hairy eyes, it is very similar to other members of *Neomaenas*, where Hayward (1958) had previously placed it. Elwes (1903) claims that it is “very abundant in the heavy virgin forest south of Temuco” and “amongst the dense bamboo

undergrowth in the Upper Renaico Valley.” *N. monachus monachus* may also be found in Chubut, Neuquén, and Rio Negro provinces, Argentina (Butler, 1881; Elwes, 1903). This species tends to fly over the tops of *Chusque* bamboos near forested areas, at a height of about 2.5-3m above the ground.

Diagnosis: Most similar to *Auca coctei*, but tending to be larger and darker in color. Males with heavy androconia in the cells between M3 and the inner margin. Ocellus between M1-M2 on the ventral side of the forewing is usually unipupillate. Postmedian band similar to *A. coctei*, but with both subterminal and median borders deckle-edged. Small, round ocelli are present in each cell between Rs and 1A+2A, the pairs closest to the costa and closest to the inner margin may be oval and black, ringed in cream to daffodil yellow while the center pair are usually white to daffodil yellow. Hindwing ocelli are sometimes obscured or absent. Eyes are hairy and foreleg tarsi of both sexes are unsegmented and club-like. Male genitalia appear more elongated in the uncus and gnathos and wider in the valvae than in *A. coctei*, but are otherwise similar.

Head: Antennae 8-10mm, covered in dark chocolate scales with a longitudinal daffodil yellow stripe, and terminating in a spatulate club. Eyes hairy and oval, length approximately 1.3 times width. Palps with a longitudinal black stripe bordered in white at the median, dark chocolate dorsally and dark chocolate and white ventrally, the terminal segment entirely dark chocolate. Females the same, but lighter in color. Terminal palp segment cylindrical and a little less than one-third the length of the second segment.

Thorax dark amber, males with iridescent black scales and tawny and black piliform scales. Females with white and iridescent black scales and tawny piliform scales. Male abdomens with coffee brown ? on the dorsal side and coffee brown? with sparse white and tawny scales on the ventral side. Females coffee dorsally and cream to taupe ventrally. Forelegs of both sexes with the tarsus club-like, unsegmented, and without spines. Midlegs and hindlegs with four rows of black spines on the tibia and tarsus.

Forewing: Wingspan 24-32mm. Males with androconia in chevron to rectangular patches in each cell between M3 and the inner margin. Termen nearly straight to slightly concave and barely scalloped. The distal end of the discal cell is sinuous with the costal half more deeply curved than the cubital half. Dorsal side dark chocolate brown to dark coffee brown with fringe scales in dark chocolate and white to cream, giving the appearance of crenulation. A reddish patch may be visible from the discal cell to the median and a round, black apical ocellus is usually visible between M1-M2. Ventral side chocolate to dark chocolate with a ripple pattern in dark chocolate to dark coffee striations extending from the costa to the radials and from the middle of the postmedian band to the termen. A rust orange to rust red patch extends from the discal cell to the postmedian band, covering the median and cubital veins, extending almost to the anal vein. Postmedian band is lightly bordered in dark chocolate to dark coffee, the median and subterminal sides deckle-edged. Rust orange to rust red patch lightens slightly inside the postmedian band. Apical ocellus between M1-

M2 is round, black, unipupillate, and ringed in rust orange to daffodil yellow. This ocellus occasionally extends from M1-M3 and may be bipupillate. Females are lighter in color than males.

Hindwing: Wing trapezoidal, termen slightly convex and scalloped, inner margin excavated between the anal vein and 1A+2A. Dorsal side and fringe scales similar in color to the forewing, the postmedian band sometimes appearing between M2 and CuA2 in triangular patches. Ventral side chocolate to dark chocolate brown with a ripple pattern in dark chocolate to dark coffee over the entire wing. Postmedian band lighter than the rest of the wing, with both median and subterminal borders deckle-edged, and wider over the radials than from Rs to the inner margin. Ocelli between Rs-M1, M1-M2, CuA1-CuA2, and CuA2-1A+2A are small and either oval and black, ringed in cream to daffodil yellow or round and white to daffodil yellow. Ocelli between M2-M3 and M3-CuA1 are small, round, and white to daffodil yellow.

Male genitalia: Uncus widest at the base, narrowing gradually to a blunt finger-like terminus, and approximately 1.25 times as long as the tegumen. Gnathos acute and a little more than half the length of the uncus. Pedunculus long and U-shaped. Saccus U-shaped and approximately four-tenths the length of the gnathos. Valvae widest at the proximal one-quarter, gradually narrowing toward the distal end, the terminus deltoid or somewhat falcate. Aedeagus hourglass-shaped at the distal three-fifths, narrowing slightly to a U-shaped proximal terminus.

Distribution: Can be found in Chile from Santiago Metropolitan province to northern Los Lagos province and in Argentina in Southern Neuquén province from mid-December to early March at nearly sea level to 1850m above sea level. Adults can be found flying around the tops of tall stands of bamboo.

Specimens examined: Chile, Bío-Bío province, (OSU) 000094359, 000094363, 000094373, (MTSU) CH24-1-CH24-5, (UJ) 1 female; Chile, Araucanía province, (MTSU) CL0810-CL0814, CL0721-CL0724(UJ) 9 males, 3 females; Chile, Los Lagos province, (OSU) 000094377, 000094372, 000094362, 000094375 (MTSU) CH10-1-CH10-3, CH10-8, CH10B-10, CH10B-11, CH10B-2, CH10B-6, CH10C-3, CH7-1

*Neomaenas monachus limonias* (Philippi, 1859)(*Satyrus*) n. comb.

Type location: Valdivia, Los Ríos province, Chile

Type: ??

= *Satyrus janirioides* Blanchard, 1852 preocc. (not *Satyrus janirioides* Herrich-Schäffer, 1851)

Type location: Chile

Holotype: (female) MNHN, Paris, genitalia prep. No. 4146 (photo examined)

= *Epinephele dryas* C. Felder & R. Felder, 1867

Type location: Chile

Holotype: (male) BMNH #809782 (specimen examined)

= *Epinephele blanchardii* W.F. Kirby, 1871, repl. name

= *Epinephele janirioides* var. *quinquepunctata* Silva, 1916

Type location: Lautaro, Araucanía province, Chile

Lectotype: MNHN, Santiago de Chile, Type No. 4043 (photo examined)

= *Epinephele limonias* var. *quinquepunctata* Silva, 1916

Discussion: Weymer (1911) and Gaede (1931) noted and Lamas (2010) agreed that Blanchard's *janirioides* was preoccupied by a species from Algiers and assigned to it the name of *limonias*, noting that it is identical with Philippi's description, which has priority over Kirby's replacement name *blanchardii*. Elwes (1903) found it "on dry hill-sides covered with bushes," and remarks that it is commonly found in Valparaíso in November and December.

Diagnosis: Identical to *Q. monachus monachus*, but generally lighter in color and more often with larger and bipupillate ocelli between M1-M3 on the ventral side of the forewing. Postmedian band on the ventral side of the hindwing is lavender from the costa to M2 and daffodil yellow from M2 to the inner margin. Small round yellow or white hindwing ocelli are present in each cell from Rs to 1A+2A, but may be obscured or absent.

Head: Male palps with a longitudinal daffodil yellow stripe at the median, the dorsal side chocolate brown, and the ventral side with a longitudinal chocolate brown stripe just below the yellow stripe at the median and with white, medium brown, and dark chocolate brown piliform scales. Female palps with a longitudinal white stripe at the median, white and chocolate brown dorsally, and

ventrally with a longitudinal chocolate stripe just below the median white stripe and white and black piliform scales.

Thorax bears iridescent black scales with black and tawny piliform scales in the males and white and iridescent black scales with white piliform scales in the females. Abdomens are taupe to tawny ventrally and chocolate dorsally. Forewing: Dorsal side chocolate to dark chocolate, a rust red to rust orange patch extending from the base to the subtermen, interrupted in the males by heavy androconial patches in chevron to rectangular patches between M3 and the inner margin. An ocelli sometimes appears as a small, round, black spot between M1-M2 and another similar ocellus occasionally appears between M2-M3. Ventral side taupe to chocolate with a ripple pattern in chocolate to dark chocolate striations extending along the costa and over the radials. A rust orange patch extends from the discal cell to the postmedian band, which is a lighter shade of orange and may be lightly bordered in chocolate. Apical ocellus extends from M1-M3 and is round, black, bipupillate, and ringed in daffodil yellow.

Hindwing: Dorsal side similar in color to the forewing with the postmedian band appearing between M2 and CuA2 in rust red to rust orange rectangular patches. Ventral side taupe to chocolate with a ripple pattern in chocolate to dark chocolate striations over the entire wing. Postmedian band is widest from the costa to M2 and lavender, narrowing abruptly at M2 and daffodil yellow from M2 to the inner margin, the median border either smoothly sinuous or barely scalloped. Ocelli are present in each cell from Rs to 1A+2A and are small, round,

and white or daffodil yellow. Some of these may be obscured by the ripple pattern or absent.

Distribution: Similar in range to *Q. monachus monachus*, but found in small, isolated populations within this range where *Q. monachus limonias* have been collected exclusive of the nominate subspecies.

Specimens examined: Chile, Santiago Metropolitan province, (OSU) 000093362, (MTSU) CH43-1; Chile, Maule province, (OSU) 000094365, 000095046, 000095051, 000094365, (MTSU) CH26-3; Chile, Bío-Bío province, (OSU) 000095048, (MTSU) CH32-3, CH32-4; Chile, unknown province, (BMNH) male Holotype 809782

*Neomaenas poliozona poliozona* (C. Felder & R. Felder, 1867) (*Epinephele*)

Type location: Valdivia, Los Ríos province, Chile

Holotype: (male) BMNH #809789

= *Satyrus valdivianus* Reed, 1877, nom. nud.

= *Satyrus thelxiope* Reed, 1877, nom. nud.

= *Satyrus chiloensis* Reed, 1877, nom. nud.

= *Neosatyrus reedii?* var. *fuscescens*, Butler, 1881

Type Location: La Union, Los Ríos province, Chile

Holotype: (male) BMNH #809619

Diagnosis: Most similar to *N. coenonympha*, but with the ventral side hindwing band in lavender instead of daffodil yellow and golden and the apical ocellus on the ventral side of the forewing having only a single pupil or none at all. Hindwing ocelli appear as small black spots between Rs-M1, M1-M2, CuA1-CuA2 and sometimes between CuA2-1A+2A.

Head: Antenna 7-9 mm, females with cream scales and males with dark chocolate brown scales, both terminating in a spatulate club. Eyes oval and sparsely hairy, length about 1.1 times width. Palps dark chocolate at the distal end, lightening to cream proximally. Piliform ventral side scales black and tan. Terminal palp segment oval and less than one fourth the length of the second segment.

Thorax of males nearly black, covered in iridescent black scales and long dark chocolate to medium brown piliform scales interspersed with similar cream scales. Female thorax slightly lighter than males and clothed with iridescent black scales interspersed with ivory. Long piliform scales medium brown to cream, but interspersed with black. Tarsus of the forelegs reduced to a single, clublike segment. Midlegs and hindlegs with four rows of amber spines on the tibia and tarsus.

Forewing: Wingspan 22-28mm. Termen nearly straight to slightly convex. Discal cell widely U-shaped at the distal end with the distance between M1-M2 slightly shorter than between M2-M3. Dorsal side medium to chocolate brown with fringe scales slightly lighter. Apical ocellus between M1-M2 appearing as a

small black spot on the dorsal side in both sexes. Females with a patch of rust red over the discal cell. Males with no visible androconial patch. Ventral side rust orange, widely bordered with warm medium brown, slightly lighter in the females with a postmedian band slightly lighter orange and barely visible. Apical ocellus between M1-M2 bordered in daffodil yellow and either with a single white pupil or, as in the type specimen, or none at all. A small black ocellus appears occasionally between M2-M3 and/or between CuA1-CuA2.

Hindwing: Wing shape trapezoidal. Termen slightly convex and barely scalloped between median veins and tornus, the inner margin excavated between anal vein and 1A+2A. Dorsal side medium to dark chocolate brown, darker toward the distal edges and slightly lighter in the females. Fringe scales slightly lighter. Long piliform scales appearing on both sexes at the base and over the discal cell, extending to the median. Females bearing red patches between M2-M3 and M3-CuA1. Ventral side dark chocolate brown closest to the thorax, fading to warm medium brown at the proximal edge of the postmedian band and darkening again between the distal edge of the postmedian band and the termen. Postmedian band in lavender, unevenly scalloped at the proximal border. Distal border slightly faded, but also unevenly scalloped. Small black ocelli between Rs-M1, M1-M2, CuA1-CuA2 and sometimes between CuA2-1A+2A.

Male genitalia: Uncus narrow and finger-like, approximately 1.3 times the length of the tegumen. Gnathos acute and  $\frac{3}{5}$  the length of the uncus,

pedunculus short and u-shaped at the terminus, and saccus U-shaped and shorter than the gnathos. Valvae widening distally past the median then narrowing to half the width, the distal end terminating in a U-shape. Aedeagus nearly even in width along the distal two-thirds, narrowing proximally to a blunt acute end.

Distribution: Can be found in Chile from the southwestern part of Bío-Bío province near Cañete, eastward toward the Andes and south to Los Lagos province near Volcán Osorno at 20-1200m above sea level from January to March.

Specimens examined: Chile, Bío-Bío province, (MTSU) CL0816; Chile, Araucanía province, (MTSU) CL0710-CL0720, CL0801-CL0809; Chile, Los Ríos province, (BMNH) Holotype male 809789, (MTSU) CH12-1; Chile, Los Lagos province, (OSU) 000093668, 000093671, 000093672, 000093678, (MTSU) CH10-5-CH10-7, CH10-9, CH10-1

*Neomaenas poliozona reedii* (Butler, 1881) (*Neosatyrus*) n. comb.

Type Location: Chile

Holotype: (male) BMNH Type No. Rh3872

Discussion: Previously regarded as a separate species in a separate genus from *N. poliozona poliozona* by the original author and by Weymer (1911) and synonymized by Ureta (1956) and Lamas and Vilorio (in Lamas, 2004), Herrera

(1966) places *reedii* in *Neomaenas* and notes its similarity to *poliozona* in genitalic features and differences in distribution, wing pattern, remarking that it may be a legitimate subspecies of *poliozona*.

Diagnosis: Identical to *N. poliozona poliozona*, but lacking the black spots on the ventral side of the hindwing, darker in color, and having a ripple pattern in dark chocolate striations over the hindwing.

Head: Palps with a longitudinal black stripe bordered dorsally with a cream to white stripe. Dorsal side piliform scales on the palps are black and scales on the ventral side are black and tan.

Forewing: Dorsal side chocolate to dark chocolate brown, females with a patch of rust orange that extends from the discal cell to subterminal band.

Postmedian band appears on the dorsal side of some males as a pair of rectangular patches between M3 and CuA2. Apical ocellus between M1-M3 appearing in some specimens as a round black spot. Ventral side similar in color to the dorsal side with a rust orange patch extending from the discal cell to the subterminal band, the postmedian band slightly lighter and bordered in dark chocolate. A ripple pattern with dark chocolate to dark coffee striations that extend along the costa and subterminal band.

Hindwing: Dorsal side similar in color to the forewing, postmedian band appearing in rust orange from M1 to the inner margin in females and rust red to rust orange in patches from M2 to CuA1 and from CuA2 to the inner margin. Postmedian band may not appear in darker specimens. Ventral side dark taupe

to warm medium brown with a ripple pattern appearing in dark chocolate to dark coffee over the entire wing. Postmedian band is a saturated lavender, edged on the median side in dark chocolate. Hindwing ocelli rarely appear as small, round, black spots between Rs-M1, M1-M2, or CuA1-CuA2.

Distribution: Can be found in Chile from the southwestern part of Bío-Bío province to Araucanía province at 50-200m above sea level from January to early March. Though the range of *N. poliozona reedii* is similar to that of *N. poliozona poliozona*, populations are allopatric. Ecological factors that separate these two subspecies are unknown and in need of further study.

Specimens examined: Chile, Araucanía province, (MTSU) CL0518-CL0521, CL0601-0627, CL0823-0829; Chile, unknown province (BMNH)  
Holotype male

*Neomaenas simplex* (Butler, 1881) (*Argyrophenga*)

Type location: near Termas de Chillán, Bío-Bío province, Chile

Holotype: BMNH Type No. Rh3878

Discussion: Thomas Edmonds remarks in Butler's original description that *simplex* is "scarce and difficult to catch" while Elwes (1903) notes that it resembles *Neosatyris ambiorix* in "form and flight," flying amongst low bushes. It can also be collected in the wooded spaces near Las Trancas, fewer than ten kilometers from Termas de Chillán.

Diagnosis: Similar to *N. inornata* in coloration and lack of design elements on the ventral side of the hindwing. Chocolate to dark chocolate brown with the ventral side more taupe to tawny, females being generally lighter in coloration than the males. Veins highlighted in ivory to white distally past the median on the ventral side of the hindwing. Most obvious is the white triangular patch between M2-M3 adjacent to M3 with the apex touching the discal cell. Type specimen is without postmedian ocelli, but some specimens may have a single black ocellus ringed in yellow between CuA1-CuA2 and others may also bear small black or ivory ocelli between M2-M3 and/or M3-CuA1.

Head: Antennae 7-9mm and covered in cream and ivory scales on the dorsal side, terminating in a spatulate club. Eyes oval and naked, length approximately 1.4 times width. Palps with a longitudinal black stripe along the median with piliform ventral side and dorsal side scales black, tan, and ivory. Terminal palp segment cylindrical and about one fifth the length of the second segment.

Thorax dark sepia and clothed with iridescent black scales. Piliform scales ivory to medium brown, the males slightly darker. Abdomen ivory and tan. Forelegs of both males and females with the tarsus cylindrical and club-like. Midlegs and hindlegs with four rows of amber spines on the tibia and tarsus.

Forewing: Wingspan 24-30mm. Termen slightly convex and the distal end of the discal cell widely V-shaped with the distance between M1-M2 shorter than between M2-M3. Dorsal side chocolate to dark chocolate brown with tan fringe

scales. Small rust-red patches appearing faintly over the discal cell in the females. Apical ocellus between M1-M2 appearing either as a faint black spot or absent in males or as a black spot or distinct ocellus ringed in taupe and bronze in females, sometimes paired with another similar ocellus between M2-M3. Males with no visible androconial patch. Ventral side rust orange and widely bordered in taupe to chocolate brown that fades to maize brown at the apex over the radials. Postmedian band yellow-orange proximally and taupe to chocolate brown distally and bordered by a faint medium to dark chocolate brown outline. Apical ocellus between M1-M3 ringed in daffodil yellow and bipupillate, one white pupil in each cell, and extending just past the confines of the cells. Another black, sometimes unipupillate ocellus appears occasionally between M3-CuA1 and may be fused with the M1-M3 ocellus.

Hindwing: Wing trapezoidal, termen slightly convex and barely scalloped. Inner margin barely excavated between anal vein and 1A+2A. Dorsal side chocolate to dark chocolate brown with tan fringe scales. Females sometimes with rust red patches between M3-CuA1 and CuA1-CuA2 on the dorsal side. Long piliform scales appearing on both sexes at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side taupe to tawny with a patch of black and tawny scales at the base. Veins highlighted in ivory to white distally past the median. A white triangular patch appears just distal to the discal cell sits between M2-M3, adjacent to M3 with its apex touching the discal cell. A single black postmedian ocellus ringed in taupe to daffodil yellow is

found between CuA1-CuA2 in some specimens and a small ocelli occasionally appears between M2-M3 and/or M3-CuA1 and may be ivory or black ringed with yellow. Type specimen is without hindwing ocelli.

Male genitalia: Uncus narrow and finger-like, widening very slightly at the median, approximately 1.3 times the length of the tegumen. Gnathos acute and a little more than half the length of the uncus, pedunculus long and U-shaped, and saccus U-shaped and about as long as the gnathos. Valvae widening distally past the median then narrowing to half the width, the distal end terminating in a U-shape. Aedeagus nearly even in width along the distal two-thirds, narrowing proximally to an acute end.

Distribution: Can be found in Chile from the eastern part of Bío-Bío province southward to northern Araucanía province in January and February at 1000-1550m above sea level. Abundant near Termas de Chillán.

Specimens examined: Chile, Bío-Bío province, (BMNH) Holotype No. Rh3878, (MTSU) CH24B-10, CL0204, CL0205, CL0309-CL0311, CL0317, CL0419-CL0422, (CU) 2 specimens

*Neomaenas tristis* (Guerín-Ménéville, [1830]) (*Argynnis*) n.comb.

Type location: Chile

Type: no type

= *Satyrus flora* Philippi, 1859

Type location: Corral, Los Ríos province, Chile

Type: no type

= *Pedaliodes oaxes* Butler, 1870

Type location: "Cuba," probably Valdivia, Los Ríos province, Chile

Holotype: (male) BMNH #809742 (specimen examined)

= *Stibomorpha reedii* Butler, 1874 repl. name

Type location: Chile

Syntype: (male) MNHN, Paris (photo examined)

Discussion: There is some confusion throughout the literature as to whether *N. tristis* is synonymous with or a form of *A. coctei*, many agreeing that the original figure, which depicts only the dorsal side, is barely adequate to distinguish it as a separate species (Butler, 1868; Elwes, 1903; Weymer, 1911; Hayward, 1958; Herrera, 1966). Hayward places it in its own genus, *Spinantenna*, based primarily on wing venation, but it is similar enough to other members of *Neomaenas* to be placed there.

Diagnosis: Most similar to *Auca coctei*, but larger, without androconia in the males, and bearing a distinctive white to yellow triangle on the ventral side of the hindwing between M2-M3. Apical ocellus on the ventral side of the forewing appears as either a bipupillate dark chocolate or dark coffee spot between M1-M3 or as two smaller unipupillate dark chocolate or dark coffee spots between M1-M2 and M2-M3, fused at M2. Ocelli appear on the ventral side of the hindwing as a small yellow spot in each cell between Rs and 1A+2A, the ocelli

between Rs-M1, M1-M2, and CuA1-CuA2 ringed in dark chocolate. Females are lighter in color, the ventral side hindwing ocelli between M2-M3, M3-CuA1, and CuA2-1A+2A sometimes obscured. Hindwing is scalloped along the termen with a ripple pattern over the entire wing and the postmedian band on the ventral side deckle-edged and bordered in cream to daffodil yellow on the median side.

Head: Antennae 7-8mm, covered in dark chocolate scales with a white longitudinal stripe, and terminating in a spatulate club. Eyes naked and oval, length approximately 1.2 times the width. In the males, palps with a longitudinal white stripe bordered in black along the median, black and dark chocolate brown on the dorsal side, and white to cream with tawny and black piliform scales on the ventral side. Females with white palps, bearing a longitudinal tawny stripe at the median and black piliform scales on the ventral side. Terminal palp segment conical and slightly more than one-quarter the length of the second segment.

Thorax is dark amber with iridescent black scales and rust orange and black piliform scales in the males and with white and iridescent scales and cream to tawny piliform scales in the females. Male abdomens are dark chocolate brown ventrally and dark coffee dorsally. Female abdomens are cream to taupe ventrally and dark chocolate dorsally. Forelegs of both sexes with tarsi unsegmented and clublike. Midlegs and hindlegs with four rows of dark amber spines on the tibia and tarsus.

Forewing: Wingspan 24-30mm. Termen slightly concave and the distal end of the discal cell widely V-shaped. Males without visible androconia. Dorsal

side dark chocolate in the males with a small patch of rust red at the median from M1 to M3 and chocolate in the females with a rust orange to rust red patch at the median between M1 and M3 and between CuA1-CuA2, the ocellus between M1-M3 barely visible in the females. Fringe scales are white or daffodil yellow and dark chocolate in stripes perpendicular to the termen, giving the appearance of crenulation. Ventral side dark chocolate in the males with a ripple pattern in daffodil yellow and dark coffee along the costa and over the radials and in dark coffee and dark chocolate along the subterminal band. A patch of rust red extends from the base to the median. Postmedian band is rust red to rust orange and outlined in dark coffee, deckle-edged at both the median and subterminal borders. Ocellus between M1-M3 round, dark coffee to black, and bipupillate, sometimes appearing as two separate unipupillate ocelli. Females are similar to the males, but lighter in color.

Hindwing: Wing trapezoidal, termen convex and scalloped. Inner margin excavated between anal vein and 1A+2A. Dorsal side similar in color to the forewing, females with a patch of rust red to rust orange over the postmedian band from M2 to CuA1. Fringe scales are as in the forewing. Ventral side with a ripple pattern in daffodil yellow with dark chocolate to dark coffee striations along the costa. Subbasal band white to daffodil yellow with dark coffee striations in the males and white to cream with dark chocolate striations in the females, the submedian border deckle-edged. Submedian band is dark chocolate with dark coffee striations in the males, fading to daffodil yellow with dark coffee striations

toward the inner margin. Females are chocolate to cream with dark chocolate striations at the submedian band. Postmedian band is edged in cream to yellow at the median border in both sexes, a white to daffodil yellow triangle appearing between M2-M3. Center of the postmedian band is chocolate brown with dark chocolate striations in the males and cream to daffodil yellow with chocolate to dark chocolate striations in the females. Subterminal border of the postmedian band is scalloped and the subterminal band is similar in coloration to the submedian band. Hindwing ocelli appear as a small yellow spot appears in each cell between Rs and 1A+2A, the ocelli between M2-M3, M3-CuA1, and CuA1-CuA2 ringed in dark chocolate brown. Ocelli between M2-M3, M3-CuA1, and CuA2-1A+2A may be obscured in females.

Male genitalia: Uncus widest at the base, narrowing toward a finger-like distal end and approximately 1.4 times longer than the tegumen. Gnathos acute and a little more than half the length of the uncus. Pedunculus long and U-shaped. Saccus U-shaped and a little less than three-quarters the length of the gnathos. Valvae widest at the median, narrowing to an acute distal end. Aedeagus narrow, a little wider at the median, terminating in an acute proximal end, and bearing minute serrations toward the distal end.

Distribution: Can be found in Chile from southern Valparaiso province to northern Los Lagos province and in Argentina in the westernmost part of Rio Negro province from late November to mid-March at nearly sea level to 1200m above sea level.

Specimens examined: Chile, Bío-Bío province, (MTSU) CL0433, CL0901;  
 Chile, Araucanía province, (MGCL) 2 males; Chile, Los Ríos province, (BMNH)  
 Holotype male 809742; Chile, Los Lagos province, (OSU) 000093363,  
 000093364, (CU) 2 males; Chile, unknown province, (CU) 2 males

*Neomaenas wallengrenii* Butler, 1881

Type location: near Termas de Chillán, Chile

Lectotype: (male) BMNH #809361 (specimen examined)

Paralectotype: (female) BMNH #809362 (specimen examined)

= *Neomaenas ljugnerae* Bryk, 1944

Type location: Lago Nahuel Huapí, Río Negro province, Argentina

Holotype: (male) NRM, Stockholm (photo examined)

Discussion: Two specimens, a male and a female, are marked as the type for *N. wallengrenii* and I have designated the male as the lectotype. This species is very abundant near Termas de Chillán in the last half of February, especially in clearings with flowers near wooded areas where *Chusquea* is abundant, which agrees with the original description. Hayward (1958) found it in southwest Neuquén province, Argentina.

Diagnosis: Dorsal side chocolate to dark chocolate brown with the forewing apical ocellus between M1 and M2 appearing as a black spot that is rarely pupillated. Discal cell of the ventral side hindwing maize yellow and the

postmedian band daffodil yellow at the proximal edge as in *N. coenonympha*, but very wide toward the costa and constricted at CuA1. A black ocellus between CuA1 and CuA2 as in *N. coenonympha*, but usually larger and more oval than round. Cubitus, M3, cubital veins, and anal veins white.

Head: Antennae 7-9mm and sparsely clothed in cream and chocolate scales on the dorsal side, terminating in a spatulate club. Male antennae tend to bear more of the darker scales than female. Eyes oval and sparsely hairy, length approximately 1.3 times the width. Palps white to cream, the piliform ventral side scales white, black, and tan. Terminal palp segment slender, cylindrical, and a little more than one-fourth the length of the second segment.

Thorax black, females covered in white to ivory scales and males with cream to bronze scales. Scales of the abdomen cream to dark chocolate brown, darker in the males than the females. Male foreleg tarsus club-like and completely fused, but with a single unarticulated pseudo-segment visible at about the midpoint. Female tarsus longer and more slender than the male with four pseudo-segments visible at the distal end. Midlegs and hindlegs with four rows of amber spines on the tibia and tarsus.

Forewing: Wingspan 25-30mm. Termen nearly straight or barely convex. Discal cell widely V-shaped at the distal end with the distance between M1-M2 slightly shorter than between M2-M3. Dorsal side chocolate to dark chocolate brown with fringe scales medium brown to tan. Postmedian band appearing faintly in rust red or dark brown on lighter-colored specimens, most often in the

females. Apical ocellus between M1-M2 appearing as a black spot on the dorsal side in both sexes, but more strongly and occasionally bearing a single ocellus in the females. Males with no visible androconial patch. Ventral side rust-orange and widely bordered in chocolate brown to tan that fades into golden to daffodil yellow at the radials. Postmedian band yellow-orange to medium orange, yellower toward the costa, and with a thin brown border that is constricted between M3 and CuA1, sometimes completely. Apical ocellus between M1-M2 ringed in daffodil yellow most often with a single white pupil, but occasionally, as in the female allotype, bipupillate.

Hindwing: Wing almost rectangular, termen slightly convex, barely scalloped, almost entire, between median veins and tornus and inner margin excavated between the anal vein and 1A+2A. Dorsal side chocolate to dark chocolate brown with fringe scales medium brown to tan. Postmedian band appearing faintly in rust red or dark brown on lighter specimens and not at all in darker specimens, usually males. Long piliform scales appearing on both sexes at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side chocolate brown to medium brown, greyish toward the base with a ripple pattern at the inner margin. Discal cell and stripe between CuA2 and 1A+2A maize yellow. Postmedian band very wide at the costa, the proximal edge extending past the median and then narrowing sharply toward the termen, constricted completely or to a few millimeters at CuA1, widening again sharply between CuA1 and CuA2, continuing in an S-curve, and terminating at

1A+2A. Proximal edge of the postmedian band daffodil yellow, fading to base color and then maize yellow toward the distal edge. A black, oval, unpupillated ocellus ringed in yellow between CuA1 and CuA2. Sometimes, a similar but smaller ocellus appears between M1 and M2, as in the female allotype. Terminal band white toward the apex, fading to brown at the tornus. Cubitus, M3, cubital veins, and anal veins highlighted in white.

Male genitalia: Uncus narrow and finger-like, approximately 1.2 times the length of the tegumen. Gnathos acute and half the length of the uncus, pedunculus short and acute, and saccus U-shaped and longer than the gnathos. Valvae wide, narrowing gradually from the median to a U-shaped distal end. Aedeagus nearly even in width along the distal two-thirds, narrowing proximally to half the width at a truncate end.

Distribution: Can be found in Chile from the southwestern part of Santiago Metropolitan province southward to Araucanía province from January to March at 700-1830m above sea level.

Specimens examined: Chile, Maule province, (MTSU) CH18-1; Chile, Bío-Bío province, (OSU) 000093663, 000093670, 000093675, (MTSU) CH24-6, CH24B-09, CH24B-11, CL0206-CL0213, CL0318-CL0345, CL0405-0416, CL0501, CL0907, (BMNH) Lectotype male 809631; Chile, Araucanía province, (MTSU) CH40-1; Chile, unknown province, (BMNH) Paralectotype female 809632

*Neomaenas servilia* Wallengren, 1858

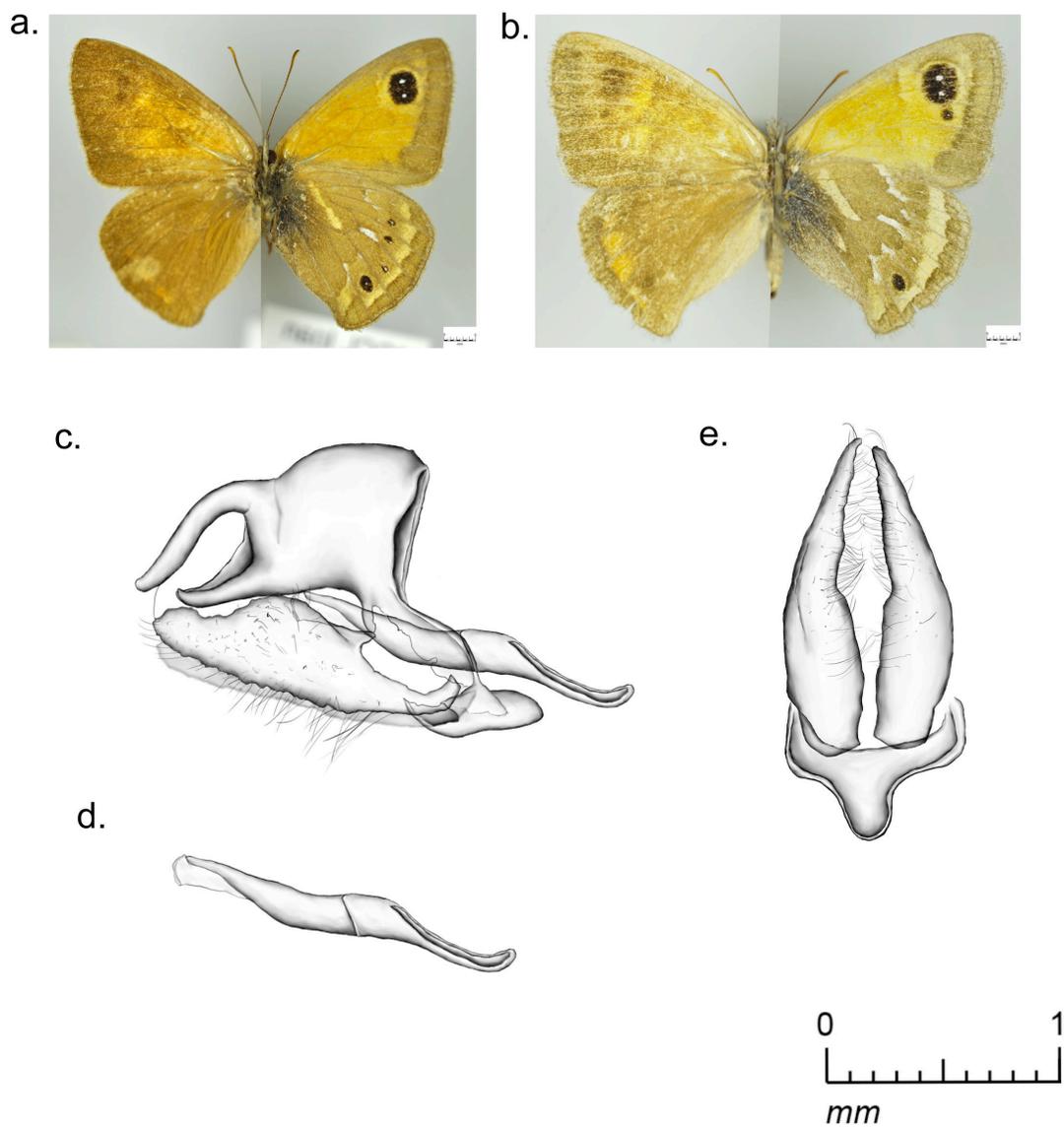


Figure 5-1. (a) Male dorsal (left) and ventral (right), (b) female dorsal (left) and ventral (right), and (c-e) male genitalia from the CU collection

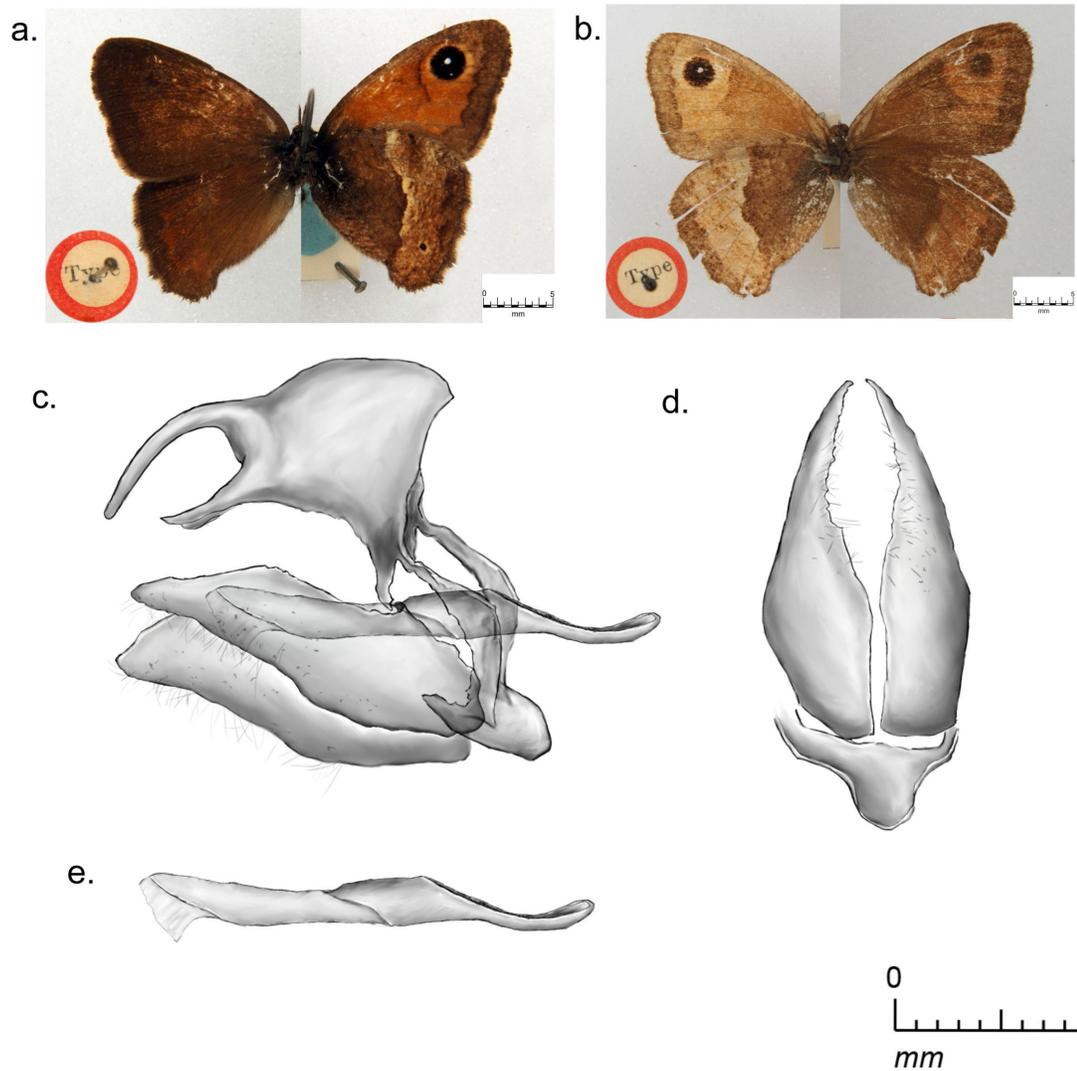
*Neomaenas coenonympha* Butler, 1881

Figure 5-2. (a) Male lectotype dorsal (left) and ventral (right) BMNH#809622, (b) female paralectotype dorsal (left) and ventral (right) BMNH#809623, and (c-e) male genitalia CH26-1

*Neomaenas edmondsii* (Butler, 1881)(*Argyrophenga*)

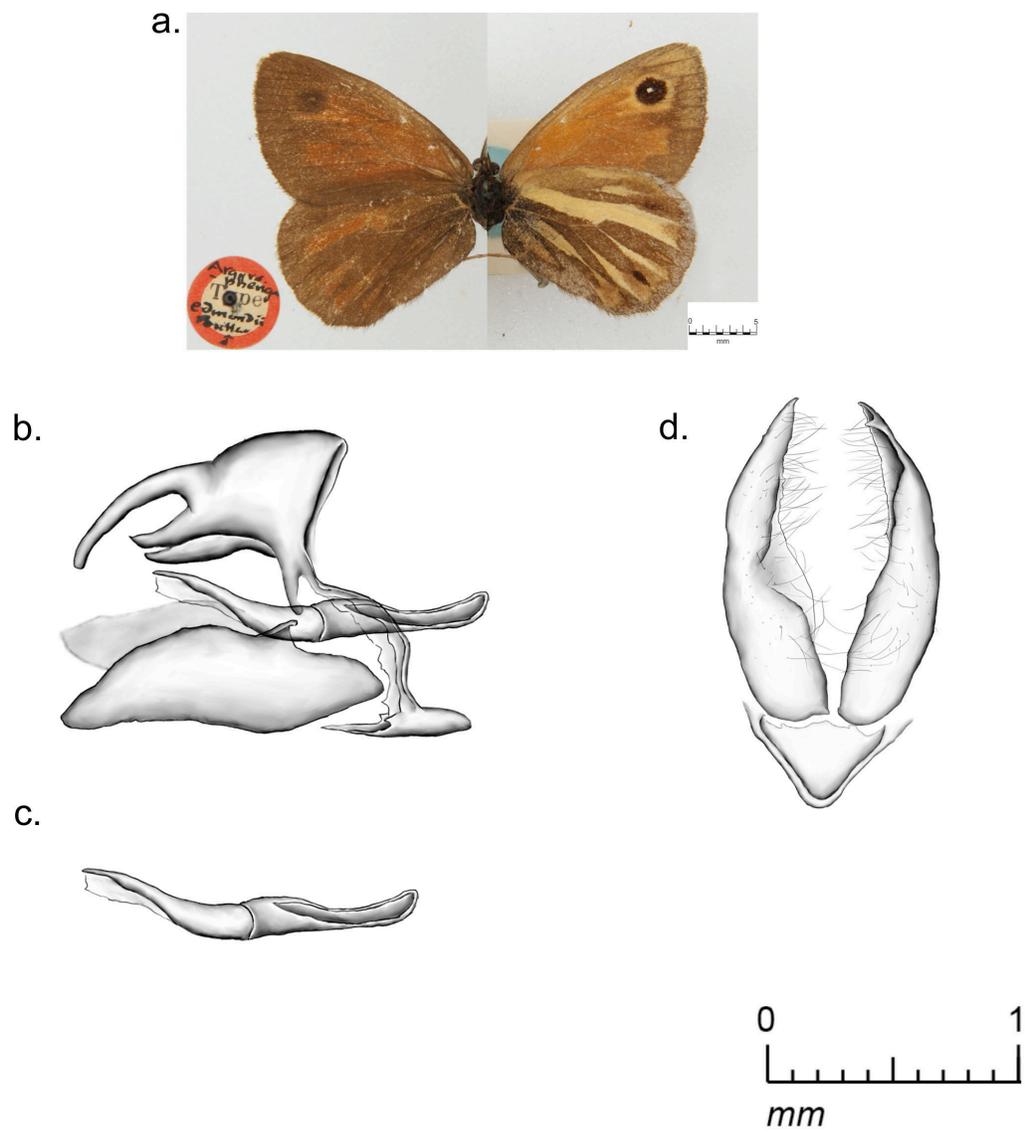


Figure 5-3 (a) Male holotype dorsal (left) and ventral (right) and (b-d) male genitalia CL0701

*Neomaenas fractifascia* Butler, 1881

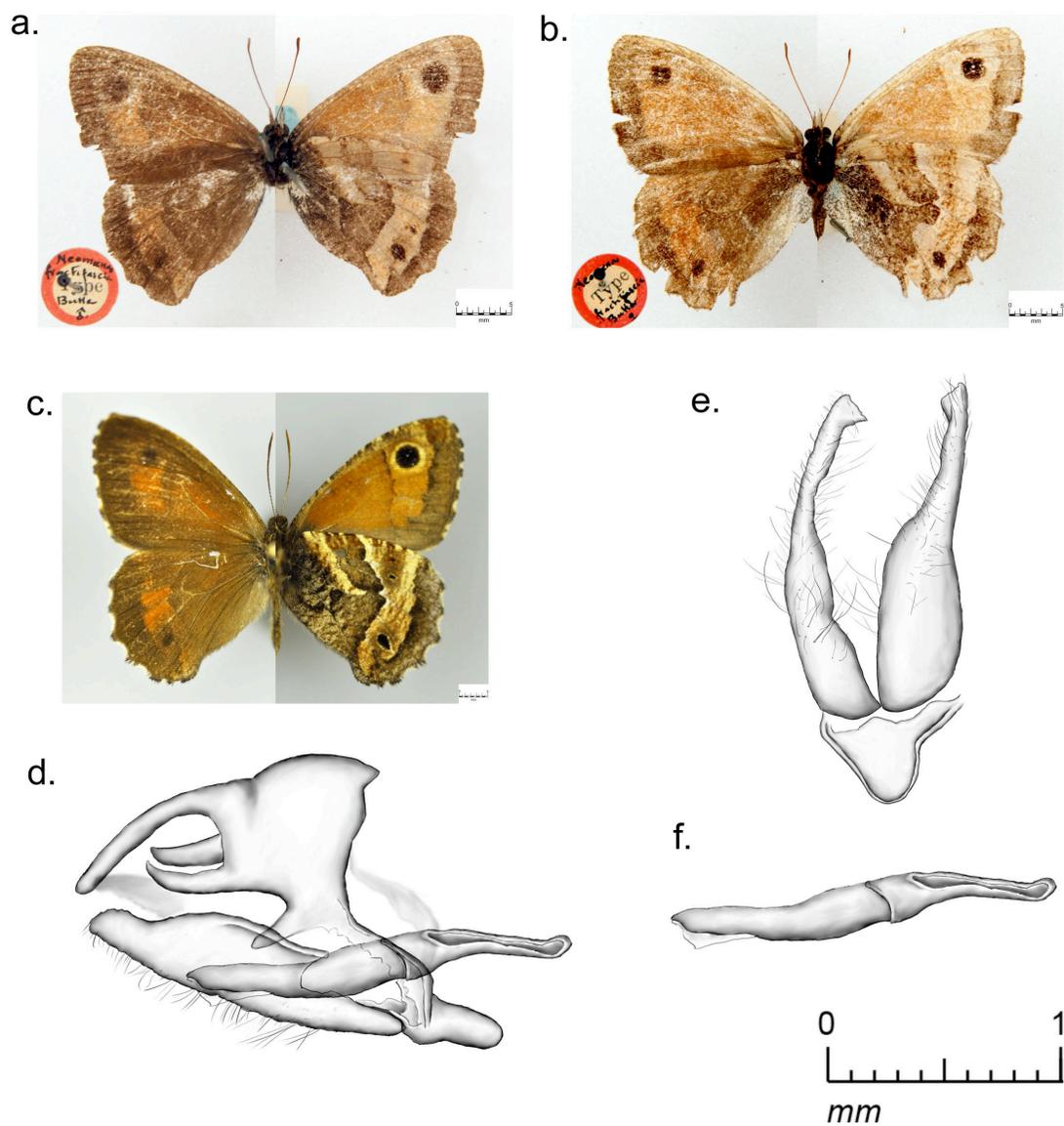


Figure 5-4. (a) Male lectotype dorsal (left) and ventral (right) BMNH#809629, (b) female paralectotype dorsal (left) and ventral (right) BMNH#809628, (c) male specimen showing dorsal (left) and ventral (right) patterning of a fresh specimen OSU#93666, and (d-f) male genitalia CH25-3

*Neomaenas monachus* (Blanchard, 1852) (*Satyrus*) n. comb.

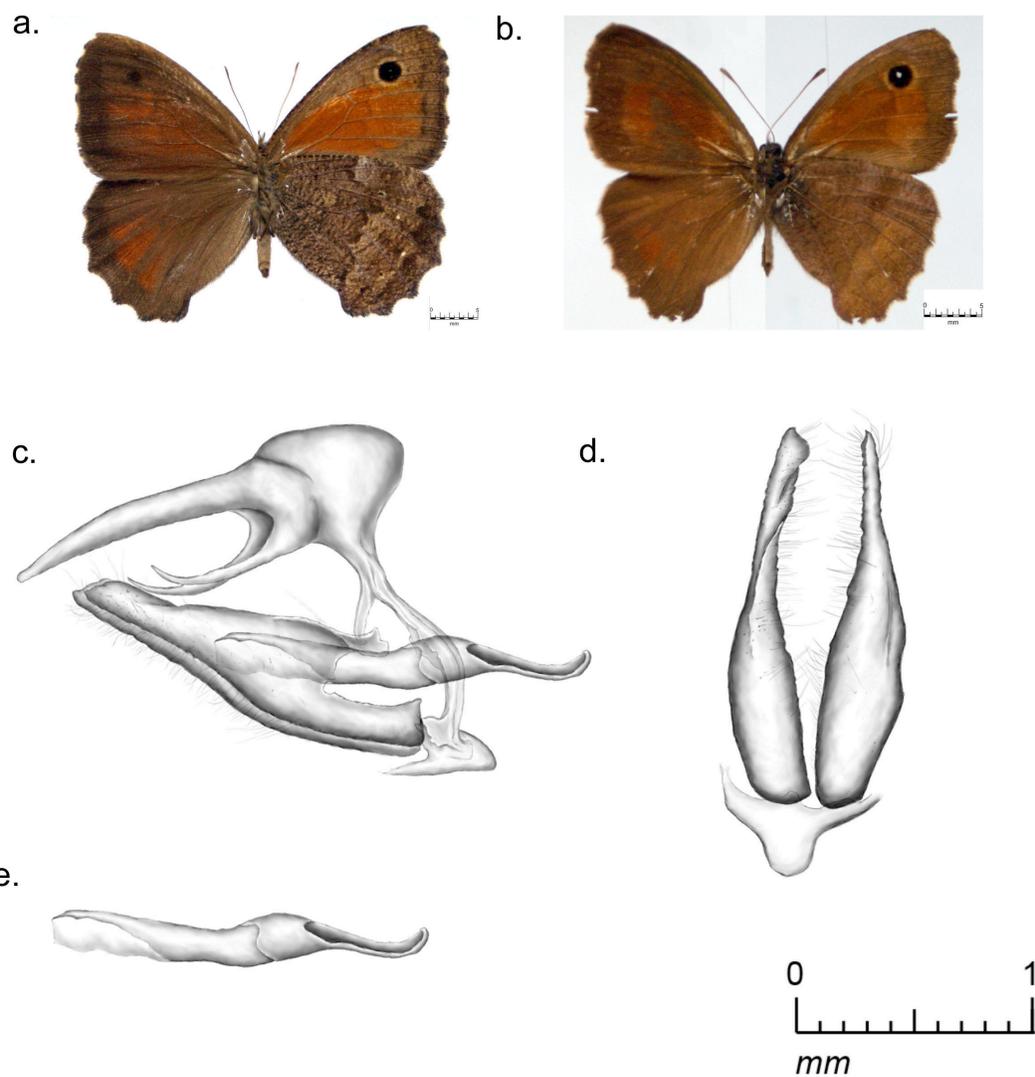


Figure 5-5. (a) Male *N. monachus monachus* dorsal (left) and ventral (right) and (b) male *N. monachus limonias* dorsal (left) and ventral (right) from the UJ collection. (c-e) Male genitalia CH32-3

*Neomaenas poliozona* (C. Felder & R. Felder, 1867) (*Epinephele*)

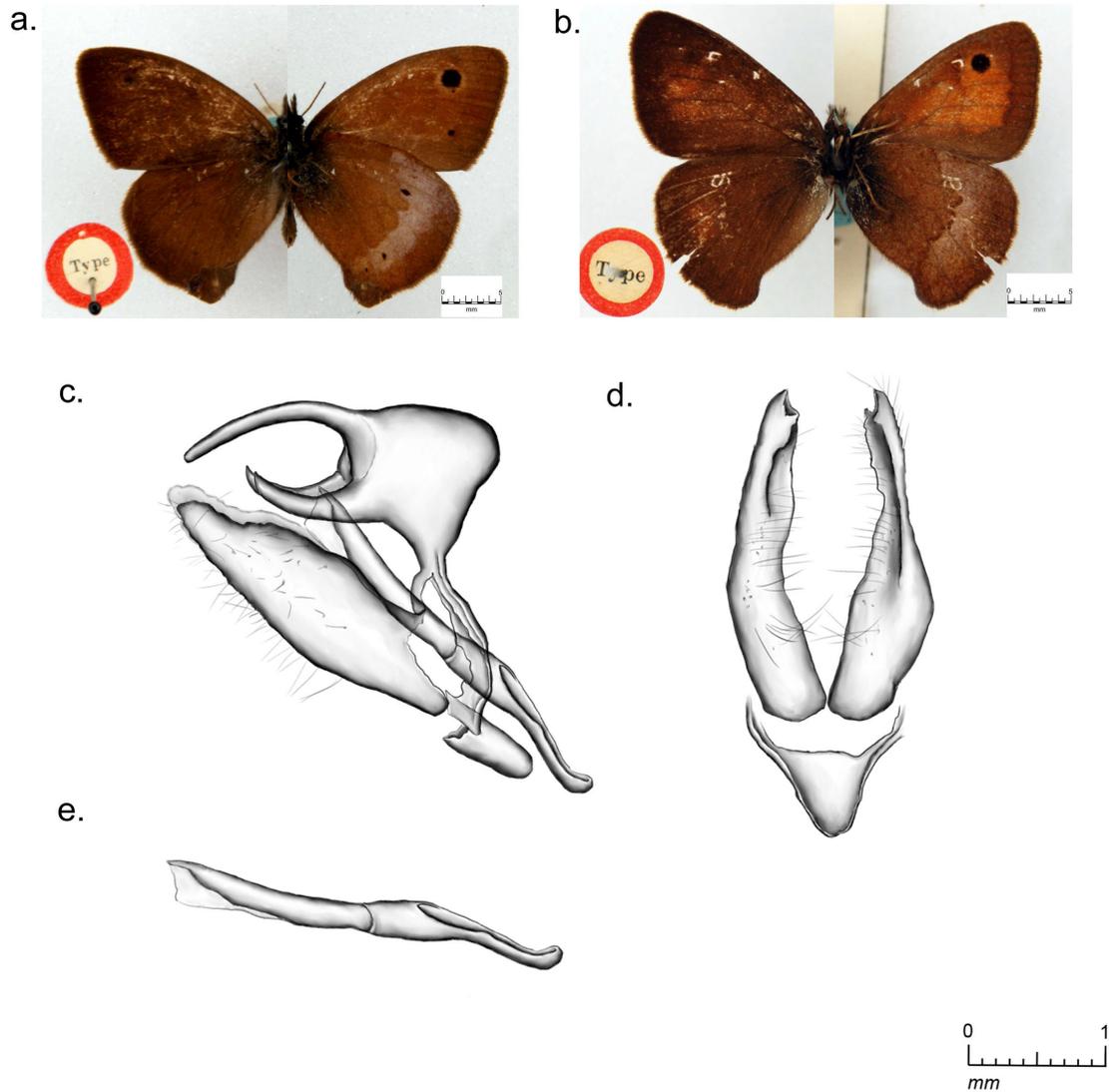


Figure 5-6. (a) Male holotype *N. poliozona poliozona* dorsal (left) and ventral (right) BMNH#809789, (b) Male holotype *N. poliozona reedii* dorsal (left) and ventral (right) BMNH#809619, and (c-e) male genitalia CH10-5

*Neomaenas simplex* (Butler, 1881)(*Argyrophenga*)

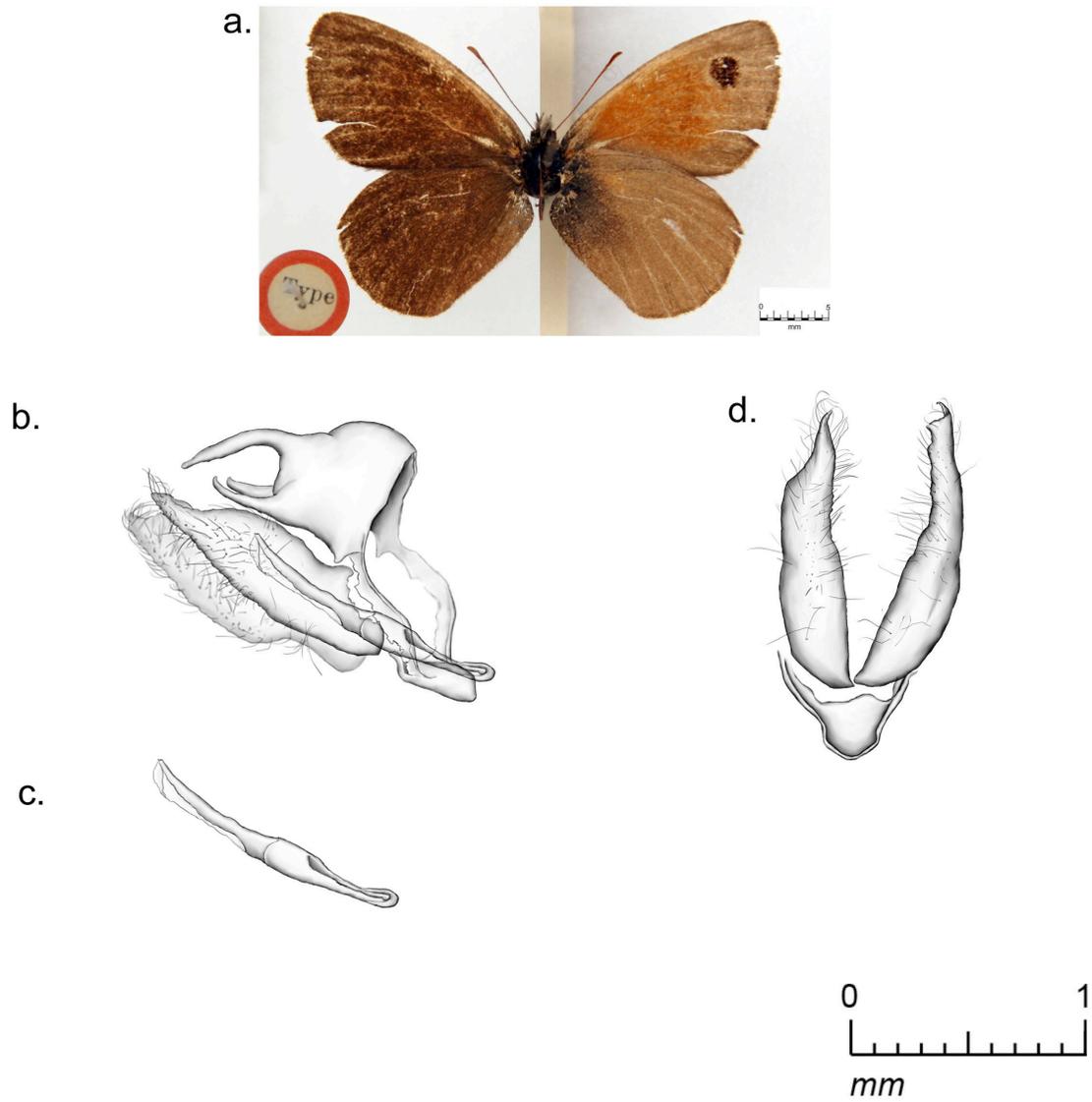


Figure 5-7 (a) Male holotype dorsal (left) and ventral (right) BMNH#Rh3878, (b-d) male genitalia

CL0204

*Neomaenas tristis* (Guerin Méneville, [1830])(*Argynnis*) n. comb.

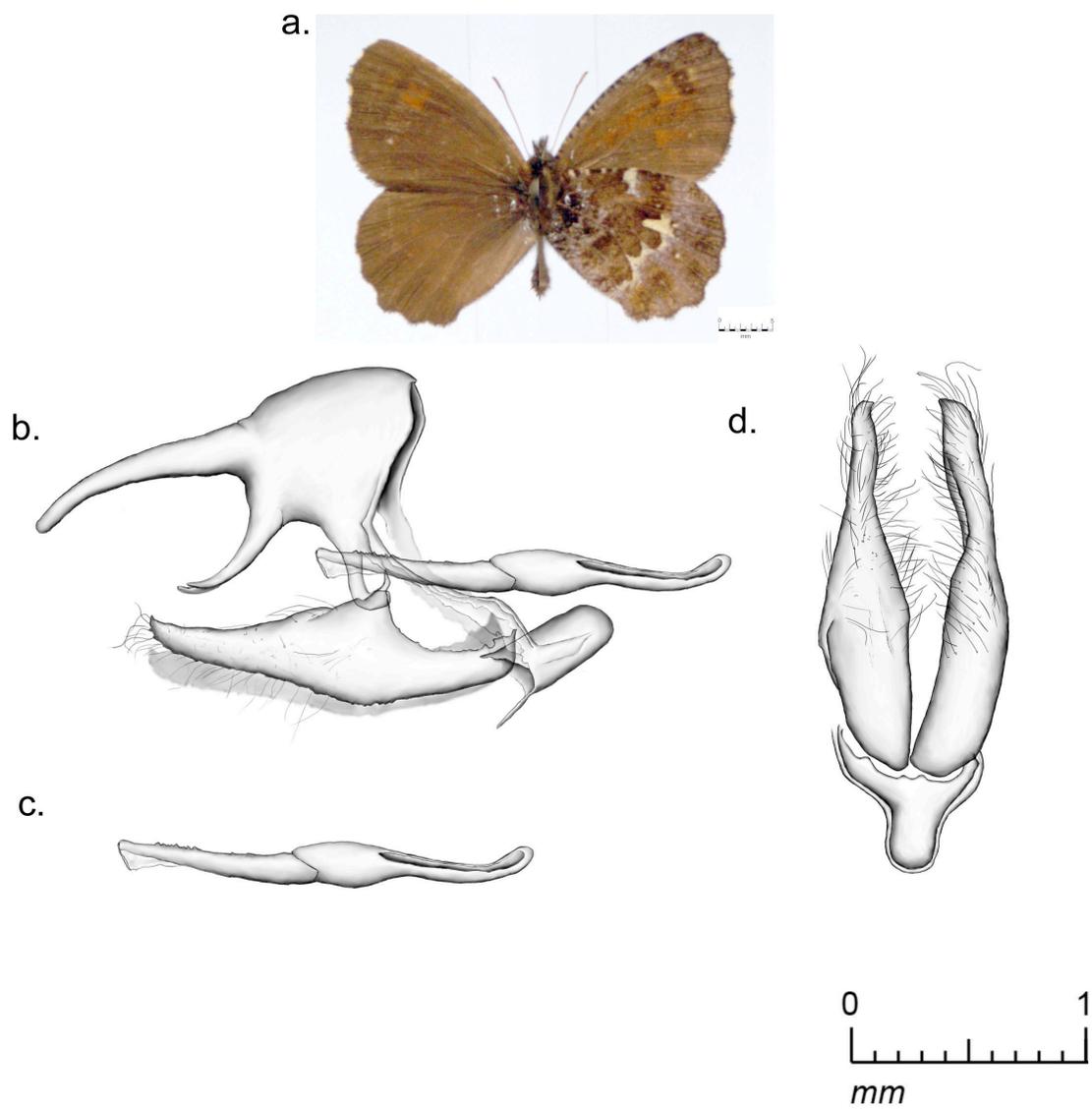


Figure 5-8 (a) Male dorsal (left) and ventral (right) from the UJ collection, (b-d) male genitalia CL0901

*Neomaenas wallengrenii* Butler, 1881

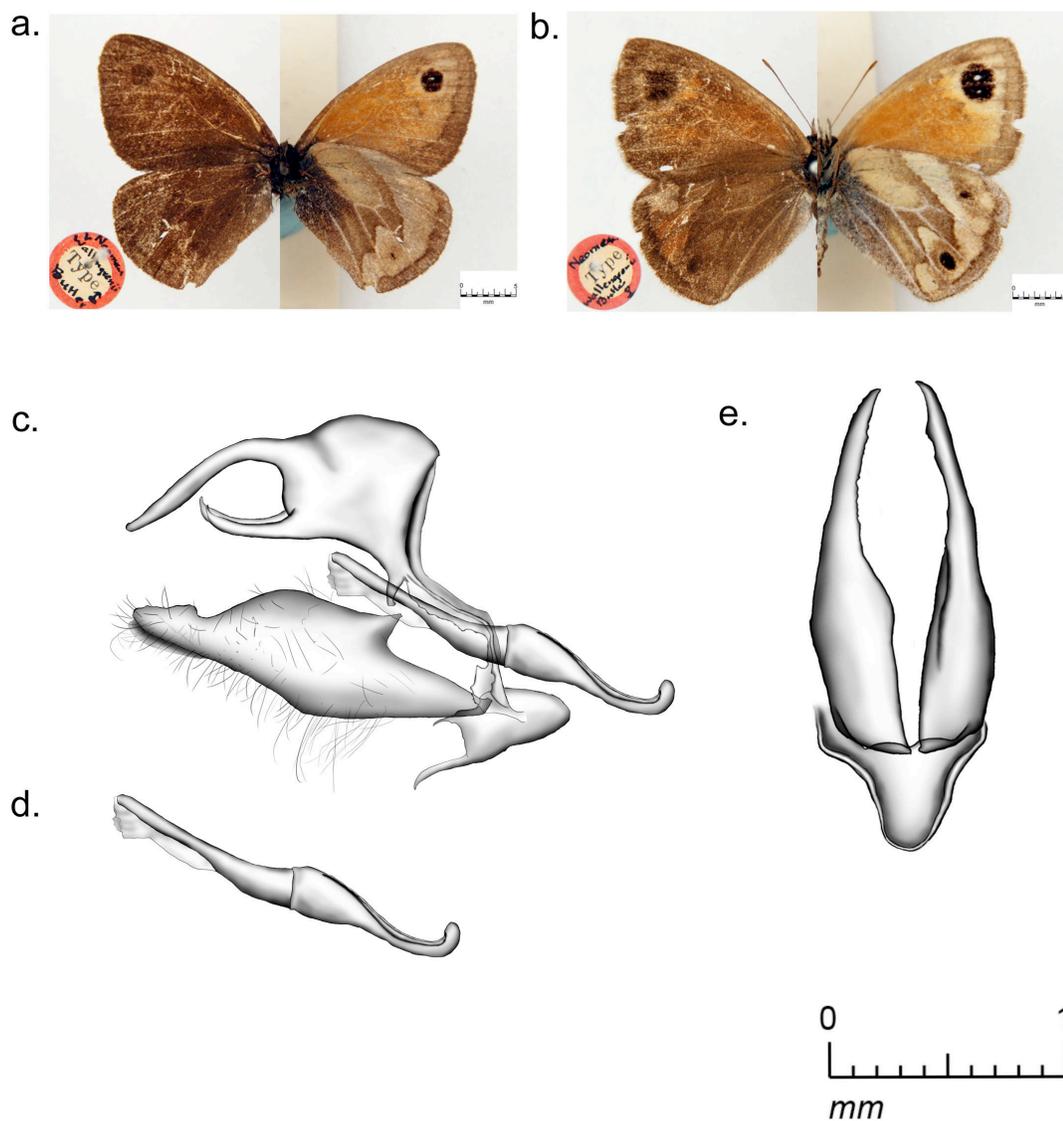


Figure 5-9. (a) Male lectotype dorsal (right) and ventral (left) BMNH#809361, (b) female paralectotype dorsal (right) and ventral (left) BMNH#809362, (c-e) male genitalia CL0204

*Punargentus* Heimlich, 1953

Type species: *P. lamna* (Thieme, 1904) (*Argyrophorus*)

= *Etcheverrius* Herrera, 1965 syn. nov.

= *Palmaris* Herrera, 1965 syn. nov.

Similar to *Argyrophorus* in hindwing patterning and silver coloration of *P. lamna*, *Punargentus* is closely related but nonetheless distinct. The original description states simply that this genus is more delicate and less colorful than *Argyrophorus* and *Cosmosatyrus*. *Etcheverrius* and *Palmaris* were described by Herrera (1965) based on minor differences in wing venation, foreleg segmentation, and genitalia are here added to *Punargentus*. This genus can be distinguished by the oval shape of the hindwings with the termen entire to scalloped with the ventral side bearing round to lenticular black ocelli in each cell bordered by or superimposed upon elongated yellow streaks. The ventral side of the hindwing has a ripple pattern over most of the wing with veins highlighted in white to grey. The ventral side of the forewing bears an unpupillated apical ocellus between M1-M2, sometimes extending to M3. Antennae are spatulate in *lamna* and *chiliensis*, round in *monticolens*. Males bear androconia in *monticolens* and *chiliensis*. Although I was unable to detect androconia in *lamna* males, Heimlich (1953) states that androconia are present. Eyes are naked and foreleg tarsi are unsegmented in the males with as many as three segments in the females. Male genitalia with the uncus widest at the median.

Several species were not available for more thorough study, but tend to fit this definition of *Punargentus* more closely than any other genus. *P. tandilensis* had been placed in *Etcheverrius*, *P. gustavi* and *P. penai* were previously placed in *Palmaris*, and *angusta* was originally in *Argyrophorus*, but was subsequently placed in *Punargentus*. Pyrcz and Wojtusiak (2010) included *Palmaris*, *Etcheverrius*, and *Punargentus* in their broader definition of *Argyrophorus*, but these species, like all others in this genus, bear an VFW ocellus that is unpupillated. Modolell et al. (2009) make a compelling argument that, based on similarities in male genitalic features and wing patterning, *P. gustavi* and *P. penai* are closely related, if not conspecific. Given this evidence, it is clear that *penai* is a subspecies of *gustavi*, particularly given the biogeographical separation. *Punargentus angusta* and *P. gustavi penai* are silver on the dorsal wings as in *Argyrophorus*, but this feature is not exclusive to *Argyrophorus* and can be seen in *P. lamna*. For each of these species, VHW wing patterning is similar to that of *P. monticolens*, with little variation.

*Punargentus lamna* (Thieme, 1904) (*Argyrophorus*)

Type location: Bolivia

Holotype: (male) MFN, Berlin? (not examined)

Diagnosis: Somewhat resembles *Argyrophorus argenteus*, but with the silver dorsal side of the forewings bordered in chocolate to dark chocolate brown and with the hindwings entirely brown. Wings lack silver on the ventral side and

forewings lack the red patch over the discal cell. Ventral side more closely resembles *A. blanchardi*, but without white scales on the hindwing and with an unpupillated ocellus in between M1-M2 and M2-M3 instead of a single unipupillate ocellus that spans both cells. Antennae of *P. lamna* terminate in a spatulate club and males are without androconia. Male genitalia somewhat resemble that of *A. blanchardi*, but with the distal end of the valvae more triangular and the uncus shorter.

Head: Antennae 9-11mm, the proximal half white with chocolate scales at the joints and the distal half chocolate brown with a longitudinal stripe of white scales, and terminating in a spatulate club. Eyes oval and naked, length approximately 1.3 times the width. Palps almost entirely white with the terminal segment tan and the ventral side piliform scales in white, tan, and chocolate to dark chocolate. Terminal palp segment oval and about one-fourth the length of the second segment.

Thorax with dark coffee scales and piliform scales in white and chocolate to dark chocolate. Males with clublike unsegmented foreleg tarsi. Females unavailable for study. Midlegs and hindlegs with four rows of amber spines on the tibia and tarsus.

Forewing: Wingspan 26-32mm. Termen slightly convex and the distal end of the discal cell widely U-shaped. Males without visible androconia. Fringe scales in chocolate brown. Dorsal side silver bordered in chocolate to dark chocolate brown along the termen. Ventral side chocolate to dark chocolate

brown with a patch of white at the apex along the costa and over the radials. A ripple pattern appears in dark coffee striations along the costa and subterminal band, sometimes sparsely over the entire wing. Postmedian band appears as a series of dark coffee chevrons in each cell along the postmedian and subterminal borders from the costa to M3, but may extend to the inner margin. A streak of daffodil yellow appears parallel to the veins between these chevrons in each cell between R5 and M3 and occasionally between M3-CuA1 and CuA1-CuA2. A round, black, unpupillated ocellus appears between M1-M2 and M2-M3, sometimes between R5-M1, and occasionally between M3-CuA1 and CuA1-CuA2.

Hindwing: Wing oval, termen convex and entire. Fringe scales are as in the forewing and long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Dorsal side chocolate to dark chocolate brown. Ventral side taupe to chocolate with a ripple pattern in dark chocolate to dark coffee over the entire wing. A dark chocolate to dark coffee scalloped line appears through the center of the discal cell. The postmedian band appears as a series of chevrons and dashes perpendicular to the veins in each cell between the costa and the inner margin. In each cell, these chevrons frame a white to daffodil yellow dash parallel to the veins and in each cell between Rs and CuA2, a small, black, unpupillated ocellus appears at the center of this dash. Termen is bordered in dark coffee to black and veins may be highlighted in white to grey.

Male genitalia: Uncus about the same length as the tegumen and widest at the median, narrowing gradually toward where it joins the tegumen to an acute distal end that hooks slightly toward the valvae. Gnathos wide, acute, and a little less than half the length of the uncus. Pedunculus long, narrower at the base than at the median, and terminating in a U-shape. Valvae widest at the median, narrowing gradually toward the distal end to a deltoid terminus and abruptly toward the proximal end to about two-fifths the width. Aedeagus nearly even in width throughout with a U-shaped terminus at the proximal end.

Distribution: Can be found in Peru from Ancash province southward along the Andes mountains into Huancayo and Cusco provinces from July to September, possibly as early as late May, and in Chile in eastern Antofagasta province in December at 2200 to 3900m above sea level. Type specimen is from an unspecified location in Bolivia.

Specimens examined: Peru, Junín province, (CU) 2 males

*Punargentus chiliensis chiliensis* (Guérin-Méneville, [1830]) (*Satyrus*) n.comb.

Type location: Concepción, Chile

Holotype: (female) MNHN, Paris (Photo examined)

*Punargentus chiliensis elwesi* (Bryk, 1944) (*Cosmosatyrus*) n. comb.

Type location: East of Lago Nahuel Huapí, Argentina

Holotype: (male) NRM, Stockholm (Photo examined)

*Punargentus chiliensis magallanicus* (Herrera, 1965) (*Etcheverrius*) n. comb.

Type location: Puerto Prat, Magallanes province, Chile

Paratype: (male) MNHN, Santiago de Chile (Photo examined)

*Punargentus chiliensis wygnankii* (Junge, 1987) (*Cosmosatyrus*) n. comb.

Type location: Apoquindo, Santiago Metropolitan province, Chile

Holotype: (female) ZSM (Photo examined)

Allotype: (male) ZSM

Paratypes: (23 males, 9 females) ZSM (Photo of a female examined)

Discussion: There is a high degree of regional variability in *P. chiliensis*, particularly in the coloration of the discal cell on the ventral side of the forewing. Each of the subspecies listed above mentions this as a primary character used in the differentiation between the subspecies and the nominal subspecies. This patch is red-orange in the nominal form, orange in *P. chiliensis elwesi*, peach-orange in *P. chiliensis wygnankii*, and a dull orange-brown in *P. chiliensis magallanicus*. Whether or not these bear out as good subspecies in a phylogenetic sense is unresolved here. *P. chiliensis wygnankii* can be found on grassy slopes near Santiago (Junge 1987). Bryk identifies *P. chiliensis elwesi* from illustrations provided in Elwes 1903, who notes that “It is possible that this

form may prove distinct from *chiliensis*.” Elwes notes that it can be found in grassy pampas east of Lago Nahuel Huapí in western Neuquén and Río Negro province, Argentina. Hayward (1958) curiously remarks that *P. chiliensis* can be found in Bolivia, though this is far north of the upper reaches of the distribution. Elwes also describes its flight as “a slow short flight among bushes,” contrasting it with the rapid straight flight of *P. monticolens*.

Diagnosis: Most similar to and sometimes confused with *Punargentus monticolens*, but with a spatulate antennal club and the yellow ring surrounding ocelli between Rs-M1 and M1-M2 reduced to a streak appearing just proximal and distal to the ocellus, but not circumscribing it. Dorsal side is chocolate to taupe in the females and dark chocolate in the males, which have patches of androconia inside the discal cell along the cubitus and between M2-M3, M3-CuA1, CuA1-CuA2, CuA2-1A+2A, and between 1A+2A and the inner margin. Ocellus between M1-M2 is unpupillated and surrounded by patches of pale yellow to light peach. Postmedian band on the ventral side of both forewing and hindwing is bordered on the distal side with a series of dark coffee chevrons. Hindwing bears dark coffee striations over all design elements and hindwing ocelli are flat lenticular black dashes between Rs-M1, M1-M2, and CuA1-CuA2 with adjacent yellow streaks just distal. Short, pale yellow streaks parallel to the veins appear between M2-M3 and M3-CuA1. Tarsus of both male and female forelegs is unsegmented and club-like and the aedeagus bears acute dentate projections along the distal one-third.

Head: Antennae 10-12 mm with white scales and a longitudinal stripe of taupe to coffee scales that covers half of a spatulate club. Eyes oval and naked, length approximately 1.3 times the width. Palps with a longitudinal chocolate stripe along the median with the dorsal side piliform scales white and chocolate and the ventral side white with dark chocolate piliform scales. Terminal palp segment cylindrical and about one-third the length of the second segment.

Thorax of the males dark amber with iridescent dark grey scales and covered in white and warm medium brown piliform scales. Females with the same coloration but with the addition of pearly white scales interspersed with the iridescent dark grey scales. Abdomen pearly white ventrally and taupe dorsally. Foreleg tarsi club-like and unsegmented, a little longer in the females. Midlegs and hindlegs with four rows of amber to dark amber spines on the tibia and tarsus.

Forewing: Wingspan 28-36mm. Termen nearly straight and the distal end of the discal cell widely V-shaped. Males with androconial patches inside the discal cell along the cubitus and between M2-M3, M3-CuA1, CuA1-CuA2, CuA2-1A+2A, and between 1A+2A and the inner margin, not extending beyond the median. Dorsal side dark chocolate in the males and chocolate to taupe in the females. Both sexes with an indistinct dark coffee to black ocellus between M1-M2, sometimes extending to M2-M3. Females with a patch of peach-brown to rust orange over the discal cell and a postmedian band that is a lighter brown than the wing streaked with patches of pale yellow that surround the apical

ocellus from R5-CuA1. Fringe scales in stripes of chocolate to dark chocolate and taupe to tan perpendicular to the termen. Ventral side with a ripple pattern along the costa and extending from the median to the termen. Area from the discal cell to the postmedian band may range from peach to orange to rust orange to rust red and is widely bordered at the inner margin in taupe to chocolate. Postmedian band is taupe to chocolate with an irregular proximal border of dark coffee and the distal border a series of dark coffee chevrons. Patches of pale yellow to light peach surround the apical ocellus, which is unpupillated and occupies the cell between M1-M2, sometimes extending beyond the confines of the cell. Apex is white at the costa and terminal sections of veins are highlighted in white.

Hindwing: Wing oval, termen slightly convex and scalloped. Dorsal side similar in color to the forewing with the distal edge of the postmedian band barely visible as a series of dark coffee chevrons. Fringe scales are as in the forewing and long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side chocolate to taupe with a ripple pattern superimposed over all design elements in dark chocolate to dark coffee striations. A thin, irregularly dentate, dark coffee band extends across the median, edged in grey to white along the proximal side. The proximal edge of the postmedian band irregularly dentate and bordered in dark coffee with a thin strip of white just distal to the proximal border. Distal border is a series of dark coffee chevrons with a patch of white just proximal to the border from the costa to M2

and just distal to the border along the terminal band from M2 to the tornus. Cells between Rs-M1, M1-M2, and CuA1-CuA2 bear a flat lenticular black ocellus with an adjacent pale yellow streak on the distal end. Cells between M2-M3 and M3-CuA1 contain a short streak of pale yellow. Ocellus between Rs-M1 may not be visible or reduced to a yellow streak similar to that between M2-M3 and M3-CuA1. Veins are highlighted in white.

Male genitalia: Uncus wide at the base, narrowing slightly, widest at the median, and narrowing to a finger-like terminus. Uncus approximately 1.4 times the length of the tegumen. Gnathos acute and approximately four-tenths the length of the uncus. Pedunculus long and nearly acute. Saccus truncate and about equal in length to the gnathos. Valvae narrow at the proximal end, widest at the median and narrowing slightly, but nearly even in width through the distal two-thirds with a deltoid terminus. Aedeagus nearly even in width throughout with a truncate proximal end and acute dentate projections along each lateral edge on the distal one-third.

Distribution: Can be found in Chile from central Coquimbo province to central Aisén province, possibly as far south as Punta Delgada in the northeastern part of the Strait of Magellan, and in Argentina from western Mendoza province to western Neuquén province, and to northeastern Rio Negro province from November to March at nearly sea level to 2800m above sea level.

Specimens examined: Chile, Valparaíso province, (MTSU) CH30-2, CH30-4, CH30-6; Chile, Santiago Metropolitan province, (ZSM) Holotype *P.*

*chiliensis wygnankii* male (photo examined), (MTSU) CH29-2-CH29-4, CH29A-1-CH29A-3, CH29A-5; Chile, Maule province, (OSU) 000094379, (MTSU) CH15-1-CH15-3, CH18-4, CH19-1-19-3; Chile Bío-Bío province, (MNHN, Paris) Holotype *P. chiliensis chiliensis* female (photo examined), (OSU) 000094369, 000094366, 000094376, (MTSU) CH2-1, CH32-2, CH37-1, CL0312, CL0423, (UJ) 2 males, 3 females; Chile, Araucanía province, (MTSU) CH40-3, CH40-4, (MGCL) 1 male; Chile, Magallanes province, (MNHN, Santiago de Chile) Paratype *P. chiliensis magallanicus* male (photo examined); Argentina, Mendoza province, (MTSU) JMC0810, (UJ) 4 males, 1 female; Argentina, Neuquén province, (MTSU) JMC0801; Argentina, Río Negro/Neuquén province, (NRM, Stockholm) Holotype *P. chiliensis elwesi* male (photo examined)

*Punargentus monticolens* (Butler, 1881) (*Hipparchia*) n. comb.

Type Location: Termas de Chillán, Chile

Holotype: (male) BMNH #809618 (Specimen examined)

= *Chionobas antarcticus* Mabilie, 1885 syn. nov.

Type Location: E. Patagonia

Holotype: (male) MNHN, Paris (photo examined)

Discussion: Weymer (1911) described *P. monticolens* as a form of *P. chiliensis*, but the two are distinct, albeit closely related species both morphologically and genetically. Originally placed in *Hipparchia* by Butler,

Weymer placed it, along with *P. chiliensis*, in the genus *Cosmosatyrus*. Herrera (1965) formed the genus *Palmaris* on the basis of autapomorphies such as slight differences in wing venation, male and female genitalic features, and foreleg segmentation. These differences are insufficient to place these similar species into separate genera. Elwes (1903) observed its flight as rapid and straight, “20 to 50 yards backwards and forwards over wet subalpine meadows always amongst grass and stones,” remarking that it was much harder to catch than the slower *P. chiliensis*. *Chionobas antarcticus* is synonymized with *P. monticolens* here on the basis that, while the wings of *antarcticus* are more narrow and elongated, there are no other significant differences in morphology.

Diagnosis: Most similar to and sometimes confused with *Punargentus chiliensis*, but having round antennal clubs and a yellow ring clearly circumscribing the ocelli between Rs-M1 and M1-M2. Dorsal side is warm medium brown to dark chocolate brown with the postmedian band sometimes appearing on the forewing as streaks or patches of maize yellow to rust orange and on the hindwing as teardrop-shaped patches of rust orange. Apical ocellus on the forewing appears as an indistinct dark coffee to black patch between M1-M2. Ventral side of the hindwing with dark chocolate to coffee striations superimposed over taupe to chocolate from the base to the proximal edge of the postmedian band and from the distal edge of the postmedian band to the termen. Postmedian band chocolate brown, bordered in light grey to white and edged in dark coffee to dark chocolate, narrower between M3-CuA1 than in *P. chiliensis*.

Females with two tarsal segments on the foreleg and male foreleg tarsi unsegmented. Males with an aedeagus lacking dentate lateral projections and terminating in an acute proximal end.

Head: Antennae 8-11 mm with white scales and a longitudinal stripe of chocolate brown that covers half of a round club. Eyes round and naked, length approximately 1.5 times the width. Palps with a longitudinal dark chocolate stripe along the median with the dorsal side scales white and the ventral side scales cream to tan with dark coffee piliform scales. Terminal palp segment conical and about one-seventh the length of the second segment.

Thorax of the males dark amber with iridescent black scales and covered in white to cream piliform scales. The thorax of females dark amber with white and iridescent black scales and covered in black and tan piliform scales.

Abdomen of both sexes cream to tan ventrally and tan to taupe dorsally. Foreleg tarsi of the females with two segments. Males with unsegmented tarsi that are shorter and stouter than that of the females. Midlegs and hindlegs with four rows of amber spines on the tibia and tarsus that project outward and nearly perpendicular to the leg.

Forewing: Wingspan 24-30mm. Termen nearly straight and the distal end of the discal cell sinuous, the costal end curved into a deep U-shape. Males with an androconial patch that extends across most of the discal cell and into each cell from M1 to CuA2, not extending past the median. Dorsal side warm medium brown to dark chocolate brown and with an apical ocellus between M1-M2

appearing as an indistinct dark coffee to black spot. Occasionally, another smaller indistinct black ocellus appears between M2-M3 and CuA1-CuA2. Cells between R5 and CuA2 may have rust orange to maize yellow patches that flank the ocellus or ocelli between M1-M3 and surround that between CuA1-CuA2. Ventral side with a central patch of rust orange to rust red that extends over most of the discal cell and to the median. Postmedian band may be little more than narrow patches of maize yellow that surround the unpupillated ocellus between M1-M3 and occupy each cell from the radials to the tornus to a distinct band of maize yellow that is widest at the radials, narrow between M3-CuA1, and slightly wider between CuA1-CuA2 where it terminates. Ripple pattern in taupe and dark chocolate appears along the costal border and fades to light grey and dark chocolate at the apex. Remainder of the wing is chocolate brown and terminal sections of veins may be highlighted in white.

Hindwing: Wing oval, the termen slightly convex and barely scalloped. Dorsal side similar in color to the forewing with the postmedian band appearing as a series of rust red to maize yellow teardrop-shaped patches. Fringe scales are as in the forewing and long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side with dark chocolate to coffee striations superimposed over taupe to chocolate from the base to the proximal edge of the postmedian band and from the distal edge of the postmedian band to the termen. Postmedian chocolate to taupe at the center, bordered in light grey to white and edged in dark chocolate to coffee.

Band is narrowest between M3-CuA1 and deckle-edged on both sides. A black lenticular unpupillated ocellus bordered in maize yellow appears in each cell along the postmedian band, with two ocelli sometimes appearing between CuA2-1A+2A and the ocellus between M3-CuA1 sometimes reduced to a short maize yellow dash parallel to the veins. Veins are highlighted in white.

Male genitalia: Uncus narrow at the base, widening at the median to three times the width of the base and narrowing to an acute end that hooks slightly downward. Uncus approximately 1.4 times the length of the tegumen. Gnathos acute and approximately half the length of the uncus. Pedunculus long and rounded at the terminus. Saccus truncate and less than three-fourths the length of the gnathos. Valvae with the proximal end about half the width of the median, narrowing only slightly toward the distal end with a blunt deltoid terminus. Aedeagus nearly even in width throughout, narrowing gradually to an acute proximal end.

Distribution: Found mainly in Bío Bío and Araucania provinces in Chile and in western Neuquén province, Argentina, but can be found as far north as Northern Mendoza province, Argentina, east to the Paraná Delta just north of the city of Buenos Aires, Argentina, and south to northeastern Aisén province, Chile, and to central Santa Cruz province, Argentina, along the western border. Flies from November to February at nearly sea level to 3300m above sea level.

Specimens examined: Chile, Bío-Bío province, (BMNH) Holotype 809618, (MTSU) CH24A-3, CH24A-5, (MGCL) 1 male; Argentina, Mendoza province,

(MTSU) JMC0811, (UJ) 1 male; Argentina, Neuquén province (MTSU) JMC1002,  
(UJ) 7 males, 2 females; Argentina, Santa Cruz province (UJ) 1 male, 1 female

*Punargentus lamna* (Thieme, 1904)(*Argyrophorus*)

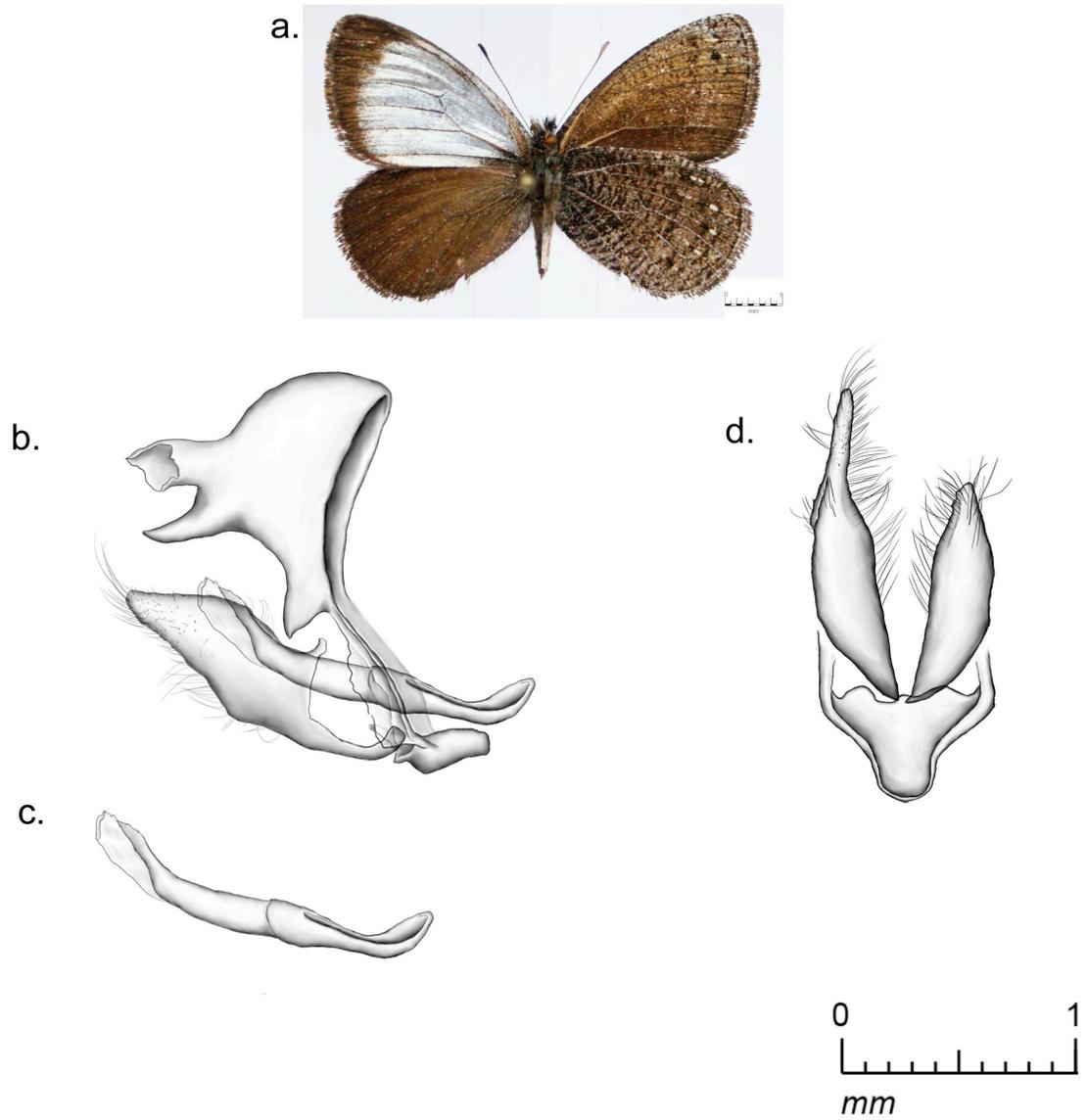


Figure 3-1. Male dorsal (left) and ventral (right) from the UJ collection and (b-d) male genitalia from the CU collection (b) uncus and (d) right valva damaged

*Punargentus chiliensis chiliensis* (Guérin-Ménéville, [1830])(*Satyrus*) n.comb.

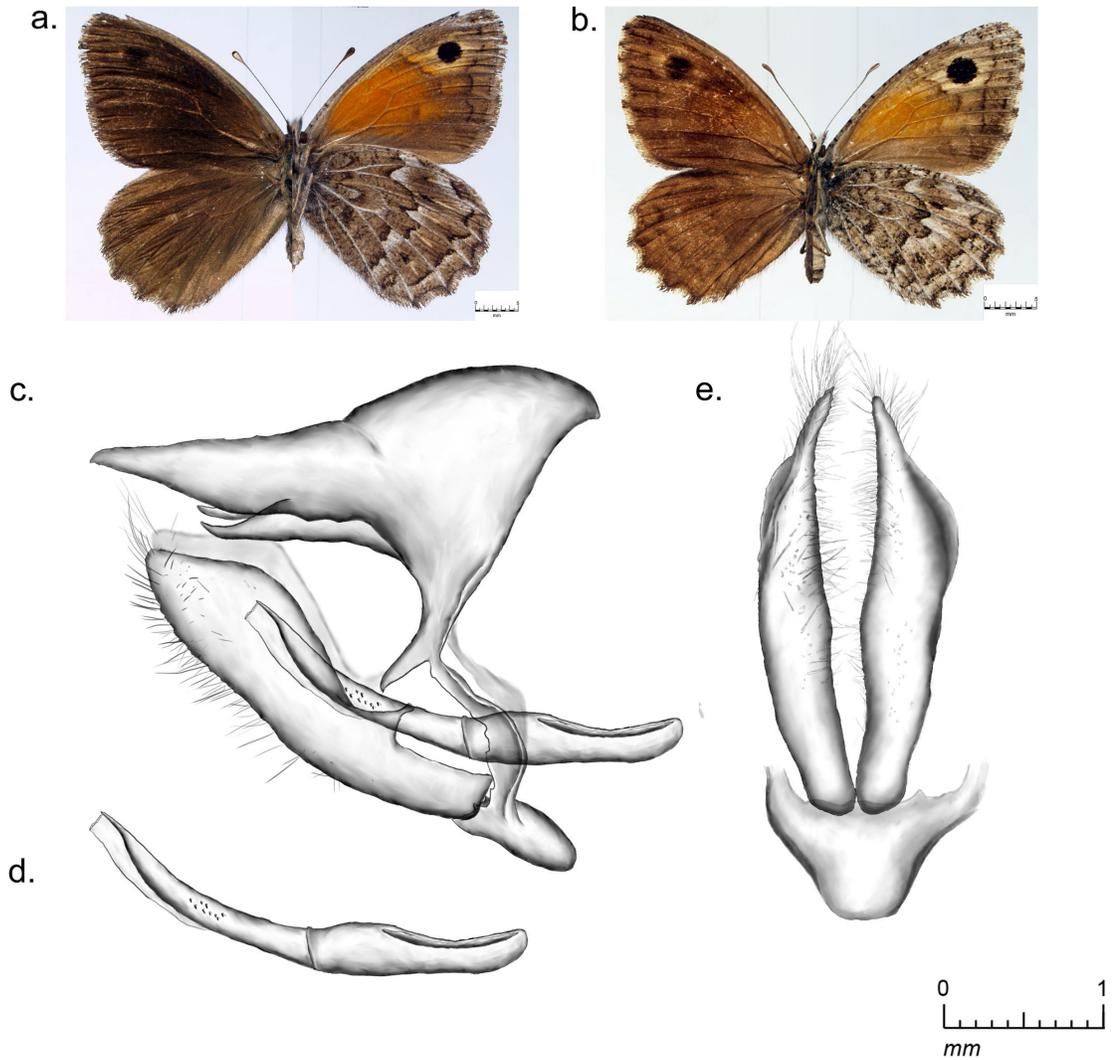


Figure 6-2. (a) Male dorsal (left) and ventral (right) and (b) female dorsal (left) and ventral (right) from the UJ collection. (c-e) male genitalia CH32-2 (d) showing ornamentation on the aedeagus

*Punargentus monticolens* (Butler, 1881) (*Hipparchia*) n. comb.

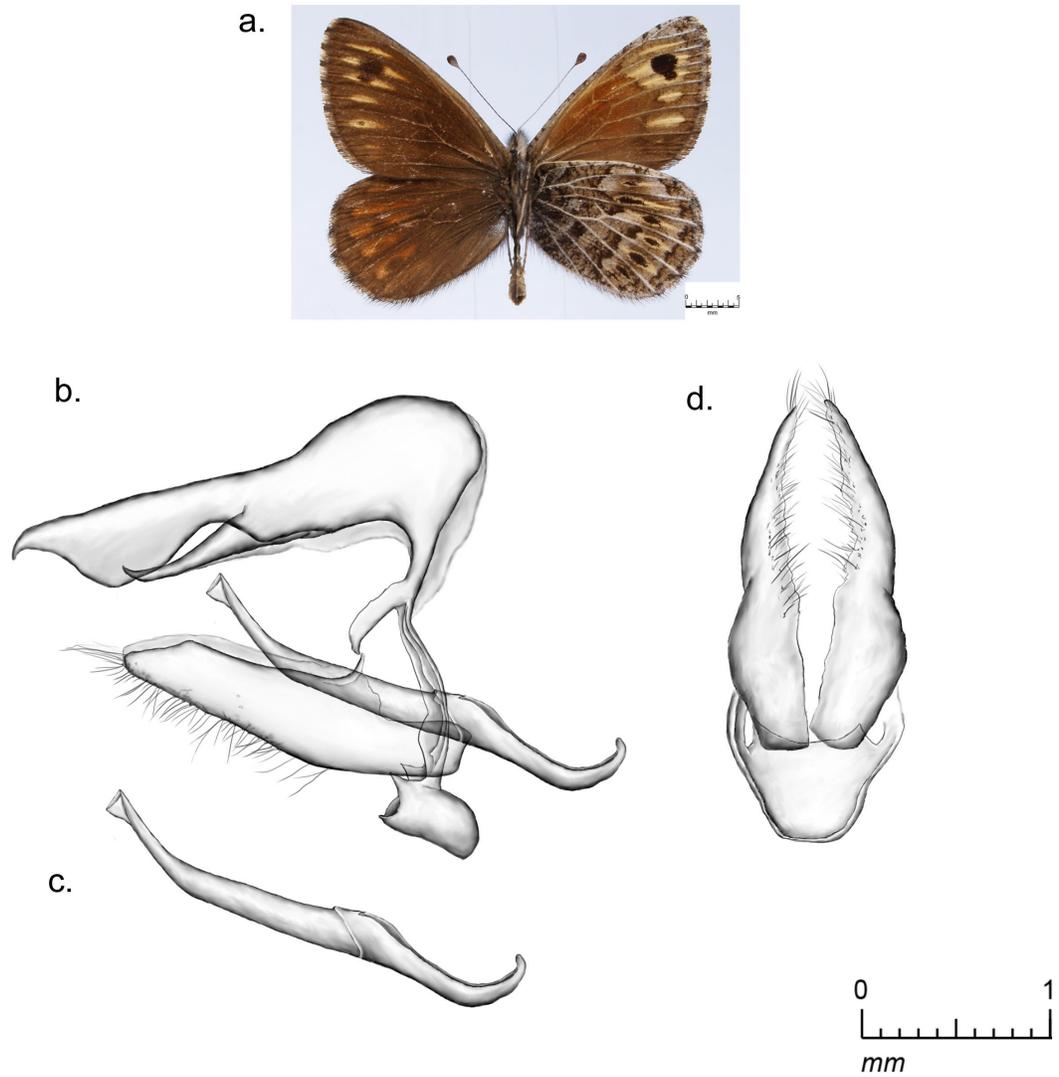


Figure 6-3. (a) Male dorsal (left) and ventral (right) from the UJ collection and (b-d) male genitalia

CH24A-5

*Pampasatyris* Hayward ,1953

Type species: *P. gyrtone* (Berg, 1877b) (*Epinephele*)

= *Haywardella* Herrera, 1966 syn. nov.

Included in this genus is *Haywardella*, originally described as a genus separate from *Neomaenas* on the basis of genitalic differences and the much-reduced forelegs that are characteristic of *Pampasatyris*. Wing patterning is similar throughout the genus, all species having a well-developed M1-M3 forewing ocellus often bipupillate and ringed in yellow on the dorsal side of the forewing and most species also having an additional ocellus between CuA1-CuA2 below the M1-M3 ocellus, both of which are also visible on the ventral side of the forewing. Males are without androconia. Hindwings are trapezoidal and may be entire to scalloped, the inner margin excavated between the anal vein and 1A+2A. Presence of ventral side hindwing ocelli varies by species, *edmondsii* having either none or small ocelli that are obscured by the ripple pattern present in most *Pampasatyris* and most other species with ocelli in each cell between M1 and CuA2, if not also between Rs-M1 and/or CuA2-1A+2A. Some species, such as *P. gyrtone*, *P. nilési*, and *P. quies* have the ventral side hindwing veins highlighted in white. The ventral side hindwing postmedian band is well defined in most species. All species examined bore antennae with spatulate clubs, cylindrical terminal palp segments, and very reduced forelegs with unsegmented tarsi. Eyes are naked and males with serrations or dentate projections on the aedeagus. These serrations are more pronounced in *P. nilési*

and appear as winglike projections such as in *A. argenteus*. All are distributed east of the Andes from central Bolivia and Minas Gerais province, Brazil to southern Neuquén and Buenos Aires provinces, Argentina.

Several species previously placed in *Punargentus* were unavailable for thorough examination, but are similar enough in wing patterning to others of this genus that there is no justification for placing them in another genus.

*Pampasatyrus imbrialis* and *P. yacantoensis* bear the distinctive bipupillate DFW ocellus between M1-M3. *P. ocelloides* and *P. periphas* have a clearly defined DFW ocellus between M1-M2, but unipupillate. *Pampasatyrus reticulata* (Weymer, 1907) is found near the Araucania moist forests of Rio Grande do Sul in southeastern Brazil (Santos et al., 2011) and the bold, black, reticulated pattern on the ventral wings for which it is named sets it apart from others of this genus. The DFW lacks the well-developed apical ocellus that is distinctive in other *Pampasatyrus*, but the available DNA sequence places *reticulata* firmly within this genus.

*Pampasatyrus gyrtone* (Berg, 1877b) (*Epinephele*)

Type location: Tandil, Buenos Aires province, Argentina

Lectotype: (male) MACN (photo examined)

Diagnosis: Similar to *Pampasatyrus nilesi*, but with the ventral side hindwing ocelli black and sometimes unipupillate and the postmedian band and

termen edged in white. Dorsal side coppery brown with the M1-M3 ocellus on the forewing appearing as a single, black to dark chocolate bipupillate spot ringed in maize yellow or as two distinct unipupillate ocelli fused at M2. Ventral side tawny with the postmedian band bordered in chocolate to dark chocolate brown on both wings. Forewing ocellus between M1-M3 bipupillate and ringed in maize yellow and another similar ocellus may appear between CuA1-CuA2. Ventral side of the hindwing bears a black, round to oval ocellus ringed in maize yellow in each cell from Rs to 1A+2A. Ventral side hindwing veins highlighted in white. Forelegs extremely reduced in both sexes and shorter than the second palp segment. Aedeagus with winglike projections at the median as in *Argyrophorus argenteus*.

Head: Antennae 8-10mm with tan to dark chocolate scales and terminating in a spatulate club. Eyes oval and naked, length approximately 1.3 times the width. Palps cream and tan in the females and in the males chocolate and dark chocolate on the ventral side and cream and chocolate on the dorsal side. Terminal palp segment cylindrical and a little more than one-third the length of the second segment.

Thorax dark amber with iridescent dark grey to brown scales, the females also bearing cream scales interspersed with the iridescent dark grey to brown scales. Abdomen dark chocolate dorsally and tan ventrally. Foreleg extremely reduced in size, measuring in its entirety less than the length of the second palp segment with the tarsi club-like and unsegmented in both sexes. Midlegs and hindlegs with four rows of black spines on the tibia and tarsus.

Forewing: Wingspan 30-35mm. Termen nearly straight and the distal end of the discal cell deeply sinuous with the distance between M1-M2 about equal to that between M2-M3. Males with no visible androconial patch. Dorsal side coppery brown with fringe scales in the same color. Postmedian band may appear as a barely discernible, slightly lighter patch of scales. Apical ocellus between M1-M3 appearing as a single, black to dark chocolate bipupillate spot ringed in maize yellow or as two distinct unipupillate ocelli fused at M2. Another, smaller ocellus sometimes appears between CuA1-CuA2 and may or may not bear a single white pupil. Ventral side tawny with a postmedian band outlined in dark chocolate brown. Median edge of the postmedian band irregular, edged in maize yellow, and curving sharply toward the M1-M3 ocellus at the costa. Subterminal edge of the postmedian band nearly straight, edged in white over the radials, and curving slightly toward the M1-M3 ocellus at the costa. Terminal band white with a chocolate brown proximal edge. Ocellus between M1-M3 black and bipupillate, ringed in maize yellow. Another, smaller, black ocellus ringed in maize yellow appears between CuA1-CuA2 and may or may not have a single white pupil.

Hindwing: Wing trapezoidal, termen slightly convex, barely scalloped, almost entire, and the inner margin slightly excavated between the anal vein and 1A+2A. Dorsal side coppery brown with fringe scales of the same color. Postmedian band may appear faintly as a slightly lighter band and/or patches of rust orange in each cell between M2-CuA2. Ocellus usually appearing between

CuA1-CuA2 as a dark chocolate brown spot ringed in rust orange to rust red. Other similar ocelli may appear in each cell between Rs-CuA1 and CuA1-1A+2A or not at all. Long piliform scales appear on both sexes at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side tawny dusted with white to cream scales and with chocolate striations in a ripple pattern over most of the wing. Proximal side of the postmedian band nearly straight, bordered in chocolate brown, and edged in white. Distal border deckle-edged and dark chocolate brown, the internal edge maize yellow toward the tornus and white toward the costa, the color changing at M2. Terminal band thin and white. Round to oval ocelli ringed in maize yellow present in each cell from Rs to 1A+2A, those between M1-M2, M2-M3, and CuA1-CuA2 slightly larger and may be unipupillate. Veins highlighted in white.

Male genitalia: Uncus narrow and finger-like, widening slightly just past where it fuses with the tegumen, narrowing to a blunt distal end, and approximately 1.1 times the length of the tegumen. Gnathos acute and a little less than half the length of the uncus, pedunculus long and U-shaped, and saccus deltoid and about half the length of the gnathos. Valvae narrow at the proximal one-fourth, then doubling in width and narrowing gradually to an acute distal end. Aedeagus nearly even in width along the distal one-half, wider at the median, bearing wing-like projections on each side, and narrowing abruptly to a thin and blunt proximal end.

Distribution: Can be found in Argentina from central Cordoba province to southern Santa Fe province to northern Buenos Aires province, south to Tandil in central Buenos Aires province, and as far north as the Serra Da Mantiqueira Mountains between Sao Paulo and the Western border of Rio de Janeiro province in Brazil from late January to March at nearly sea level to 2200m above sea level.

Specimens examined: Brazil, Estado Minas Gerais, (MGCL) 1 male, 1 female

*Pampasatyrus edmondsii* (Butler, 1881) (*Epinephele*) n. comb.

Type location: Termas de Chillán, Bío-Bío province, Chile

Holotype: (male) BMNH #809744 (specimen examined)

= *Satyrus montrolii* Berg, 1877 (not Feisthamel, 1839)

= *Satyrus thione* Berg 1882, repl. name

Type location: Tandil, Buenos Aires province, Argentina

Lectotype: (male) MACN, Buenos Aires? (photo examined)

= *Neomaenas tenedia* Weymer, 1907

Discussion: Locality labels on the holotype are confusing and contradict the locality mentioned in the original description: “Near Baths of Chillan, on slopes of Cordilleras, in March.’—T.E..” One label concurs with the original description, one reads “Valparaiso,” while another placed by Howarth (Herrera

1966) suggests Argentina as a more probable location. Hayward (1958) examined specimens from Buenos Aires, Catamarca, Cordoba, Entre Ríos, La Rioja, and Mendoza provinces, suggesting a wider distribution across Argentina than is represented by the collections I examined. Given that this broader distribution is exclusive of Chilean provinces and no other Chilean specimens are known, the type locality may indeed be in error. This species was last placed in the genus *Haywardella* on the basis of its much reduced forelegs, but it is precisely this feature as well as genitalic characters and similarities in wing patterning that place it in *Pampasatyrus*, which is also distributed east of the Andes.

Diagnosis: Most similar to *Pampasatyrus yacantoensis*, but lacking ocelli on the ventral side of the hindwing and with the hindwing termen more deeply scalloped. Somewhat similar to *Auca coctei*, but larger and the males lacking androconia. Like other members of *Pampasatyrus*, the forelegs are extremely reduced and forewing ocelli are clearly visible on the dorsal side. Ventral side of the hindwing bears a ripple pattern in dark coffee to black striations over the entire wing and lacks ocelli within the borders of the postmedian band. Subterminal edge of the postmedian band is dark coffee to black and stronger than the median edge. Male genitalia with the uncus long and fingerlike and the distal two-thirds of the valvae acute triangular. Aedeagus similar to *P. gyrtone*, but without the lateral winglike projections along the median.

Head: Antennae 8mm with white to cream scales and terminating in a spatulate club. Eyes round and naked, length approximately 1.2 times width. Palps white to tan with dark chocolate piliform scales on the ventral side. Terminal palp segment cylindrical and about two-fifths the length of the second segment.

Thorax bearing white to cream and tan scales with white and chocolate piliform scales, the abdomen cream to tan. Foreleg extremely reduced in size, the tarsus clublike and unsegmented in both sexes. Midlegs and hindlegs with four rows of dark amber spines on the tibia and tarsus.

Forewing: Wingspan 28-34mm. Termen nearly straight to slightly concave and the distal end of the discal cell a wide, flat U-shape. Males with no visible androconial patch. Dorsal side chocolate to dark chocolate brown with a ripple pattern along the costa in tan and dark coffee and fringe scales in white to chocolate. A rust orange patch appears over the discal cell, extending to the median edge of the postmedian band, which is a lighter orange than the discal cell and bordered in dark chocolate. Apical ocellus between M1-M3 appears as a round, dark chocolate to dark coffee spot ringed in daffodil yellow and another round ocellus of the same color, but not ringed in yellow appears between CuA1-CuA2. Ventral side with a ripple pattern in tan to yellow and dark coffee along the costa and subterminal band, fading to white and dark coffee at the apex. Rust orange extends over the discal cell to the median edge of the postmedian band, which is a lighter orange than the discal cell and bordered in dark chocolate.

Apical ocellus between M1-M3 is round, black, bipupillate, and ringed in daffodil yellow. Ocellus between CuA1-CuA2 appears as a small, round, unpupillated black spot ringed in daffodil yellow. Borders of the postmedian band are irregularly sinuate and widest between CuA1-CuA2, inner margin is taupe to chocolate.

Hindwing: Wing trapezoidal and the termen slightly convex and scalloped with the inner margin excavated between the anal vein and 1A+2A. Dorsal side and fringe scales similar in color to the forewing with the postmedian band appearing as a patch of rust orange between Rs and CuA1. Long piliform scales appearing on both sexes at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side taupe with a ripple pattern in dark coffee to black striations over the entire wing. Postmedian band taupe to tan with dark coffee to black striations and with deckle-edged borders, the subterminal edge stronger than the median edge.

Male genitalia: Uncus narrow and finger-like, widening slightly just past where it fuses with the tegumen, narrowing to a blunt end, and approximately 1.1 times the length of the tegumen. Gnathos acute and about length of the uncus, pedunculus long and U-shaped, and saccus U-shaped and a little more than half the length of the gnathos. Valvae widest at the proximal one-third and narrowing gradually to an acute triangular distal end. Aedeagus with minute lateral serrations, nearly even in width, slightly narrower at the distal end, and narrowing to a thin and blunt proximal end.

Distribution: Can be found in Argentina from central Cordoba province to central Mendoza province from October to February at 400-1500m above sea level.

Specimens examined: Argentina, Cordoba province, (MGCL) 1 male; Argentina, Mendoza province, (MTSU) JMC0812-JMC0815; Uncertain locality, (BMNH) Holotype male 809744

*Pampasatyurus glaucope glaucope* (C. Felder & R. Felder, 1867) (*Epinephele*)

Type location: Brazil

Holotype: male (BMNH) Rothschild bequest B.M. 1939-1, Felder Collection  
(photo examined)

= *Epinephele friedenreichi* Staudinger, [1887]

Type location: Estado Santa Catarina, Brazil

Lectotype: male (MFN, Berlin) (photo examined)

*Pampasatyurus glaucope boeninghauseni* (Foetterle, 1902) (*Epinephele*)

Type location: Estado Rio de Janeiro, Brazil

Holotype: male (MP, São Paulo?) Coll. J.G. Fötterle don. H. Ornstein 1931  
(photo examined)

= *Epinephele böninghauseni* Foetterle, 1902, missp.

Discussion: This rare species is listed in the Paraná state list of threatened species as vulnerable and restricted to a few, fragmented habitats in a geographic range of less than 2000 square kilometers [VUB2ab(ii, iii, iv)] and has not been collected since 1987 in spite of numerous recent expeditions to its known habitat (Dolibaina et al., 2010).

Diagnosis: Most similar to *Pampasatyrus quies*, but more saturated in color, with the ocelli and postmedian bands more clearly visible on the dorsal side, the pupils of the forewing ocelli blue on both the dorsal side and ventral side, and with a strong band of yellow at the median border of the postmedian band on the ventral side of the hindwing. Aedeagus with dentate projections at the distal one-third.

Head: Antennae 9-10mm with dark chocolate scales and terminating in a spatulate club. Eyes round and naked, length approximately the same as width. Palps chocolate brown with a horizontal tan stripe along the median. Terminal palp segment cylindrical and a little less than one-third the length of the second segment.

Thorax with iridescent black scales and chocolate piliform scales. Foreleg tarsi unsegmented in the males; females were unavailable for study. Midlegs and hindlegs with four rows of dark amber spines on the tibia and tarsus.

Forewing: Wingspan 34-36mm. Termen nearly straight to slightly convex and the distal end of the discal cell a wide U-shape. Males with no visible androconial patch. Dorsal side chocolate brown with a patch of rust orange from the cubital

edge of the discal cell and CuA2 to the inner margin. Postmedian band orange, both borders slightly deckle-edged and nearly straight with the subterminal side outlined in dark chocolate to dark coffee. Apical ocellus between M1-M3 is round, black, and pupillated with a large blue spot in each cell. Another round ocellus with a single large blue pupil spans the cell between CuA1-CuA2. Ventral side dark taupe to chocolate brown with a sparse ripple pattern in dark coffee striations from the submedian to the termen and along the entire length of the costa. Postmedian band is orange to rust orange with the median border dark coffee and barely deckle-edged and the subterminal border dark coffee, nearly straight, and stronger than the median border. Costal edge of the postmedian band tan to cream with dark coffee striations over the radials and extending to M2 on the median side of the M1-M3 ocellus and to M1 on the subterminal side. Apical ocellus between M1-M3 and ocellus between CuA1-CuA2 are as in the dorsal side, but with slightly smaller pupils and sometimes ringed in daffodil yellow to light orange. Subterminal band is tan with dark coffee striations.

Hindwing: Wing trapezoidal, termen slightly convex and barely scalloped, and the inner margin barely excavated between the anal vein and 1A+2A. Dorsal side similar in color to the forewing with the postmedian band orange to rust orange, deckle-edged at the median border, and deckle-edged and dark coffee brown at the subterminal border. Postmedian band fades to chocolate brown from M1 to the costa and a small, round, black ocellus may be visible between CuA1-CuA2 in some specimens. Long piliform scales appear at the base and

over the discal cell, extending to the median and toward the inner margin. Ventral side dark taupe with a dense ripple pattern of dark coffee striations over the entire wing. Median edge of the postmedian band with a thick daffodil yellow border outlined on the median side in dark coffee. Ripple pattern is barely visible in chocolate brown over the yellow stripe. Subterminal half of the postmedian band cream to dark taupe with dark coffee striations, lighter toward the costal edge and darker toward the inner margin. Subterminal border is dark coffee and barely deckle-edged. Small, black, oblong ocelli are barely visible between Rs-M1, M1-M2, and CuA1-CuA2 and may be ringed in rust red and bear a tiny white pupil. The CuA1-CuA2 ocellus may be obscured or absent and some specimens may have larger, more clearly visible ocelli.

Male genitalia: Uncus widest at the base, narrowing gradually to a blunt end, and a little less than 1.5 times the length of the tegumen. Gnathos acute and about four-tenths the length of the uncus. Pedunculus narrow and U-shaped, slightly attenuated at the ventral side end. Saccus widely U-shaped and about three-fifths the length of the gnathos. Valvae widest at the proximal one-fourth, the distal end nearly even in width and terminating in a blunt deltoid end. Aedaeagus nearly even in width throughout, slightly narrower at both proximal and distal ends, the distal one-third with dentate projections on each side and the proximal end terminating in a narrow U-shape.

Distribution: May be found in Brasil in the Serra da Mantiqueira Mountains, approximately 140km east northeast of São Paulo in November at around 2000m

above sea level. Dolibaina et al. (2010) place this species in eastern Paraná state.

Specimens examined: Brazil, São Paulo province, (MGCL) 1 male;  
Unknown locality, (BMNH) 789978

*Pampasatyrus nilesi* (A. G. Weeks, 1902) (*Cosmosatyrus*)

Type location: Sica Sica, Santa Cruz province, Bolivia

Lectotype: (male) MNCN 11057 AG Weeks Collection Oct. 1, 1899. Coll. A. G.

Weeks, Jr. (photo examined)

= *Faunula johanna* Weymer, 1911

Diagnosis: Similar to *Pampasatyrus gyrtone*, but with the hindwing ocelli yellow, the postmedian band on the ventral side of the hindwing reduced to a pair of thin dark chocolate lines at the median and subterminal edges, and the termen edged in dark chocolate. Dorsal side coppery brown with the postmedian band as barely discernable dark chocolate lines on both the forewing and hindwing. Ocelli between M1-M3 appear as a single round, bipupillate, black ocellus ringed in daffodil yellow or as two separate ocelli. Illustrations in the original description show both forms and states that “specimens intergrade nicely from one to the other.” Ventral side of the hindwing bears four yellow lenticular ocelli in each cell between M1 and CuA2 that are framed by two irregular, thin, dark chocolate lines that comprise the postmedian band. Forelegs are extremely reduced as in other

species of *Pampasatyrus* and the aedeagus is widest at the median one-third where it bears dentate projections on either side of the lateral plane.

Head: Antennae 8-9 mm with cream to chocolate scales and terminating in a spatulate club. Eyes oval and naked, length approximately 1.3 times the width. Palps white to tan dorsally and chocolate to dark chocolate ventrally. Terminal palp segment cylindrical and a little less than one-quarter the length of the second segment.

Thorax dark amber with iridescent black scales and chocolate brown piliform scales. Foreleg extremely reduced in size with the tarsi club-like and unsegmented in the males. Females were unavailable for study. Hindlegs with four rows of black spines on the tibia and tarsus.

Forewing: Wingspan 26-28 mm. Termen nearly straight and the distal end of the discal cell sinuous, the costal half more deeply curved than the cubital half. Males with no visible androconial patch. Dorsal side coppery brown with fringe scales in tan to chocolate brown. Postmedian band may appear as a barely discernible, slightly lighter patch of scales narrower between M3-CuA1 and outlined with a faint dark chocolate border. Apical ocellus between M1-M3 may appear as a single, black, bipupillate ocellus weakly ringed in daffodil yellow or as two separate ocelli. In the latter case, the M2-M3 ocellus is smaller and unpupillated, and shares the daffodil yellow ring with the larger M1-M2 black, unipupillate ocellus. Another similar ocellus appears between CuA1-CuA2 and may or may not bear a single white pupil. The original description suggests that

some specimens may lack the CuA1-CuA2 ocellus. Ventral side chocolate brown with a postmedian band outlined in dark chocolate brown. Postmedian band widest around the M1-M3 and CuA1-CuA2 ocelli and narrowest between CuA2-1A+2A with the median edge sharply sinuous and the subterminal edge irregular and nearly straight. Termen is edged in dark chocolate brown. M1-M3 ocellus is black, round, bipupillate, and strongly bordered in daffodil yellow. CuA1-CuA2 ocellus is similar but bearing only a single white pupil.

Hindwing: Wing trapezoidal, termen convex and entire, and inner margin barely excavated between the anal vein and 1A+2A. Dorsal side coppery brown with fringe scales in tan to chocolate brown. A thin, irregular, dark chocolate subterminal line may appear in some specimens as the distal border of the subterminal band. Long, blonde piliform scales appear on both sexes at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side similar in color to the ventral side of the forewing. A ripple pattern appears in faint dark chocolate striations from the base to the median border of the postmedian band. Borders of the postmedian band are thin and dark chocolate, narrowing abruptly between CuA2-1A+2A. Median border of the postmedian band is deckle-edged and the subterminal border is scalloped. A yellow lenticular ocellus appears in each cell between M1 and CuA2. The termen is edged in dark chocolate brown as in the forewing. Veins are highlighted in cream to tan.

Male genitalia: Uncus widest just past where it joins the tegumen, gradually narrowing to a blunt distal end, and approximately 1.2 times the length of the tegumen. Gnathos narrow, acute, and a little less than half the length of the uncus. Pedunculus long and U-shaped and saccus truncate and a little more than four-fifths the length of the gnathos. Proximal end narrow and finger-like, widening slightly toward the proximal one-third where it then abruptly doubles in width and narrows gradually to a blunt-acute distal end. Dorsal side curve of the valvae is gently sinuous while the ventral side is nearly straight. Aedeagus widest at the middle one-third where it bears dentate projections on each side. Distal end is slightly narrower and the proximal end narrows then widens slightly to a U-shaped terminus.

Distribution: Can be found in Bolivia in southern La Paz Department to southeastern Cochabamba Department, southward into Argentina in Tucumán province, and in Paraguay from December to April at 300 to 3100m above sea level.

Specimens examined: Argentina, Tucumán province, (MGCL) 1 male

*Pampasatyrus quies* (Berg, 1877) (*Satyrus*)

Type location: Carmen de Patagonia, Buenos Aires province, Argentina

Lectotype: (male) MNCN (photo examined)

Type location: Tandil, Buenos Aires province, Argentina

Paralectotype: MNCN (photo examined)

= *Cosmosatyrus quies* f. *plana* Weymer, 1911

Diagnosis: Most similar to *Pampasatyrus gyrtone*, but a little smaller, with the pupils of the ocelli on the forewing smaller and white rather than blue, and with the median border of the hindwing postmedian band scalloped and white rather than nearly straight and yellow. Projections on the aedeagus in *P. quies* protrude from a flange that extends laterally in a gentle arc on both sides and are more wing-like in *P. gyrtone*. Valvae closely resemble that of *P. glaucope*, but are rounder at the distal end.

Head: Antennae 8-9mm with cream and chocolate scales, terminating in a spatulate club. Eyes oval and naked, length approximately 1.2 times width. Male palps white at the base to chocolate at the distal end of the dorsal side with a longitudinal white stripe along the median and chocolate with chocolate and cream piliform scales on the ventral side. Female palps almost completely cream to white with the distal end of the dorsal side chocolate and chocolate to dark chocolate piliform scales on the ventral side. Terminal palp segment cylindrical and a little more than one-third the length of the second segment.

Thorax bearing iridescent black and chocolate brown scales with chocolate brown piliform scales in the males, the females similar with the addition of cream scales and cream piliform scales. Forelegs extremely reduced with the tarsi clublike and unsegmented in both sexes. Midlegs and hindlegs with four rows of amber spines on the tibia and tarsus.

Forewing: Wingspan 30-32mm. Termen nearly straight to slightly convex and the distal end of the discal cell widely U-shaped. Males with no visible androconial patch. Dorsal side tan to coppery brown with fringe scales in chocolate brown with a ripple pattern in dark chocolate striations along the costa and apex. Discal cell may have a slight peach blush that extends into the postmedian band. Postmedian band tawny to tan with nearly straight to barely crenate edges in tan to chocolate brown. Ocellus between M1-M3 black, round, bipupillate, and ringed in daffodil yellow. Another black, round ocellus ringed in daffodil yellow appears between CuA1-CuA2 and may be unipupillate. Ventral side chocolate and may fade to tawny toward the costal edge in some specimens. A ripple pattern appears in dark chocolate striations over most of the wing, but more strongly along the costal and subterminal edges. Apex and subterminal band are highlighted in white and a peach-brown blush may appear over the cubital edge of the discal cell and the cubital veins. Postmedian band tan to tawny or chocolate with both median and subterminal border dark chocolate brown and nearly straight. Median edge of the postmedian band daffodil yellow between M1-CuA2. Apical ocellus between M1-M3 similar to the dorsal side, but bolder. A small, round, black ocellus that shares the daffodil yellow ring with the M1-M3 ocellus may appear between M3-CuA1 as a distinct ocellus or as fused to the M1-M3 ocellus. An ocellus between CuA1-CuA2 appears as in the dorsal side, but bolder and unipupillate.

Hindwing: Wing trapezoidal, termen slightly convex, barely scalloped, almost entire, and the inner margin slightly excavated between the anal vein and 1A+2A. Dorsal side and fringe scales similar in color to the forewing with the postmedian band appearing as a red-orange to tawny patch with a chocolate to dark chocolate deckle-edged subterminal border. Ventral side chocolate to taupe with dark chocolate striations in a ripple pattern over the entire wing. Postmedian band cream to tan with dark chocolate borders, the median border scalloped with the space between scallops at M3 extending a little farther toward the discal cell into a white triangle and the subterminal border, when distinguishable, deckle-edged and thicker than the median border. Black lenticular ocelli appear between Rs-M1 and M1-M2, the latter larger than the former and both ringed in daffodil yellow. The ocellus between M1-M2 may be unipupillate. Other, similar ocelli may appear between M2-M3, CuA1-CuA2, and rarely between M3-CuA1. Veins may be highlighted in tan to white.

Male genitalia: Uncus widest where it joins the tegumen, narrowing gradually to a blunt distal end, and approximately 1.3 times the length of the tegumen. Gnathos acute and about three-eighths the length of the uncus. Valvae generally wide, the proximal half acute triangular with a blunt proximal end. Distal half with the ventral side edge nearly straight and the dorsal side edge proceeding from the distal end in a wide curve that begins at about a 60° angle from the ventral side edge and flattens as it approaches the median. Aedeagus widest at the distal one-third bearing dentate projections on each side, slightly

narrower at the distal end, and narrowing toward the proximal end to about half the width at the proximal one-third to a truncate terminus.

Distribution: Can be found in eastern Paraná State, Brazil, southwest through Uruguay to the southernmost part of Buenos Aires province, Argentina from December to March and possibly as late as May in the southernmost part of its range at nearly sea level to 3000m above sea level.

Specimens examined: Uruguay, Montevideo province, (CU) 1 male;  
Argentina, Rio Negro province, (MTSU) JMC0809

*Pampasatyrus gyrtone* (Berg, 1877)(*Epinephele*)

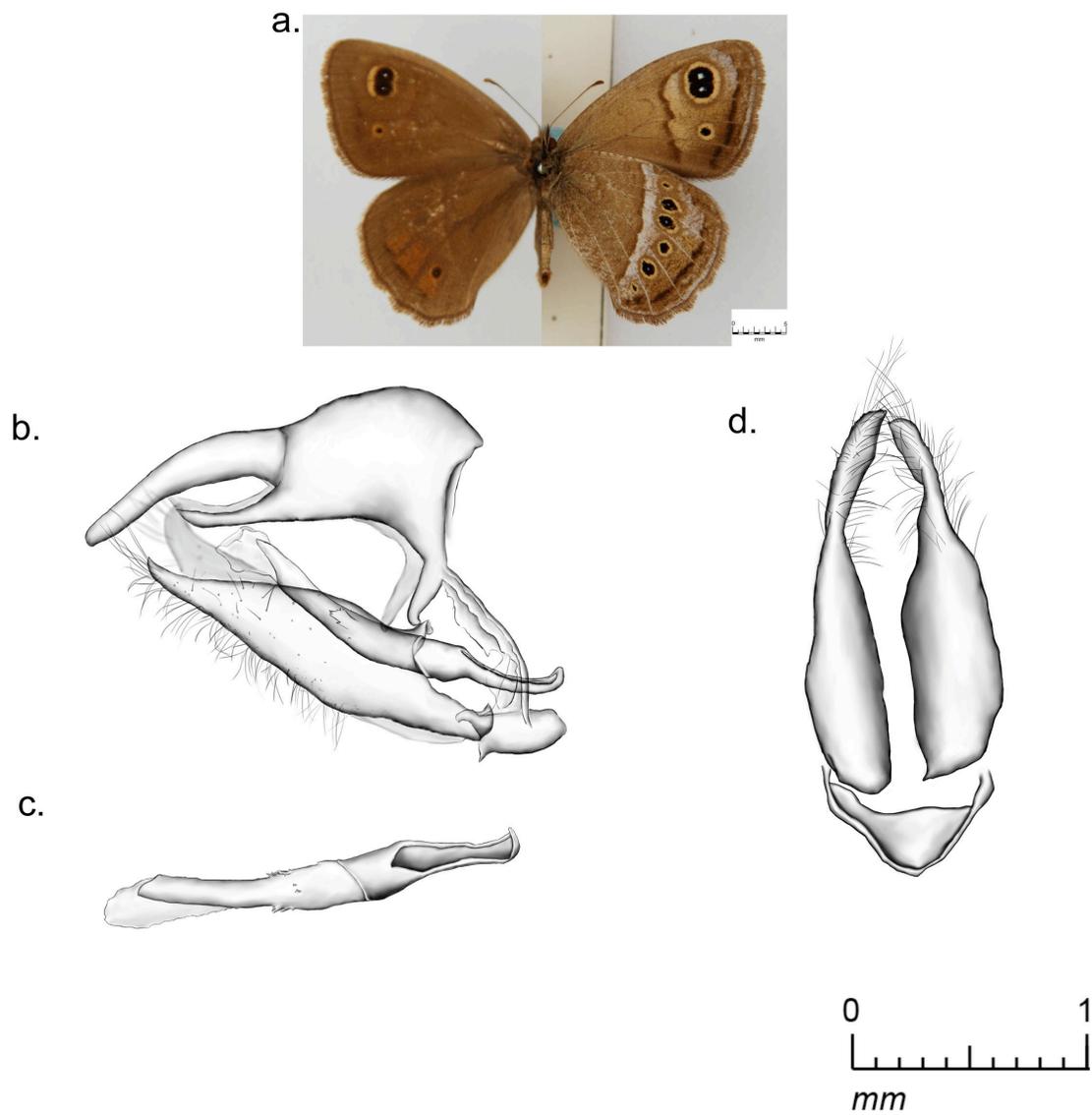


Figure 4-1. Male dorsal (left) and ventral (right) BMNH#809453 and (b-d) male genitalia from MGCL collection

*Pampasatyrus edmondsii* (Butler, 1881) n. comb. (*Epinephele*)

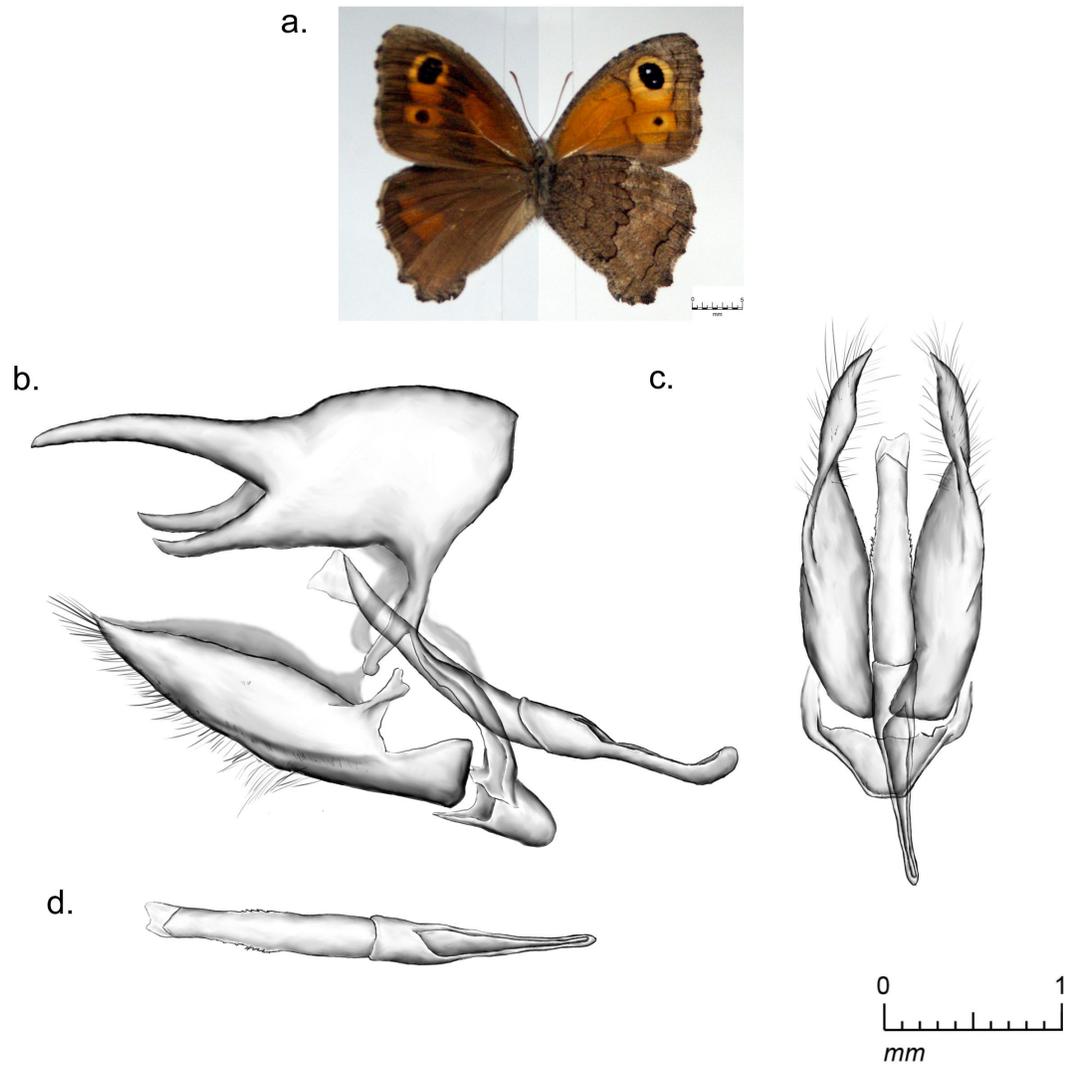


Figure 7-2. (a) Male dorsal (left) and ventral (right) and (b-d) male genitalia from the UJ collection (d) showing ornamentation on the aedeagus

*Pampasatyrys glaucope* (C. Felder & R. Felder, 1867)(*Epinephele*)

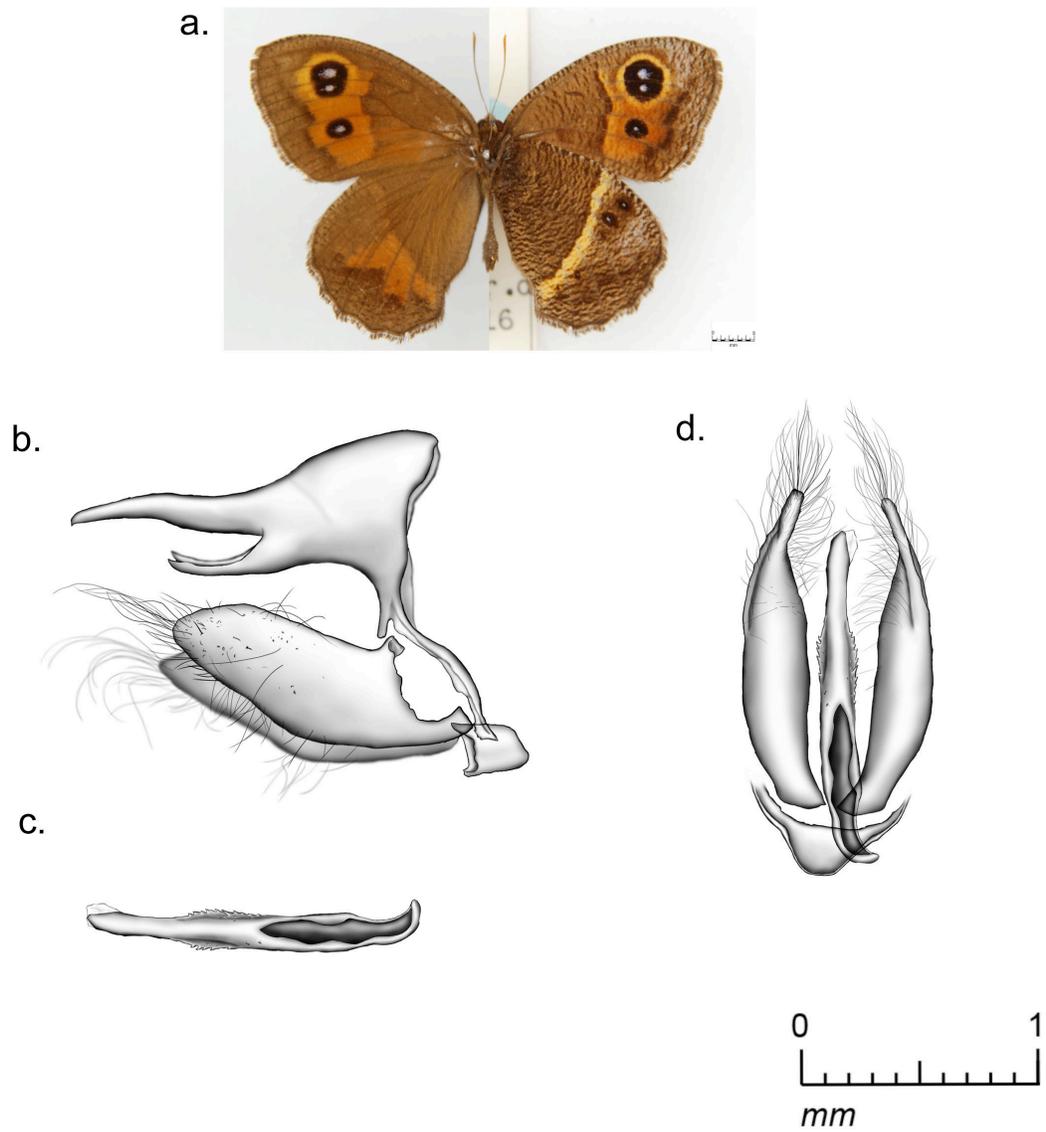


Figure 7-3. (a) Male dorsal (left) and ventral (right) BMNH#789978 and (b-d) male genitalia from the MGCL collection (c) showing ornamentation on the aedeagus

*Pampasatyrus nilesi* (C. Felder & R. Felder, 1867)(*Epinephele*)

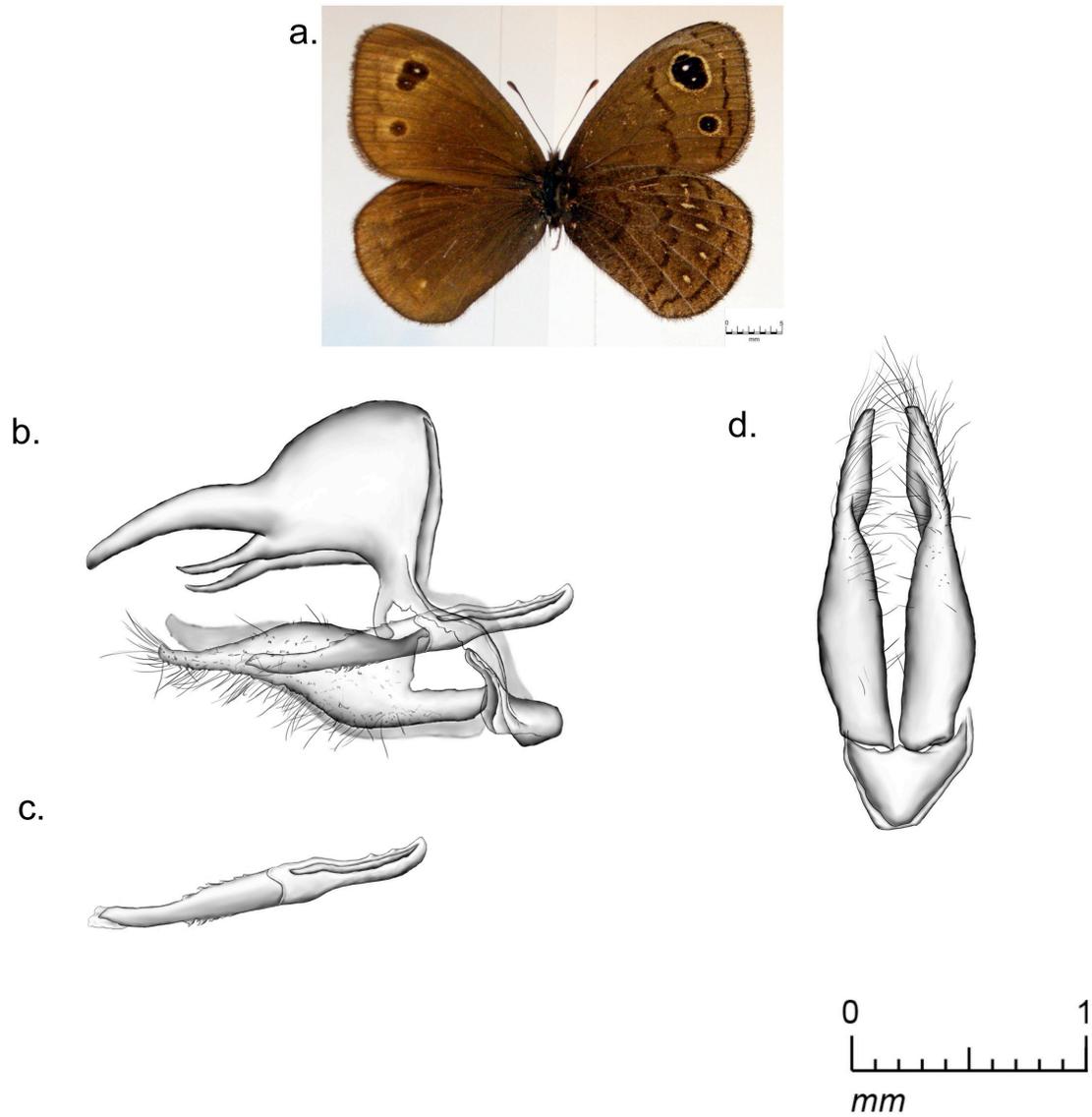


Figure 7-4. (a) Male dorsal (left) and ventral (right) from the UJ collection and (b-d) male genitalia from the MGCL collection, (c) showing ornamentation on the aedeagus

*Pampasatyrus quies* (Berg, 1877)(*Satyrus*)

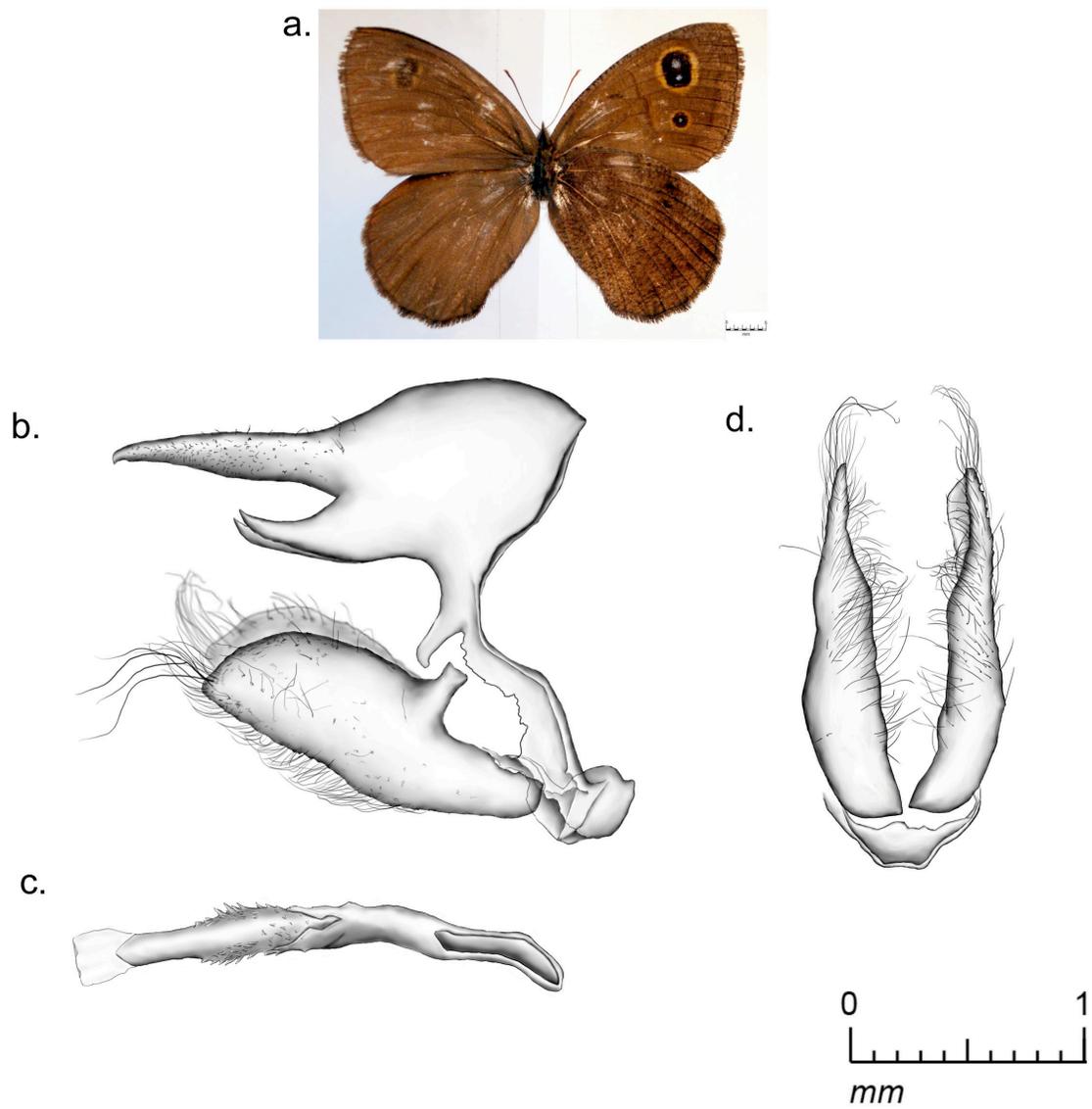


Figure 7-5. (a) Male dorsal (left) and ventral (right) from the UJ collection and (b-d) male genitalia BMNH#808376, (c) showing ornamentation on the aedeagus

*Pamperis* Heimlich, 1959

Type species: *Pamperis poaoeneis* Heimlich, 1959

In the original description, Heimlich associated *Pamperis poaoeneis* with *Cosmosatyrus*, but he considered the resemblance insufficient for placing in this genus, and created the monotypic genus *Pamperis* for this unusual species based primarily on peculiarities in the wing venation. Miller (1968) further set *Pamperis poaoeneis* apart as a genus of uncertain position, again due to its unusual venation, noting that "the veins in the apical portion of the forewing are arranged like no known Satyrid." Pyrcz & Wojtusiak (2010) synonymized *Pamperis* with *Argyrophorus*, but noted its unusual venation, the absence of an M1-M2 ventral forewing ocellus, and antennae only partially covered in scales as features that set it apart. In other words, it is very little like *Argyrophorus* at all. Miller also noted, "Until these structures, as well as others not considered in the original description, have been studied, it will be quite impossible to assign this genus to its proper position among the Satyridae." Molecular data confirm what morphology suggests: that *Pamperis poaoeneis* is unique and wholly separate from *Argyrophorus* or any other known genus and situated neatly in the infratribe Neomaeniti. *Pamperis*, then, remains a valid monotypic genus.

*Pamperis poaoeneis* Heimlich, 1959

Type location: Osorno, Chile at 1300m

Holotype: (male) ZSM No. 296 (photo examined)

Diagnosis: Without a red patch on the dorsal forewing and lacking an M1-M2 ocellus on the ventral forewing with four small, white ocelli between M1 and CuA2 on the ventral hindwing. Forewing discal cell lacks M1-M2 and M2 extends several millimeters into the discal cell. Rs1 fuses with Sc three quarters of the way from Sc.

Forewing: Wingspan approximately 30mm. Termen entire with the discal cell lacking the M1-M2 vein. M2 extends several millimeters into the discal cell and Rs1 fuses with Sc three quarters of the way from the base of the wing to the costa rather than continuing to the costa more or less parallel to Sc. Fringe scales are cream and dark brown, giving the appearance of fine crenulation. Dorsal wing is evenly dark brown while the ventral wing is dark coffee brown at the proximal half with a lighter postmedian band, deckle edged at the proximal border and nearly straight at the distal border. Subterminal band is darker brown. Ocellus between M1-M2 is completely absent.

Hindwing: Hindwing oval with the termen barely scalloped and the dorsal side similar in color to the dorsal forewing. Discal cell is more or less spatulate, Rs-M1 bulging outward and M1-M2 curving inward only very slightly. Ventral hindwing with a ripple pattern in dark coffee striations over the entire wing. Proximal two-thirds of the wing is darker brown and the postmedian band is lighter brown, extending to the termen, and with the proximal border deckle-edged.

*Stuardosatyrus* Herrera & Etcheverry, 1965

Type species: *Stuardosatyrus williamsianus* (Butler, 1868) (*Argyrophorus*)

Discussion: Butler described a single, somewhat tattered female specimen that has the distinction of having been collected by Charles Darwin, though the original description is sparse and entirely based on wing patterning. Heimlich (1963) followed *williamsianus* through the literature from its original placement in *Argyrophorus*, to *Chionobas* in Mabilie (1884), to *Satyris* in Staudinger (1899), to *Cosmosatyris* in Elwes (1902), and demoted to a subspecies of *Cosmosatyris chiliensis* in Hayward (1958). Heimlich then returned *williamsianus* to its original position in *Argyrophorus* in his revision of the genus and Herrera & Etcheverry (1965) created a new genus, *Stuardosatyris*, mainly on the basis of venation and differences in male genitalia. Pyrcz & Wojtusiak (2010) again returned *williamsianus* to their broadly-defined *Argyrophorus*, though with little evidence regarding the justification of this placement.

Wing patterning somewhat resembles both *Argyrophorus* and *Punargentus*, but the pupillated M1-M2 ventral forewing ocellus sets it apart from *Punargentus* and, in addition to the lack of silver coloration, it is unlike *Argyrophorus* in the ventral hindwing postmedian band and the lack of yellow rings around the hindwing ocelli. Genitalic features further set it apart. The shape of the saccus, the shape of the aedeagus, and the general shape of the valvae as well as the deep serrations across the dorsal edge of the valvae indicate

sufficient difference to warrant placement in a separate genus from *Argyrophorus* and *Punargentus*. Thus, *Stuardosatyrus*, named for Professor Don Carlos Stuardo, remains a valid genus.

*Stuardosatyrus williamsianus* (Butler, 1868)(*Argyrophorus*)

Type locality: Puerto Hambre, Magallanes, Chile

Holotype: (female) BMNH #809625 (Specimen examined)

Diagnosis: Southern species with coppery dorsal wings that are white at the costa of the forewing. Ventral forewing with a red-orange triangular postmedian band edged in dark chocolate brown that is widest toward the costa and narrowing to a rounded point between M3-CuA1. Apical M1-M2 ventral forewing ocellus is oval with a single, small, white pupil. Hindwing is oval with six lenticular ocelli in each cell from Rs to the anal vein that are neither ringed in yellow nor pupillated. Proximal border of the ventral hindwing postmedian band is irregularly scalloped, edged in dark chocolate brown, and bordered in white. Distal edge of the ventral hindwing postmedian band is a thin, dark chocolate line that curves nearly parallel to the termen and may cross through the ocelli.

Head: Antennae 13-15mm, covered in chocolate brown scales with a longitudinal stripe of white scales, the club being mostly brown. Eyes are oval and naked, length a little less than 1.3 times width. Palps almost entirely white to cream with dark chocolate piliform scales on the ventral side. Terminal palp segment is conical.

Thorax with black iridescent and tan piliform scales in the males; females not available for examination. Male foreleg tarsi fused into a single club-like segment without spines and midlegs with four rows of amber spines. Abdomen is dark coffee with sparse white scales on the ventral side.

Forewing: Wingspan 24-32mm. Termen entire and slightly convex and the discal cell curving only slightly inward at M1-M2. Forewings without androconia. Dorsal side is chocolate brown with a coppery sheen and white at the costa. Fringe scales are coppery brown layered on top of white. Dorsal postmedian band may appear as a series of triangular orange-red patches between the radials and CuA2 and the M1-M2 ocellus is visible as a dark chocolate oval patch. Ventral forewing is chocolate brown, white at the costa, with a small patch of black scales at the base. An orange-red patch appears just distal to the discal cell and adjacent the postmedian band, which is orange-red, edged in dark chocolate brown, and roughly triangular with the widest part toward the costa and narrowing to a rounded end between M3-CuA1. An R5-M1 ocellus may appear as a small, black, lenticular spot ringed in orange and a similar, round ocellus may appear between M2-M3. The apical ocellus between M1-M2 is oval, ringed in orange, and contains a very small white pupil.

Hindwing: Wing oval, termen entire and convex. Dorsal side similar in color to the forewing, but without orange-red patches. Fringe scales are as in the forewing and long, tan piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side from the base

to the postmedian band is chocolate brown with a ripple pattern in dark coffee to black striations. Postmedian band is irregularly scalloped and black at the proximal edge with a white stripe adjacent the proximal border that fades to brown. Subterminal edge is a thin black line that may cross through the ocelli and the terminal edge is black. A black lenticular ocellus appears in each cell between Rs and the anal vein.

Male genitalia: Uncus widest at the base, tapering gradually to a blunt terminus and slightly less than one and one-third times as long as the tegumen. Gnathos acute and a little more than one-third the length of the uncus. Pedunculus U-shaped and long. Saccus is deltoid and a little shorter than the gnathos. Aedeagus is acute at the proximal end, widening toward the middle and narrowing at the distal third before widening again at a cluster of several spines, narrowing just distal to the spines and widening slightly toward the distal end. Proximal end of the aedeagus is spatulate in the lateral view. Valvae are roughly rhomboid with the dorsal edge deeply serrated and the distal end acute. Distribution: Can be found from central Santa Cruz province in Argentina near Monte San Lorenzo south to the Straits of Magellan in late January to early February at 800-2300m above sea level.

Specimens examined: Chile, Magallanes province, (BMNH) Holotype female #809625; (MTSU) 4 males: JMC0301, JMC0306, JMC1003, JMC1004, (UJ) 6 males, 13 females; Argentina, Santa Cruz province, (UJ) 3 males

*Stuardosatyrus williamsianus* (Butler, 1868)(*Argyrophorus*)

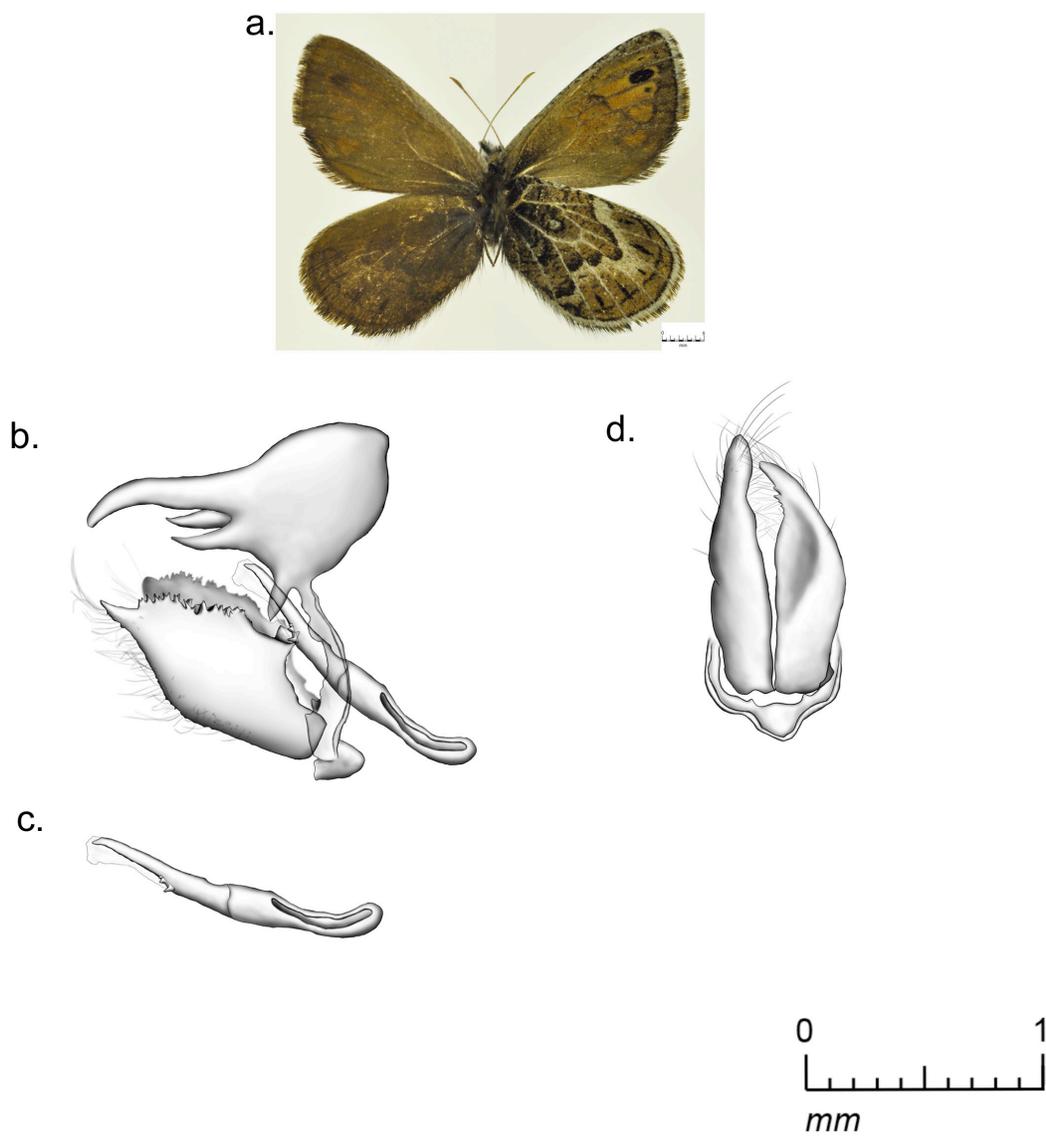


Figure 8-1. (a) Male dorsal (left) and ventral (right) and (b-d) male genitalia JMC1003, (c) showing ornamentation on the aedeagus

### Redescriptions: The Neosatyriti

*Nelia* Hayward, 1953

Type species: *N. nemyroides* (Blanchard, 1852) (*Satyrus*)

Both species of *Nelia* are very similar, each often mistaken for the other in collections. Sexual dimorphism in wing patterning as well as in tarsal segmentation is more distinct than in most other south-temperate pronophiline genera. Many taxa, especially those in which androconia may be present in the males, will show minor wing pattern differences in the forewing between the sexes, but this difference is more pronounced in *Nelia* and *Argyrophorus*. Other genera are sexually dimorphic in foreleg tarsal segmentation, such as in *Tetraphlebia* and some species of *Cosmosatyrus*, *Neomaenas*, and *Neosatyrus*, but with only minor differences in wing patterning. Both wing patterning and foreleg tarsal segmentation differences appear in *Nelia* with genitalia that are marginally similar to that of *Neosatyrus* and *Pampasatyrus* in the triangular proximal end of the valvae. The dorsal side of the forewing of the males is dark chocolate brown with heavy androconia, and females bear a clearly visible postmedian band. Apical ocellus between M1-M3 is visible on the dorsal side of the females and only barely so in *calvertii* males. The ventral side of the forewing of both sexes bears an M1-M3 ocellus that may or may not be pupillated, a ripple pattern, and a strong, orange, roughly triangular postmedian band. Hindwings are trapezoidal, scalloped at the termen, and excavated at the inner margin between the anal vein and 1A+2A. A ripple pattern with dark chocolate striations

and small, yellow ocelli appear on the ventral side of the hindwing. Both species with spatulate antennal clubs, a deeply sinuous distal end of the discal cell, naked eyes, and cylindrical terminal palp segments. Foreleg tarsi with three segments in the males and *nemyroides* females with five segments and visible spines. Hayward implies that tarsal segmentation and the appearance of spines in *calvertii* females is the same as in *nemyroides* females. Male genitalia with valvae roughly triangular at the proximal end and an uncus that is slightly narrower where it joins the tegumen, widening, then tapering to a blunt distal end.

*Nelia nemyroides* (Blanchard, 1852) (*Satyrus*)

Type location: Coquimbo province, Chile

Lectotype: (female) MNHN, Paris (photo examined)

Diagnosis: Most similar to *Nelia calvertii*, but generally bolder in color and with the forewing termen more concave. *N. calvertii* bears additional ocelli on the forewing between M3 and 1A+2A and the postmedian band on the dorsal side of the forewing of the females is wider and more triangular in *N. nemyroides*. Apical ocellus between M1-M3 on the ventral side of the forewing lacks the daffodil yellow ring present in *N. calvertii* and may be pupillated. Male genitalia differ most notably in that the pedunculus is longer and U-shaped, saccus is shorter

and truncate, and the aedeagus is narrower at the distal end and wider at the proximal end than in *N. calvertii*.

Head: Antennae 7-8 mm with chocolate to dark chocolate scales and white to cream scales at the joints, terminating in a spatulate club. Eyes oval and naked, length approximately 1.1 times width. Palps white at the base, chocolate to dark chocolate brown dorsally, and dark coffee interspersed with white ventrally. Female palps are similar to that of the males, but with more white scales than dark coffee scales on the ventral side. Terminal palp segment cylindrical and about one-fifth the length of the second segment.

Thorax of the males with iridescent black scales and chocolate to dark chocolate piliform scales. Females the same, but with sparse white scales in addition to the iridescent black. Forelegs with three tarsal segments in the males and five in the females, females bearing several rows of spines along the length of the tarsus as in the midlegs and hindlegs. Midlegs and hindlegs of both sexes with four rows of amber spines on the tibia and tarsus.

Forewing: Wingspan 26-28mm. Termen nearly straight to somewhat concave and the distal end of the discal cell sinuate with the cubital end straighter than the radial end. Males with a heavy androconial patch clearly visible on the dorsal side that extends from M1 almost to the inner margin and over most of the discal cell. Fringe scales are dark chocolate layered over cream to white in stripes perpendicular to the termen. Dorsal side chocolate to dark chocolate brown, the males with a barely visible postmedian band in rust red to

rust orange just distal to the androconial patch. Females chocolate to dark chocolate brown with a clearly visible triangular postmedian band in rust orange with the widest part along the radials, terminating between CuA2 and the anal vein. The apical ocellus appears on the dorsal side in the females between M1-M3 as a round spot in dark coffee, rarely with one or two pupils appearing at the center in rust red. Ventral side chocolate to dark chocolate brown with a ripple pattern in white and dark chocolate appearing along the costa and over the radial veins, more strongly so at the apex than toward the base. Postmedian band appears in both sexes as in the dorsal side of the females, but with more defined edges that are dark coffee and nearly straight to deckle-edged on both sides. Apical ocellus between M1-M3 appears as a dark coffee to black spot, usually unpupillated, but occasionally with one or two white pupils.

Hindwing: Wing trapezoidal, termen slightly convex and scalloped. Inner margin excavated between anal vein and 1A+2A. Dorsal side similar in color to the forewing with the postmedian band appearing as rust orange to rust red patches in each cell between M1 and CuA2. Fringe scales are as in the forewing and long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side dark chocolate to dark coffee with a ripple pattern in tan to white, lavender in the males, from the base to the postmedian band and from the postmedian band to the termen. Postmedian band is tan to chocolate with a ripple pattern in dark chocolate to dark coffee striations. Both borders of the postmedian band are dark chocolate to

dark coffee and irregularly scalloped. Within the postmedian band along the costal and median edge is a roughly triangular patch of white to cream scales, the widest part of the triangle along the costa, narrowing toward M3. A small, round, daffodil yellow ocellus appears in each cell between Rs and 1A+2A with two such ocelli sometimes appearing between CuA2-1A+2A. Some hindwing ocelli may be absent or obscured.

Male genitalia: Uncus about 1.2 times longer than the tegumen and generally wide, but widest at the median, slightly narrower where it joins with the tegumen, and narrowing gradually toward a blunted acute distal end that hooks slightly toward the valvae. Gnathos narrow, acute, and a little more than half the length of the uncus. Pedunculus long and U-shaped. Saccus truncate and a little less than one-third the length of the gnathos. Valvae acute triangular at the proximal half, the widest part at the median and the proximal end blunt. From the median to the distal end, valvae are nearly even in width, attenuating at the distal one-fourth to a deltoid terminus. Aedeagus widest at the median, narrowing slightly toward a truncate proximal end and narrowing gradually toward a distal end that is approximately one-fifth the width of the median.

Distribution: Can be found in Chile from southern Bío-Bío province southward to northern Los Lagos province from December to March at 50 to 2300m above sea level. Hayward (1958) found specimens in Neuquén and Chubut provinces, Argentina and Blanchard (1852) notes in the original

description that it can be found in Coquimbo province, 650km north of the northernmost extent of the range.

Specimens examined: Chile, Coquimbo province, (MNHN, Paris)

Lectotype female; Chile, Bío-Bío province, (CU) 2 males; Chile, Araucanía province, (OSU) 000093679; Chile, Los Lagos province, (MTSU) CH8-2; Chile, unknown province, (BMNH) 809537

*Nelia calvertii* (Elwes, 1903) (*Elina*)

Type location: Termas de Chillán, Chile

Lectotype: (male) BMNH #809740 (specimen examined)

Paralectotype: (female) BMNH #809739 (specimen examined)

Paratypes: (male) BMNH #789957 (specimen examined); (female) Lago Quillén, Neuquén province, Argentina BMNH #789959 (specimen examined)

Discussion: Two specimens are described in Elwes (1903) as the type specimen of *N. calvertii* and two are labeled as such in the British Museum. All else being equal, I have designated the male as the lectotype.

Diagnosis: Most similar to *Nelia nemyroides*, but with the forewing termen less concave and generally lighter in color. Postmedian band on the dorsal side of the forewing of the females is wider and more triangular in *N. nemyroides* than in *N. calvertii*, the latter being more elongated and bearing additional round, chocolate to black ocelli in each cell between M3 and 1A+2A. Male genitalia

differ most notably in that the pedunculus is shorter, wider and more triangular, the saccus is longer and widely U-shaped, and the aedeagus is wider at the distal end than in *N. nemyroides*.

Head: Antennae 8-9 mm with chocolate scales and white to cream scales at the joints, terminating in a spatulate club. Eyes oval and naked, length approximately 1.3 times width. Palps chocolate to dark chocolate brown with sparse cream scales both dorsally and ventrally and with chocolate to dark chocolate and black piliform scales ventrally. Terminal palp cylindrical and less than one-fifth the length of the second segment.

Thorax with iridescent black scales and chocolate to dark chocolate piliform scales. Forelegs with three tarsal segments in the males. Midlegs and hindlegs with four rows of amber spines on the tibia and tarsus. Female examined lacked head and thorax.

Forewing: Wingspan 26-30mm. Termen nearly straight to slightly concave and the distal end of the discal cell sinuate with the cubital end straighter than the radial end. Males with a heavy androconial patch clearly visible on the dorsal side and extending from M1 to the inner margin and into the discal cell on the cubital side. Fringe scales are chocolate layered over ivory, giving the false appearance of crenulation at the termen. Dorsal side chocolate to dark chocolate brown, the males darker. Postmedian band is visible on the dorsal side in the females as a streak of light orange surrounding the forewing ocelli and in the males as a barely visible band just distal to the androconial patch and slightly

lighter than the rest of the wing. A round, black M1-M3 ocellus visible in both sexes, but barely so in the males. Similar, but much smaller ocelli, may appear between M3-CuA1 and CuA1-CuA2, particularly in the females. Ventral side red-orange to orange from the base to the postmedian band and chocolate brown along the costa, inner margin, and subterminal band. Costa and subterminal band with some white background scales and bearing a ripple pattern with dark chocolate striations that is more visible in the females. Postmedian band orange and roughly triangular, the widest part spanning the radials and narrowing toward the anal vein. Median border of the postmedian band is chocolate brown and nearly straight while the subterminal border is dark chocolate and deckle-edged. Apical ocellus is round, black, ringed in daffodil yellow, and spans M1-M3. This ocellus may have a single white pupil at its center between M1-M2.

Hindwing: Wing trapezoidal, termen slightly convex and scalloped. Inner margin excavated between anal vein and 1A+2A. Dorsal side dark chocolate to chocolate brown with the postmedian band appearing as a narrow patch of red-orange to orange from M2 to the tornus in the females and from M3 to CuA2 in the males. Fringe scales are as in the forewing and long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side taupe to chocolate with a ripple pattern in dark chocolate striations superimposed over all design elements. Both borders of the postmedian band are dark chocolate, the median border is deeply deckle-edged while the subterminal border is shallowly deckle-edged or nearly straight. Median

half of the postmedian band is white, fading to tan to tawny or chocolate in the subterminal half. A small, round, daffodil yellow ocellus appears in each cell between Rs and 1A+2A with two such ocelli sometimes appearing between CuA2-1A+2A. Some or all hindwing ocelli may be absent or obscured.

Male genitalia: Uncus widest just past where it joins with the tegumen, narrowing gradually toward a blunt distal end, and approximately 1.3 times longer than the tegumen. Gnathos narrow, acute, and approximately half the length of the uncus. Pedunculus short, wide, and U-shaped. Saccus widely U-shaped and a little more than two-fifths the length of the gnathos. Valvae are acute triangular at the proximal end, widest at the proximal one-third, and narrowing gradually toward the distal one-third where they abruptly attenuate, terminating in a narrow, truncate distal end. Aedeagus widest at the proximal one-third, narrowing gradually toward the distal one-third where it widens slightly. Proximal end of the aedeagus attenuates abruptly from the widest point, terminating in an obtuse triangular end.

Distribution: Can be found in Chile from northeastern Bío-Bío province southward to eastern Araucanía province and eastward into southwestern Neuquén province, Argentina near Lago Quillén from December to February at 200 to 1850m above sea level.

Specimens examined: Chile, Bío-Bío province, (BMNH) Lectotype male 809740, Paralectotype female 809739, Paratype male 789957, (MTSU) CH24A-2, (CU) 1 male; Argentina, Neuquén province, Paratype female 789959

*Nelia nemyroides* (Blanchard, 1852)(*Satyrus*)

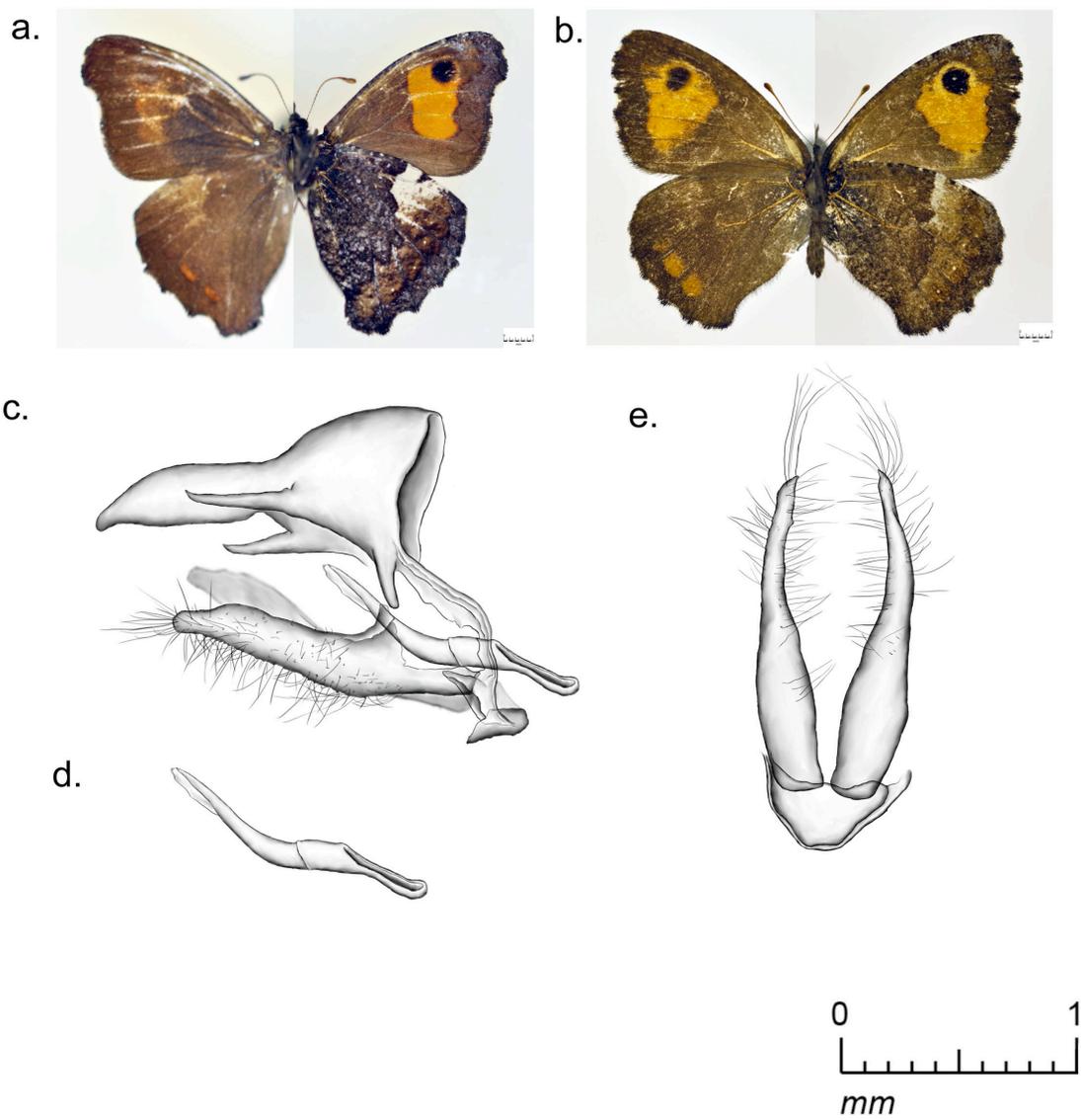


Figure 9-1. (a) Male dorsal (left) and ventral (right), female dorsal (left) and ventral (right), and male genitalia from the CU collection

*Nelia calvertii* (Elwes, 1903)(*Elina*)

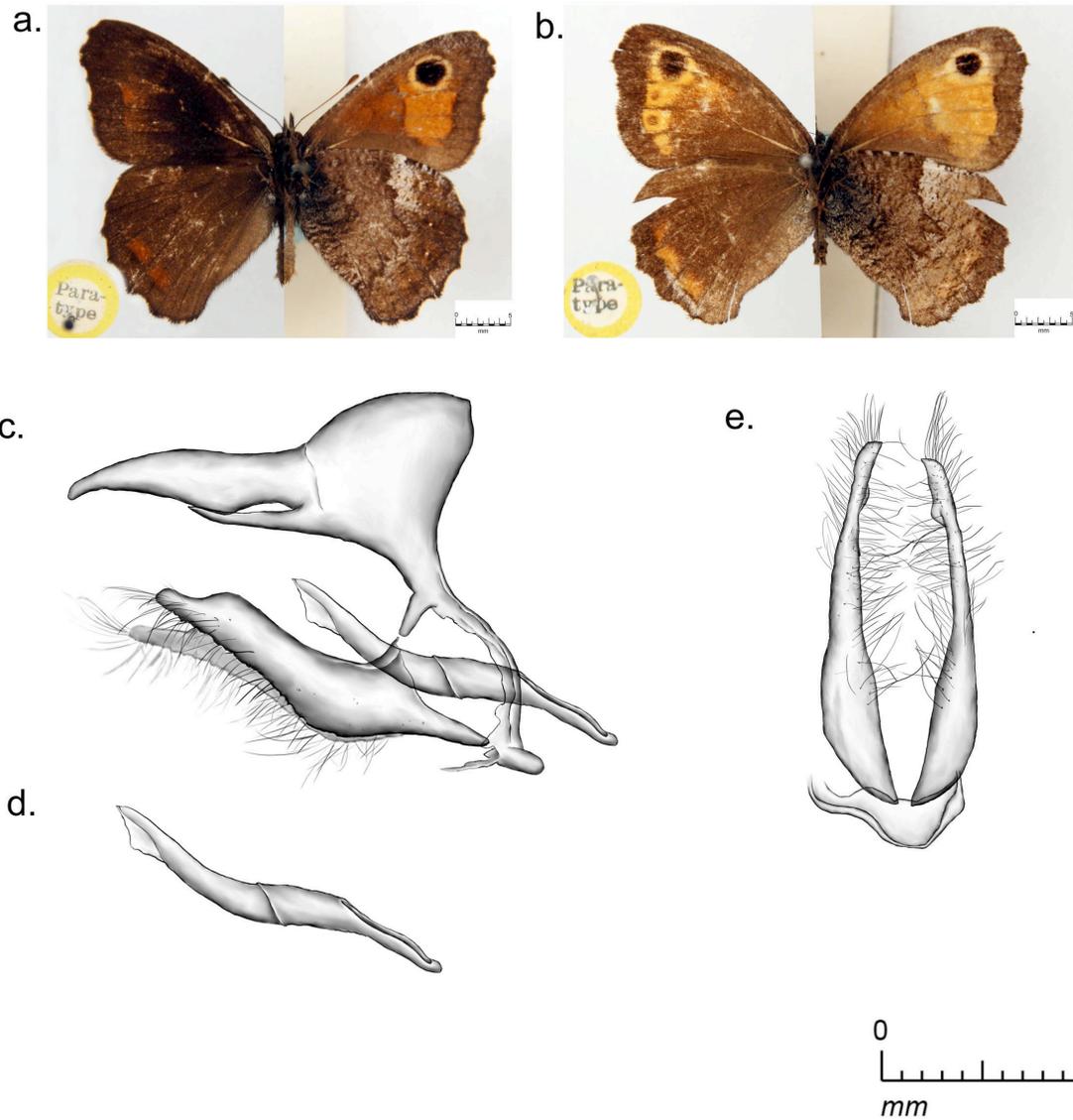


Figure 9-2. (a) Lectotype male dorsal (left) and ventral (right) BMNH#809740, (b) female paralectotype dorsal (left) and ventral (right) BMNH#809739, (c-e) male genitalia from the CU collection

*Neosatyrus* Wallengren, 1858

Type species: *N. ambiorix* Wallengren, 1858

Original descriptions for this genus and *Homoeonympha*, which is combined with *Neosatyrus* here, are very poor and include only a few characters. The species contained herein are often confused with one another and are all plain on the dorsal side with trapezoidal to rectangular hindwings having the termens entire, spatulate antennae, and ocelli that are usually small and yellow or white in each cell between Rs and CuA2. Apical ocellus between M1-M3 on the ventral side of the hindwing is bipupillate and ringed in yellow. Androconia are present in *ambiorix* males but absent in *humilis*, *boisduvalii*, and *shajovskoi*. The distal end of the discal cell is in a wide V shape in all but *shajovskoi*, which is shallowly sinuous. Eyes are naked and the terminal palpal segment may be short and conical or oval as in *boisduvalii* and *shajovskoi* or cylindrical and longer as in *ambiorix* and *humilis*. Males may have one to three foreleg tarsal segments and females of *ambiorix* and *humilis* have four segments in the tarsus. Foreleg tarsal segmentation in the females of *boisduvalii* and *shajovskoi* is unknown. All males have an aedeagus that is hourglass-shaped at the distal end and that of *boisduvalii* and *shajovskoi* bear lateral serrations or dentate projections. Valvae are trapezoidal to triangular at the proximal end and uncus is widest at the base except for in *shajovskoi*, where it is slightly narrower where it joins the tegumen. All are distributed between Valparaíso and northern Los Lagos provinces, Chile.

Specimens of *N. vesagus* were unavailable for thorough study, but are like *boisduvalii* in wing patterning and shape of the hindwing, but without the VHW ocelli. Additionally, *Neomaniola euripides euripides* and *N. euripides salomonis* somewhat resemble *shajovskoi* in wing patterning and other *Neosatyrus* in hindwing shape, but further evidence is necessary to determine whether these taxa truly belong in *Neosatyrus* or another genus.

*Neosatyrus ambiorix* Wallengren, 1858

Type location: Valparaiso, Valparaiso province Chile

Holotype: NRM (photo examined)

= *Neosatyrus minimus* Butler, 1881

Type location: probably Valparaiso, Valparaiso province, Chile

Holotype: (male) BMNH #809621 (specimen examined)

Discussion: Butler (1881) notes that *N. ambiorix* is common near Valparaíso among “arborescent grass” referred to as coligné, which I take to be a species of *Chusquea* bamboo that can be found on the shrubby hillsides in this area.

Diagnosis: Similar to and sometimes confused with *Homeonympha humilis*, but with the hindwing ocelli between M3-CuA1 and CuA1-CuA2 larger and distinctly ringed in yellow or taupe. Males bear androconia on the forewing.

Foreleg tarsi with two segments in the males and four in the females. Genitalia are very similar to *H. humilis*, but with valvae slightly narrower at the distal end.

Head: Antennae 7-8mm with white scales and a longitudinal stripe of dark chocolate scales that cover half of a spatulate club. Smaller specimens may have antennae as short as 5mm. Eyes round and naked, length approximately 1.2 times width. Palps with a longitudinal white stripe along the median, male palps covered with black and warm medium brown scales and females with cream and medium brown scales. Terminal palp segment cylindrical and about one-third the length of the second segment.

Thorax of the males dark amber with iridescent black scales and covered in taupe piliform scales. Females the same, but with the addition of cream and cream piliform scales. Abdomen taupe and rust orange in both sexes. Foreleg tarsi with two segments in the males and four in the females. Midlegs and hindlegs with four rows of black spines on the tibia and tarsus.

Forewing: Wingspan 20-24mm. Smaller specimens may be 16mm. Termen nearly straight and the distal end of the discal cell widely V-shaped. Males with androconial patches in each cell between M1 and the inner margin with a small patch inside the discal cell along the cubitus. Dorsal side chocolate to dark chocolate brown with the fringe scales the same color and a rust red to rust orange patch over the discal cell. Veins sometimes highlighted in rust red to rust orange to just past the median, returning to brown toward the termen. Ventral side warm medium brown to chocolate with a patch of rust orange to rust

red from the discal cell to just past the median, overlapping the postmedian band. Postmedian band edged in dark chocolate, but not otherwise marked. Apical ocellus is round, black, bipupillate, ringed in daffodil yellow to rust orange, and spans M1-M3

Hindwing: Wing rectangular, termen nearly straight and entire. Dorsal side and fringe scales similar in color to the forewing, but without the patch of rust orange or rust red over the discal cell. Long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side warm medium brown to chocolate with a postmedian band sometimes demarcated by a nearly straight or slightly irregular dark chocolate line on either side of the ocelli. Often neither line bordering the postmedian band or only the most distal is visible. Each ocellus between Rs-M1, M1-M2, M2-M3, and CuA2-1A+2A appears as a round white spot, occasionally surrounded with a round patch of black scales or ringed in taupe to daffodil yellow. Rs-M1 ocellus is sometimes absent. Ocelli between M3-CuA1 and CuA1-CuA2 are round, larger, black, unipupillate, and ringed in taupe to daffodil yellow.

Male genitalia: Uncus wide at the base, narrowing from the median to the distal end and curving dorsally into a hook. Uncus about the same length or slightly shorter than the tegumen. Gnathos acute and a little less than two-thirds the length of the uncus. Pedunculus U-shaped. Saccus U-shaped and about four-fifths the length of the gnathos. Valvae widest at the median, narrowing to a rounded acute triangle at the proximal end and to a finger-like distal terminus.

Aedeagus hourglass-shaped at the distal half, the proximal half wider with a truncate terminus.

Distribution: Found in Chile, primarily in southern Valparaíso and Western Santiago Metropolitan provinces. Specimens have also been found in northern Los Lagos and southern O'Higgins province. Flies from December to March at 100-1600m above sea level.

Specimens examined: Chile, Valparaíso province, (MTSU) CL1010-CL1018, CL1030; Chile, O'Higgins province, (CU) 1 male; Chile, Los Lagos province, (OSU) 000093664; Chile, unknown province, (BMNH) Holotype *N. minimus* 809621

*Neosatyrus boisduvalii boisduvalii* (Blanchard, 1852) (*Erebia*) n. comb.

Type location: Magallanes province, Chile

Holotype: (male) BMNH? (Photo examined)

= *Neosatyrus hahnii* (Mabille, 1885)

Type location: Santa Cruz province, Argentina

Holotype: (male) MNHN, Paris (Photo examined)

*Neosatyrus boisduvalii pusilla* C. Felder & R. Felder, 1867 n. comb.

Type location: Chile

Holotype: (male) BMNH #809620 (Specimen examined)

Discussion: *N. boisduvalii* (here transferred from *Homoeonympha*) appears to exist in two separate populations, one northern population from Araucanía province, Chile and one southern population in Magallanes province, Chile with few individuals collected in between. The difference between the two subspecies appears to be in the strength of the postmedian band on the ventral side of the hindwing, the nominal subspecies being more clearly defined than *N. boisduvalii pusilla*, but given the dearth of information on the latter, it is impossible to say whether the nominal subspecies and *N. boisduvallii pusilla* correspond with the Araucania province and Magallanes province populations, respectively. Elwes (1903) describes specimens collected from Termas de Chillán with a strong ventral side hindwing band that supposedly correspond with *N. boisduvalii pusilla*, though the type specimen appears to have a very weak postmedian band. His figures appear to be closer to the nominal type, though it is impossible to tell whether the illustration over-emphasizes the hindwing band. He states: "Until we get much more ample material from intermediate localities in the south the specific identity of these forms must remain undecided," which continues to hold true.

Diagnosis: Most similar to *N. humilis*, but with a strong white to lavender postmedian band with a deckle-edged median border on the ventral side of the hindwings and amber spines on the tibia and tarsus of the midlegs and hindlegs. Apical ocellus on the ventral side of the forewing between M1-M3 is usually more distinct in *N. boisduvalii* than in *N. humilis*. Northern distribution of *N. boisduvalii*

overlaps the southernmost part of the distribution of *N. humilis*, the former being found as far south as Magallanes, Chile and both with a similar altitudinal range.

Head: Antennae 6-7mm, covered in white scales with a longitudinal stripe of chocolate scales and terminating in a spatulate club. Eyes oval and naked, length approximately 1.3 times width. Palps white to cream and chocolate brown with the dorsal side bearing more lighter scales than darker scales and the ventral side with more of the darker scales than the lighter scales. Terminal palp segment conical and a little over one-fourth the length of the second segment.

Thorax with iridescent black scales and chocolate piliform scales. Foreleg tarsi with three segments in the males; females were unavailable for study.

Midlegs and hindlegs with four rows of amber spines on the tibia and tarsus.

Forewing: Wingspan 20-26mm. Termen nearly straight to slightly convex and the distal end of the discal cell widely V-shaped. Males with no androconial patch. Dorsal side chocolate brown with fringe scales the same color.

Postmedian band appears between M3-CuA1 and CuA1-CuA2 as a pair of rectangular rust orange patches. Ventral side with a patch of rust orange from the discal cell to the postmedian and a ripple pattern in chocolate brown and white to lavender appears along the costa and termen, the inner margin chocolate brown and more faintly rippled with darker chocolate. Apical ocellus is round, black, bipupillate, ringed in daffodil yellow, and spans M1-M3.

Hindwing: Wing trapezoidal with apex rounded and the termen convex and entire. Dorsal side chocolate with long piliform scales appearing at the base and

over the discal cell, extending to the median and toward the inner margin.

Postmedian band appears between M3-CuA1 and CuA1-CuA2 as barely visible rust orange patches. Fringe scales are as in the forewing. Ventral side chocolate from the base to the postmedian band with dark coffee striations in a ripple pattern over the entire wing and a sinuous dark coffee submedian line.

Postmedian band is deckle-edged and grey to lavender at the median border, fading to chocolate at the center and then to grey to lavender along the termen. A small, round, daffodil yellow ocellus appears in each cell between Rs and CuA2, the M3-CuA1 ocellus slightly larger. Ocelli between Rs and M2 may be obscured or absent.

Male genitalia: Uncus wide at the base, narrowing a blunt end and about 1.4 times longer than the tegumen. Gnathos wide, about half the width of the uncus where both join the tegumen, and three-fifths the length of the uncus. Pedunculus short and U-shaped. Saccus U-shaped and about half the length of the gnathos. Valvae widest at the median, narrowing abruptly to half the width proximally and then gradually to a blunt acute proximal end. Distal half of the valva is triangular with short length of serration dorsal side just distal to the median. Aedeagus widest and rectangular at the proximal one-third, narrowing abruptly to about two-thirds the width and then narrowing gradually toward the distal end. Median one-third of the aedeagus bears lateral serrations.

Distribution: Can be found in Chile from southern Bío Bío province to the westernmost border of Río Negro province in Argentina and in Magallanes

province, Chile from October to January at nearly sea level to 1800m above sea level.

Specimens examined: *N. boisduvalii boisduvalii* Chile, Magallanes province, (BMNH?) Holotype male (photo examined), (UJ) 2 males, 2 females, (MGCL) 1 male; Argentina, Rio Negro province, (UJ) 1 male; Argentina, Chubut province, (BMNH) 809785; Argentina, Santa Cruz province, (MNHN, Paris) Holotype *N. hahnii* male; *N. boisduvalii pusilla* Chile, unknown province, (BMNH) male 809620

*Neosatyris humilis* (C. Felder & R. Felder 1867) (*Stygnus*) n. comb.

Type location: Valdivia, Los Rios province, Chile

Lectotype: (male) BMNH #809786 (specimen examined)

Paralectotype (male) BMNH #809783 (specimen examined)

= *Homoeonympha persephone* (Reed, 1887) (*Satyris*) nom. nud

= *Homoeonympha simplex* (Bryk, 1944) (*Erebina*)

Type location: Lago Nahuel Huapí, Rio Negro province, Argentina

Holotype: (male) NRM, Stockholm (photo examined)

Discussion: There are two specimens in the British Museum that are labeled as the type specimen of *N. humilis* and I have designated the specimen labeled "Valdivia" as the lectotype. This species is probably the most

misidentified of the *Neosatyriti*, and has been labelled in collections as *N. ambiorix*, *C. stelligera*, and *T. leucoglène*. Likewise, these and *N. shajovskoi* have been mistaken for *N. humilis*. It is fairly nondescript and common near wooded areas.

Diagnosis: Most similar to *Neosatyritus ambiorix*, but with the ocelli between M3-CuA1 and CuA1-CuA2 much reduced. Male foreleg tarsi are unsegmented and male forewings are without visible androconia. Genitalia are very similar to *N. ambiorix*, but with valvae slightly wider at the distal end. Head: Antennae 7-8mm, covered in white scales with a longitudinal stripe of chocolate to dark chocolate scales that cover half of a spatulate club. Eyes round and naked, length approximately 1.2 times the width. Palps white to cream with coffee brown piliform scales in the females and black, white, and taupe in the males. Terminal palp segment is cylindrical and approximately three-fifths the length of the second segment.

Thorax dark amber with iridescent black scales and cream to chocolate piliform scales in the males and white and iridescent black with cream and coffee brown piliform scales in the females. Foreleg tarsi with four segments in the females and unsegmented in the males. Male forelegs may be constricted, but not segmented in one or two locations, giving the appearance of segmentation. Midlegs and hindlegs with four rows of black spines on the tibia and tarsus.

Forewing: Wingspan 20-26mm. Termen nearly straight to slightly convex and the distal end of the discal cell widely V-shaped. Males with no androconial

patch. Dorsal side chocolate to dark chocolate brown with fringe scales the same color. Females may have a rust orange patch over the discal cell that extends to the median. Ventral side lighter than the dorsal side, both sexes with a rust orange to rust red patch over the discal cell that extends to the median and into the postmedian band. Postmedian band edged in dark chocolate to dark coffee brown, but not otherwise marked. Apical ocellus is round, black, bipupillate, ringed in daffodil yellow, and spans M1-M3. Ocellus may appear as two separate ocelli that fuse at M2 and the yellow ring may be circumscribed in dark chocolate brown in the females.

Hindwing: Wing rectangular, termen nearly straight and entire. Dorsal side chocolate to dark chocolate brown. Long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side lighter than the dorsal side with a small, white, round ocellus in each cell between Rs and 1A+2A. Ocelli between M3-CuA1 and CuA1-CuA2 are weakly ringed in black. Rs-M1 ocellus is sometimes absent.

Male genitalia: Uncus wide at the base, narrowing from the median to the distal end and curving ventrally into a hook. Uncus about the same length or slightly shorter than the tegumen. Gnathos acute and a little less than two-thirds the length of the uncus. Pedunculus U-shaped. Saccus widely U-shaped and about the same length as the gnathos. Valvae widest at the median, narrowing gradually to a blunt proximal end and narrowing slightly toward the distal end to a

deltoid terminus. Aedeagus hourglass-shaped at the distal half, the proximal half wider with a truncate terminus.

Distribution: Can be found in Chile from Bío Bío province to northern Los Lagos province from December to February at nearly sea level to 1600m above sea level.

Specimens examined: Chile, Maule province, (MTSU) CH16-1, (MGCL) 1 male; Chile, Bío-Bío province, (OSU) 000095099, (MTSU) CL0202, CL0203, CL0301, CL0307, CL0308, CL0401-CL0404, (CU) 1 female; Chile, Araucanía province, (OSU) 000093665, 000093667, 000093676, 000095055, 000095155, (MTSU) CH40-5, CH41-1, (MGCL) 1 male; Chile, Los Ríos province, (BMNH) Lectotype *Neosatyris humilis* male 809786; Chile, Los Lagos province, (OSU) 000093664, 000093673, 000095034, (MTSU) CH10-4, CH10B-3, CH10B-8, CH10B-9, (MGCL) 1 male; Chile, unknown province, (CU) 1 male; Argentina, Neuquén/Río Negro province, (NRM) 1 male (photo examined); Unknown locality, Paralectotype *Neosatyris humilis* male 809783

*Neosatyris shajovskoi* Hayward, 1954 (*Homoeonympha*) n. comb.

Type Location: Pucará, Lago Nonthué, Neuquén province, Argentina 5-24 Nov. 1952

Holotype: (male) FML, Tucumán (photo examined)

Allotype: (female) FML, Tucumán (not examined)

Paratypes: (17 males, 9 females) FML, Tucumán (not examined); (female) BMNH 809575 (specimen examined); (1 male, 1 female) Hua Hun, Lago Nonthué, Neuquen province, Argentina, 8 Nov 1946, FML, Tucumán (not examined); (6 males, 4 females) Correntoso, Nahuel Huapí, Rio Negro province, Argentina, Jan. 1936 (not examined)

Diagnosis: Most similar to *Homoeonympha pusilla*, but slightly larger, darker, with the ocellus or ocelli on the ventral side of the forewing much reduced, and without a distinct red patch over the discal cell. Postmedian band on the ventral side of the hindwing without a distinct border and maize yellow to lavender. Dark coffee striations superimposed over the entire hindwing in a ripple pattern. A distinct round yellow ocellus appears in each cell between Rs and CuA2. Aedeagus hourglass-shaped at the distal half, the more proximal part edged in dentate projections. Proximal half of the aedeagus wide and truncate.

Head: Antennae 7-8mm, covered in cream scales and a longitudinal stripe of chocolate to dark chocolate scales that cover half of a spatulate club. Eyes round and naked, length approximately 1.1 times width. Palps dark chocolate brown with sparse cream scales on the ventral side. Terminal palp segment oval and a little less than one-third the length of the second segment.

Thorax nearly black with iridescent black scales and covered in coffee piliform scales. Foreleg tarsi club-like and unsegmented in the males. Females

were unavailable for study. Midlegs and hindlegs with four rows of amber spines on the tibia and tarsus.

Forewing: Wingspan 26-32mm. Termen nearly straight to slightly convex and the distal end of the discal cell a shallow S-curve. Males with no visible androconial patch. Dorsal side dark chocolate brown with fringe scales in the same color. According to the original species description, females may either be plain as in the males or have indistinct red patches along the postmedian band and an ocellus that mirrors that which is found on the ventral side, presumably the M1-M2 ocellus. Ventral side is dark chocolate brown and the M1-M2 ocellus may appear as a small black dot, but may also bear a single ocellus or be ringed in rust red. Another ocellus sometimes appears between M2-M3 and may be fused with the M1-M2 ocellus. Apex may bear a lavender patch with dark coffee striations in a ripple pattern.

Hindwing: Wing trapezoidal, termen slightly convex and entire. Dorsal side and fringe scales similar in color to the forewing and long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side chocolate to dark chocolate brown with dark chocolate to dark coffee striations in a ripple pattern. Postmedian band maize yellow to lavender superimposed with dark coffee striations, without distinct borders and extending to the termen. A single small, round, maize yellow ocelli present in each cell from Rs to CuA2.

Male Genitalia: Uncus slightly narrower at the base than at the median and narrowing to a blunt finger-like terminus. Uncus approximately 1.3 times the length of the tegumen. Gnathos acute and approximately four-tenths the length of the uncus. Pedunculus short and blunt. Saccus truncate and approximately two-thirds the length of the gnathos. Valvae widely trapezoidal at the proximal end, narrowing abruptly to one-third the width of the widest part of the valva with the distal two-thirds even in width and ending in an acute triangular terminus. Aedeagus truncate at the proximal end and wide, narrowing at the median to a little less than half the width, the distal half approximately hourglass-shaped, the more proximal part slightly wider and flanked with acute dentate projections along each lateral edge.

Distribution: Can be found in Chile from southern Araucanía province to northern Los Lagos province and in Argentina in southwestern Neuquén province near the Chilean border from November to January at 100-800m above sea level.

Specimens examined: Chile, Araucanía province, (MGCL) 1 male; Chile, Los Lagos province, (MTSU) CH10B-7, (UJ) 1 male, (OSU) 000093357; Argentina, Tucumán province, (FML) Holotype male (photo examined); Argentina, unknown province, (BMNH) Paratype female 809575

*Neosatyrus ambiorix* Wallengren, 1858

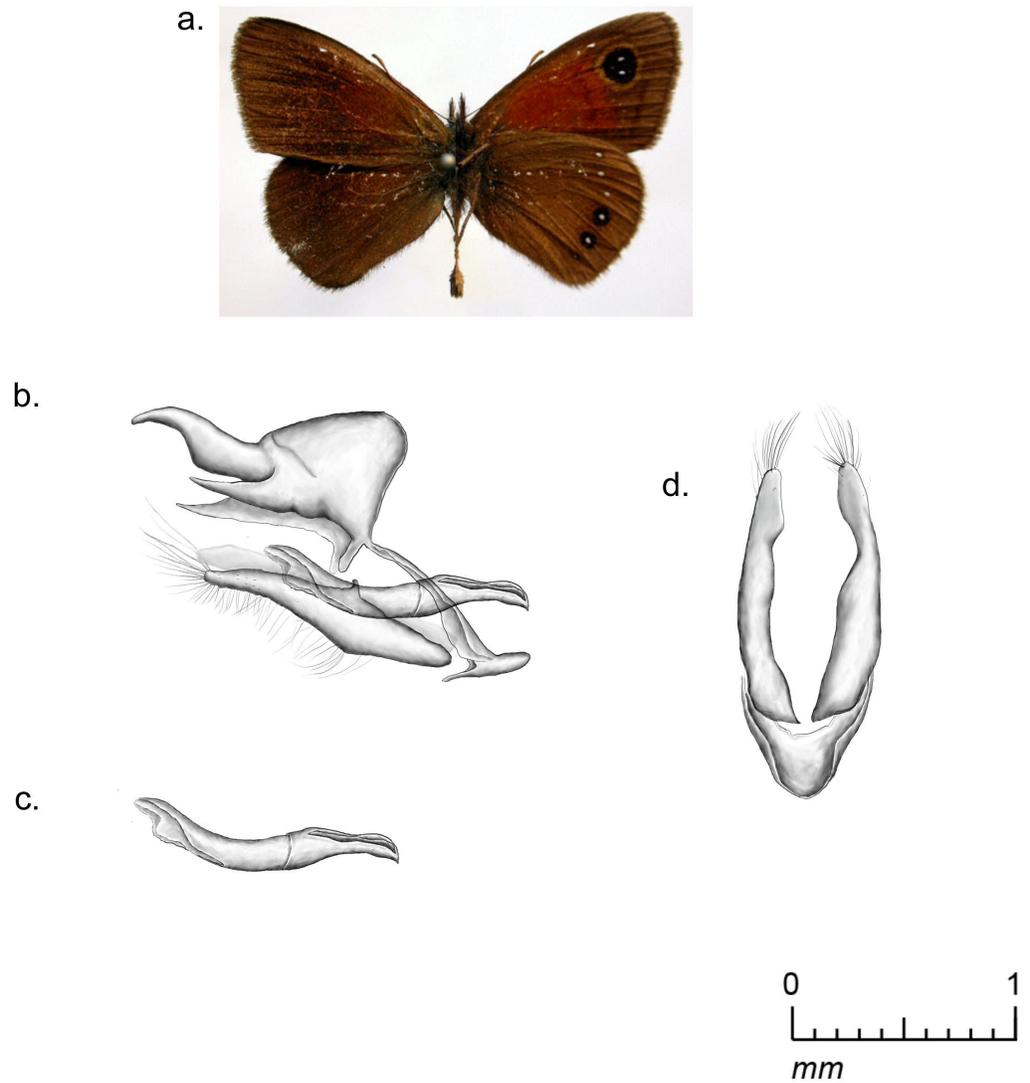


Figure 10-1 (a) Male holotype dorsal (left) and ventral (right) from the NRM collection, (b-d) male genitalia from the UJ collection

*Neosatyrus boisduvalii* (Blanchard, 1852) (*Erebia*) n. comb.

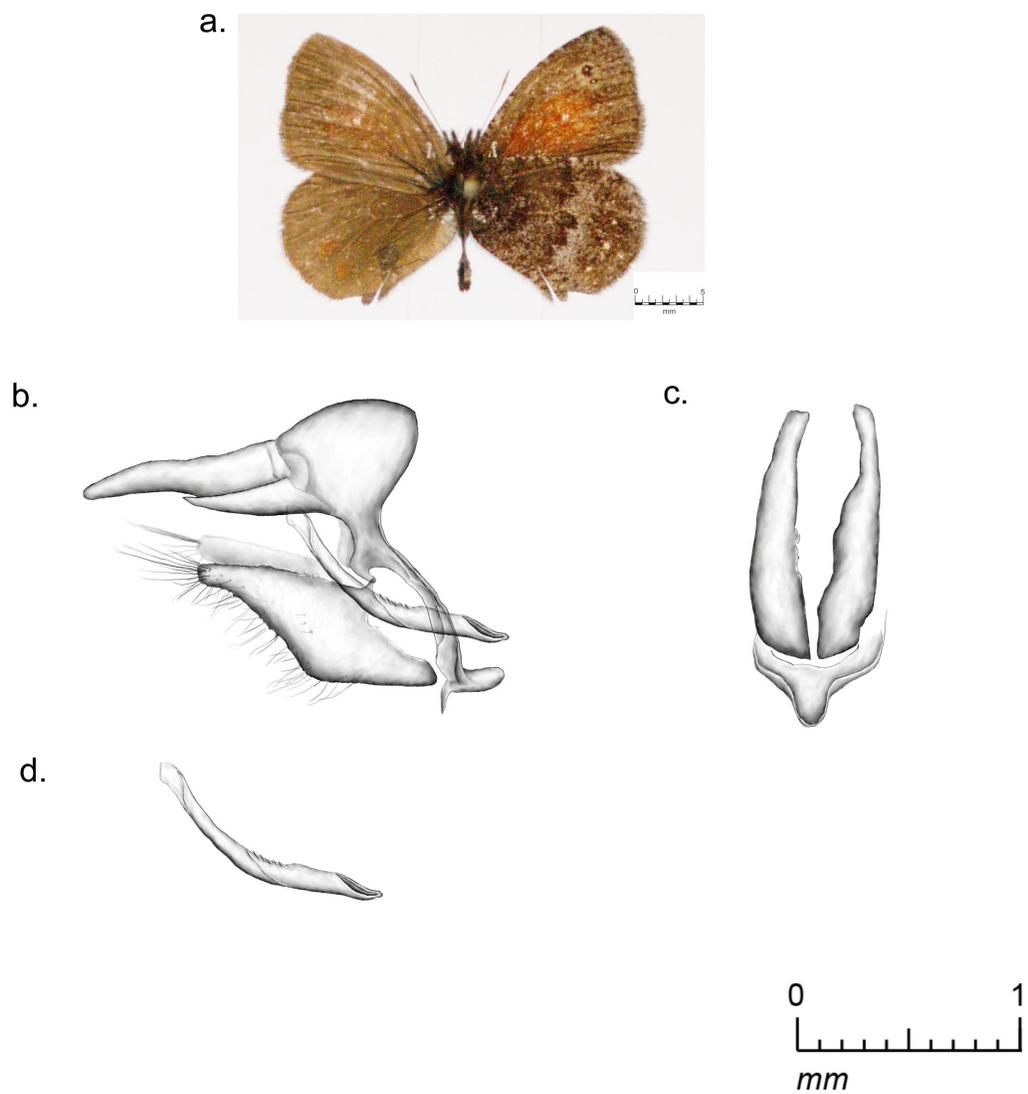


Figure 10-2. (a) Male dorsal (left) and ventral (right) and (b-d) male genitalia from the UJ collection

*Neosatyus humilis* (C. Felder & R. Felder, 1867) (*Stygnus*) n. comb.

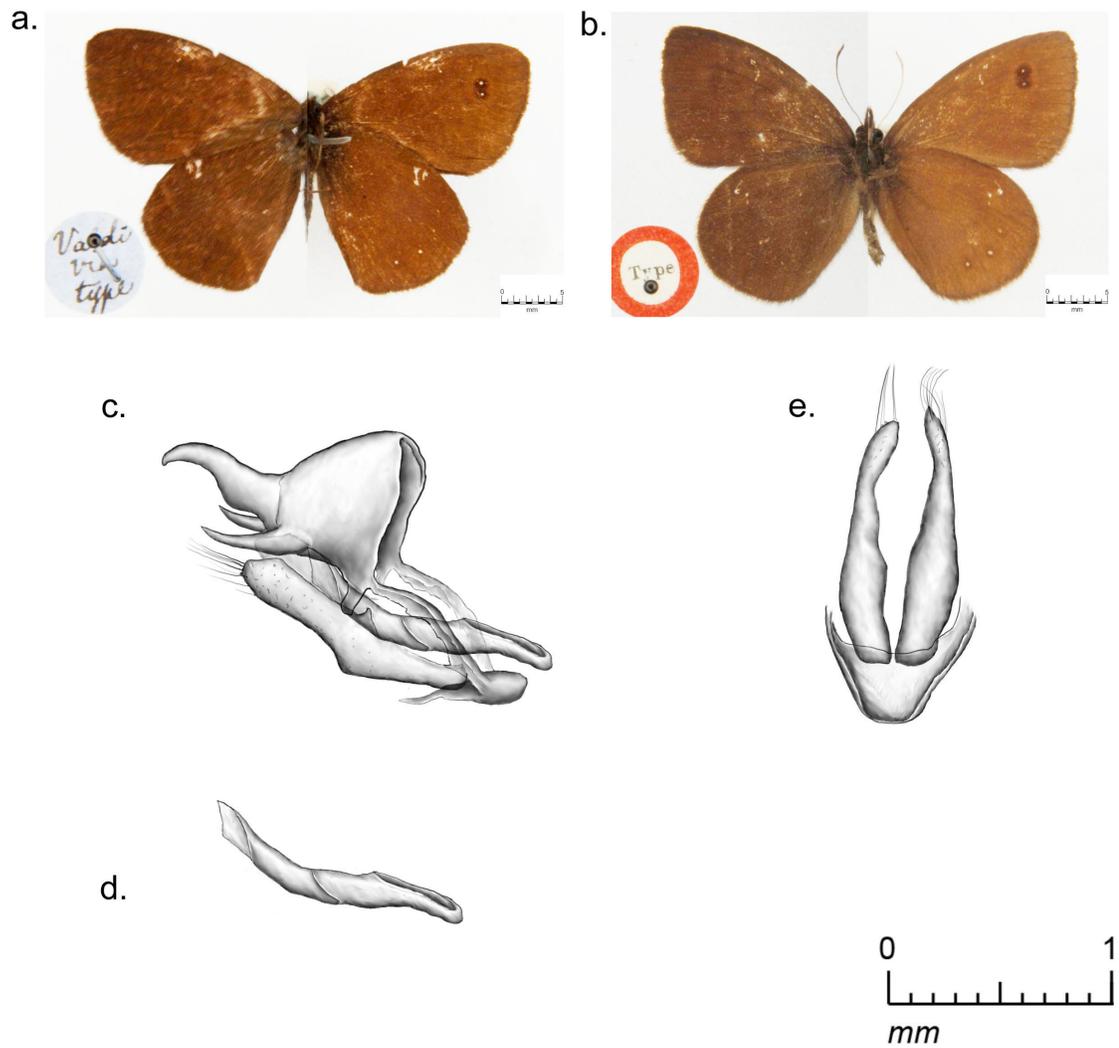


Figure 10-3. (a) Male lectotype dorsal (right) and ventral (left) BMNH#809786, (b) male paralectotype dorsal (right) and ventral (left) BMNH#809783, and (c-e) male genitalia CH40-5

*Neosatyrus shajovskoi* (Hayward, 1954)(*Homeonympha*) n. comb.

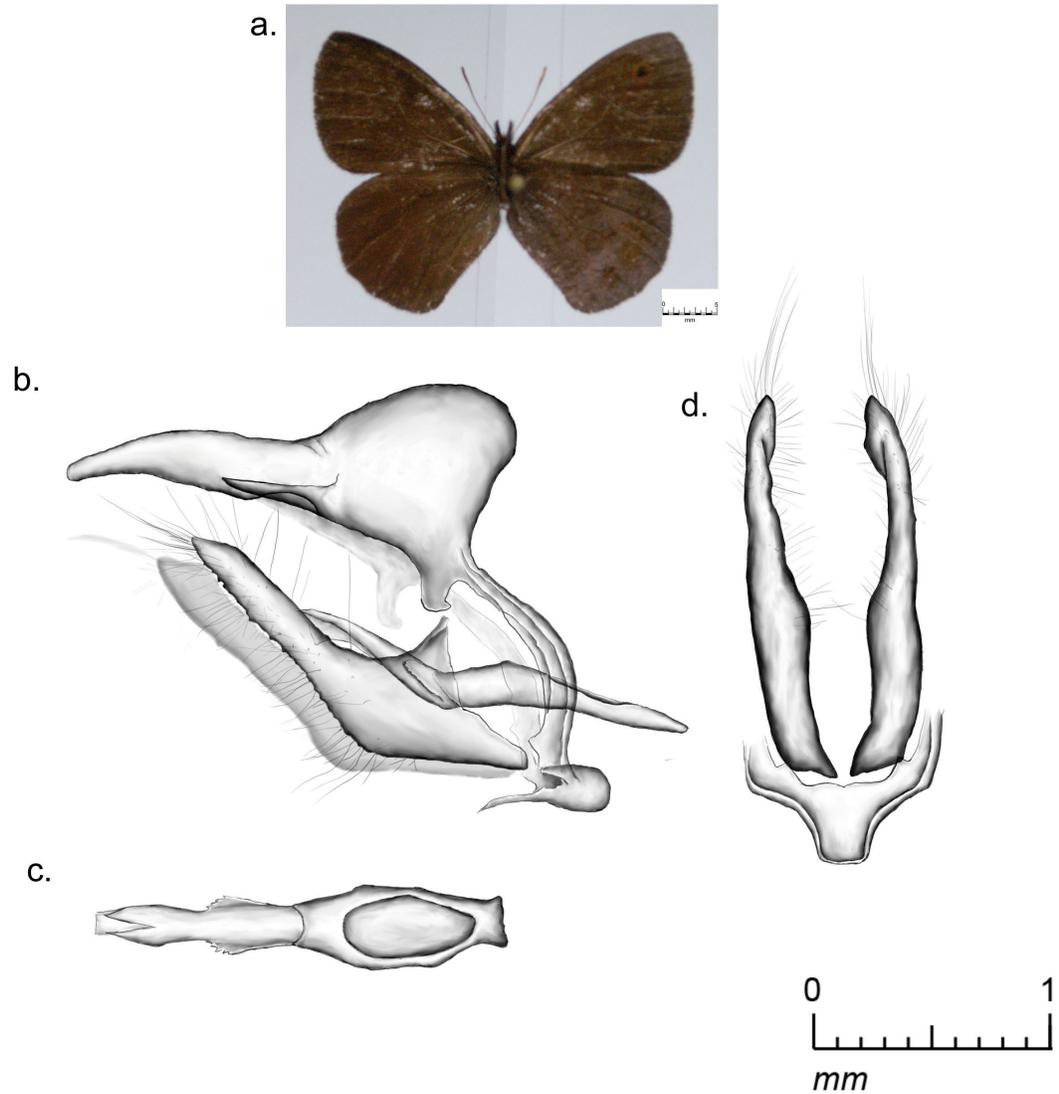


Figure 10-4. (a) Male dorsal (left) and ventral (right) and (b-d) male genitalia from UJ collection, (c) showing ornamentation on the aedeagus

*Tetraphlebia* C. Felder & R. Felder, 1867

Type species: *T. germainii* C. Felder & R. Felder, 1867

= *Faunula* C. Felder & R. Felder, 1867 syn. nov.

Felder and Felder described *Faunula* as a new genus immediately following the description of *Tetraphlebia*, noting similarities in wing venation between the two genera. These genera have been combined based on morphological and genetic similarity. *Tetraphlebia* has a well-developed M1-M3 ocellus on the ventral side of the forewing with variable pupillation. In *T. leucoglène*, males have heavy androconia, but these scales are sparse in *T. germainii* and absent in *T. eleates*. The hindwing is rectangular with a postmedian band on the ventral side that is without ocelli. Though specimens were unavailable for thorough study, *T. patagonica*, originally a species of *Faunula*, is very similar to *leucoglène* in that it bears an identical M1-M3 VFW ocellus with a large, white pupil, but *patagonica* also bears two ocelli on the VHW, making it the only *Tetraphlebia* with hindwing ocelli. Antennae are round in *eleates* and *leucoglène*, spatulate in *germainii*. Eyes are naked and terminal palp segment is short and conical or oval. Foreleg tarsi are segmented with males having 2-3 tarsal segments and females 3-5 segments, those of *leucoglène* females also bearing spines. Male genitalia with the proximal end of the valvae triangular, a wide pedunculus, an aedeagus that is truncate at the

proximal end, a saccus longer than it is wide, and an uncus that is widest where it meets the tegumen, narrowing gradually toward the distal end.

*Tetraphlebia germainii germainii* C. Felder & R. Felder, 1867

Type location: Chile

Holotype: (male) BMNH #809771 (specimen examined)

= *Epinephiele promacuana* Reed, 1877

*Tetraphlebia germainii argentina* Hayward, 1962

Diagnosis: Easily distinguished from other species by the bold white postmedian band on the ventral side of the hindwing. Larger than *T. leucoglène*, with spatulate antennal clubs, a bipupillate apical ocellus between M1-M3 on the ventral side of the forewing, and the androconia more sparse on the male forewings. Male genitalia similar to those of *T. eleates*.

Head: Antennae 8-9 mm with chocolate brown scales and a longitudinal stripe of white scales, terminating in a spatulate club. Eyes oval and naked, length approximately 1.3 times the width. Palps almost entirely tan with chocolate to dark chocolate piliform scales that are lighter toward the base. Terminal segment conical and about one-sixth the length of the second segment. Thorax with tan to dark chocolate scales and tan to chocolate piliform scales. Foreleg tarsi with three segments in the males, female tarsi unavailable for study. Midlegs and hindlegs with four rows of black spines on the tibia and tarsus.

Forewing: Wingspan 30-40 mm. Termen nearly straight to slightly convex and the distal end of the discal cell L-shaped. Males with a sparse rectangular androconial patch that extends from R5 into the distal end of the discal cell and just past CuA2, sometimes to the inner margin. Dorsal side chocolate to dark chocolate brown with the fringe scales in chocolate. Postmedian band appears as a rust orange to rust red patch from M3-CuA2. Females may have a small white ocellus between M1-M2. Ventral side similar in color to the dorsal side with a rust orange to rust red patch extending from the center of the discal cell into the postmedian band. The postmedian band is edged in dark chocolate deckle-edged to nearly straight borders and is lighter than the rest of the wing, chocolate brown toward the costa and inner margin and rust orange to rust red from M1 to just past CuA2. A patch of white scales extends in a ripple pattern with chocolate brown striations over the radials and apex. Apical ocellus is round, black, ringed in daffodil yellow, bipupillate, and extends from M1-M3.

Hindwing: Wing rectangular, termen straight to slightly convex and entire. Dorsal side similar in color to the forewing with the postmedian band appearing in a lighter brown with a patch of rust orange to rust red between M3-CuA2. Fringe scales are as in the forewing and long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side darker than the ventral side of the forewing and with a ripple pattern in dark chocolate to dark coffee that extends over most of the wing. Postmedian band appears in white to pale lavender, solid at the median half and fading to

chocolate brown in the subterminal half. Borders of the postmedian band are deckle-edged to nearly straight and dark chocolate to dark coffee.

Male genitalia: Uncus wide at the base, narrowing gradually to an acute terminus, and slightly shorter than the tegumen. Gnathos acute and about three-fifths the length of the uncus. Pedunculus deltoid and wide. Saccus U-shaped and about equal in length to the gnathos. Valvae roughly in the shape of a flattened rhomboid, widest at the median with the distal end rounded. Aedeagus nearly even in width throughout with the proximal end about twice as wide as the median and truncate.

Distribution: Can be found in Chile from eastern Bío-Bío province near Termas de Chillán southward to northeast Araucanía province from late December to late February at 1000-1600m above sea level.

Specimens examined: Chile, Bío-Bío province, (CU) 2 males, (UJ) 1 female; Chile, unknown province (BMNH) Holotype male #809771

*Tetraphlebia eleates* (Weymer, 1890) (*Pseudomaniola*) n. comb., n. stat.

Type location: Tacora, Potosi province Bolivia

Holotype: (male) MFN, Berlin, genitalia vial M-9009 Lee D. Miller, 3042 (photo examined)

Diagnosis: Most similar to *T. leucoglène*, but generally a little lighter in color and with the apical ocellus on the ventral side of the hindwings much

reduced. This ocellus is completely contained within M1-M2 and the pupil is a small white point at the center. Males are without androconia visible on the forewing and male genitalia have a narrower uncus, wider gnathos, and a tegumen wider along the dorsoventral side axis than in *T. leucoglène*. Valvae are deltoid at the distal end in *T. eleates* and rounded at the distal end in *T. leucoglène*. Specimens found in Bolivia at high altitudes are more likely to be *T. eleates* while *T. leucoglène* is found in Chile much farther south and at lower altitudes.

Head: Antennae 6-7mm with dark chocolate scales and a longitudinal stripe of white scales, terminating in a round club. Eyes round and naked, length approximately 1.2 times width. Palps chocolate brown with dark chocolate piliform scales in the males and in the females tan to chocolate with chocolate piliform scales on the dorsal side and dark chocolate to black piliform scales on the ventral side. Terminal segment conical and about one-eighth the length of the second segment. Thorax with iridescent black scales and chocolate to dark chocolate piliform scales in the males and the females with white and iridescent black scales and chocolate piliform scales. Foreleg tarsi with two segments in the males and three segments in the females. Midlegs and hindlegs with four rows of amber spines on the tibia and tarsus.

Forewing: Wingspan 20-22mm. Termen slightly convex to nearly straight and the distal end of the discal cell sinuate with the cubital end straighter than the radial end. Males with no visible androconial patch. Dorsal side chocolate to dark

chocolate brown, the males darker. Postmedian band appears in both sexes as a pair of rust orange patches between M3-CuA1 and CuA1-CuA2 with another patch sometimes appearing between M2-M3. Fringe scales are chocolate to dark chocolate. Ventral side similar in color to the dorsal side. Postmedian band rust orange and broken by the veins in some specimens, widest where it surrounds the M1-M2 ocellus, and narrowing toward the tornus. Borders of the postmedian band are dark chocolate to dark coffee and irregularly scalloped. Apical ocellus is entirely contained within M1-M2, round, black, ringed in rust orange, and with a single small white pupil at its center.

Hindwing: Wing rectangular, termen slightly convex and entire. Dorsal side similar in color to the forewing with the postmedian band visible as an obscure rust orange patch between M3-CuA2. Fringe scales are as in the forewing and long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side similar in color to the dorsal side. Postmedian band lighter brown than the rest of the wing with both proximal and distal edges dark chocolate to dark coffee brown and scalloped.

Male genitalia: Uncus widest at the base, narrowing to an acute terminus and a little longer than the tegumen. Gnathos acute and almost three-fifths the length of the uncus. Pedunculus deltoid and wide. Saccus U-shaped and about equal in length to the gnathos. Valvae widest at the median, narrowing proximally to an acute triangle and narrowing slightly toward the distal end and a deltoid

terminus. Aedeagus widest and truncate at the proximal end, narrowing gradual toward the distal end.

Distribution: Can be found in Bolivia throughout Potosi Department from October to December at 4000-5000m above sea level.

Specimens examined: Bolivia, Potosi department, (CU) 1 male, 1 female

*Tetraphlebia leucoglene* (C. Felder & R. Felder, 1867) (*Faunula*) n. comb.

Type location: Chile

Holotype: BMNH #809770 (specimen examined)

= *Satyrus hypsophila* Reed, 1877 nomen nudum

Diagnosis: Similar to *T. patagonica*, but without ventral side hindwing ocelli. Both dorsal side and ventral side chocolate to dark coffee brown with a slightly lighter brown postmedian band on the ventral side of the hindwing. Apical ocellus on the ventral side of the forewing is black and spans M1-M3, bearing a large, round, white pupil between M1-M2. Females have a white ocellus on the dorsal side of the forewing between M1-M2 similar to the white pupil on the ventral side. Males have heavy androconia in a wide stripe along the median of the forewing. Antennal clubs round and palps with a short, oval terminal segment. Foreleg tarsi with five segments in the females and three in the males. Head: Antennae 7-8mm with dark coffee scales and a longitudinal stripe of white scales, terminating in a round club. Eyes round and naked, length approximately

1.2 times width. Palps cream to vanilla with coffee ventral side piliform scales in the females. Males with taupe to coffee palps. Terminal segment oval and about one-sixth the length of the second segment.

Thorax with iridescent black scales and coffee piliform scales. Abdomen taupe ventrally to dark chocolate dorsally. Foreleg tarsi with five segments in the females and three in the males. Female tarsi bear a pair of dark amber spines at each joint. Midlegs and hindlegs with four rows of black spines on the tibia and tarsus.

Forewing: Wingspan 24-28 mm. Termen slightly convex and the distal end of the discal cell sinuous. Males with a heavy androconial patch that extends from R5 to just past CuA2 and into the discal cell from the cubitus nearly to M2. Dorsal side dark chocolate to dark coffee brown, the females lighter than the males with the fringe scales chocolate brown. Females with a white ocellus between M1-M2 that may be surrounded by a patch of dark chocolate scales. Postmedian band appears in lighter specimens as two patches of rust orange between M3-CuA1 and CuA1-CuA2. Ventral side similar in color to the dorsal side with the postmedian band appearing as a lighter brown to rust orange triangle surrounding the M1-M2 ocellus that is widest at the costa and terminates at CuA1. Apical ocellus is round and black, extending from M1-M3 and with a single, large, white pupil between M1-M2.

Hindwing: Wing rectangular, termen straight to slightly convex and entire. Dorsal side similar in color to the forewing with the postmedian band visible in

lighter specimens as patches of rust orange between M3-CuA1 and CuA1-CuA2. Fringe scales are as in the forewing and long piliform scales appear at the base and over the discal cell, extending to the median and toward the inner margin. Ventral side similar in color to the dorsal side. Postmedian band lighter brown than the rest of the wing with the proximal edge scalloped and the distal edge indistinct, extending to the termen.

Male genitalia: Uncus wide at the base, narrowing to an acute terminus, and about equal in length to the tegumen. Gnathos acute and a little more than half the length of the uncus. Pedunculus U-shaped and wide. Saccus U-shaped and about equal in length to the gnathos. Valvae widest at the median, narrowing toward the proximal end, forming an acute triangle and narrowing slightly toward the distal end, terminating in a U-shape. Aedeagus nearly even in width throughout, the proximal end slightly wider with a truncate terminus.

Distribution: Can be found in Chile from southeastern Atacama province south to northeast Araucanía province and in Argentina from northern La Rioja province to Northwestern Chubut province from December to early March at 900-3850m above sea level. They can be caught near exposed rocky areas, but can be difficult to approach (Elwes 1903).

Specimens examined: Chile, Coquimbo province, (MGCL) 1 male, 1 female; Chile, Valparaiso province, (OSU) 000093692, 000095029, (MTSU) CH30-1, CH30-3, CH30-5; Chile, Santiago Metropolitan province, (OSU) 000095028, 000095033; Chile, unknown province, (BMNH) Holotype 809770

*Tetraphlebia germainii* C. Felder & R. Felder, 1867

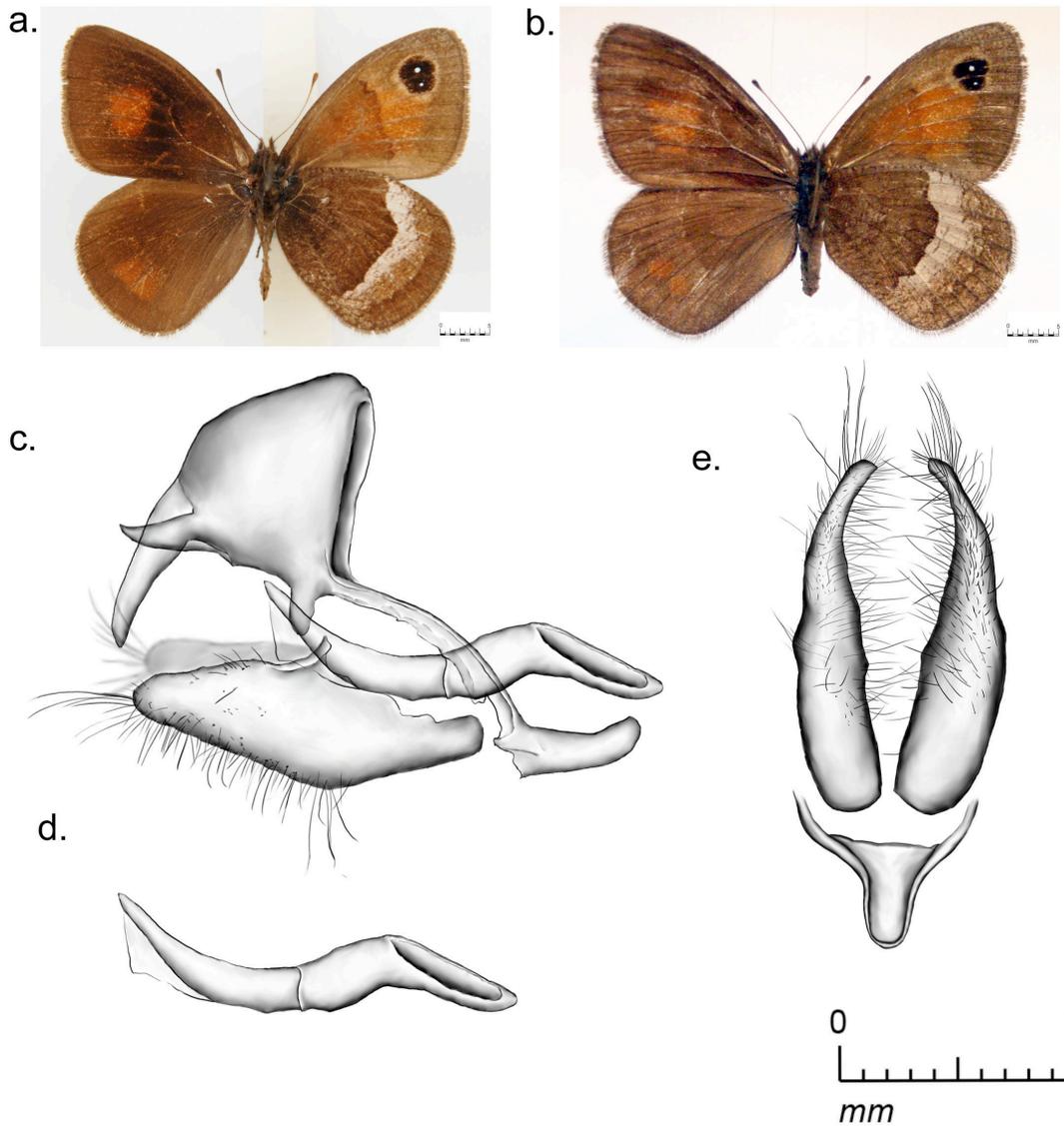


Figure 11-1. (a) Male dorsal (left) and ventral (right) BMNH#809472, female dorsal (left) and ventral (right) from the UJ collection, and (c-e) male genitalia from the CU collection (c) showing a bent uncus from spasms occurring at death

*Tetraphlebia eleates* (Weymer, 1890) (*Pseudomaniola*) n. comb.

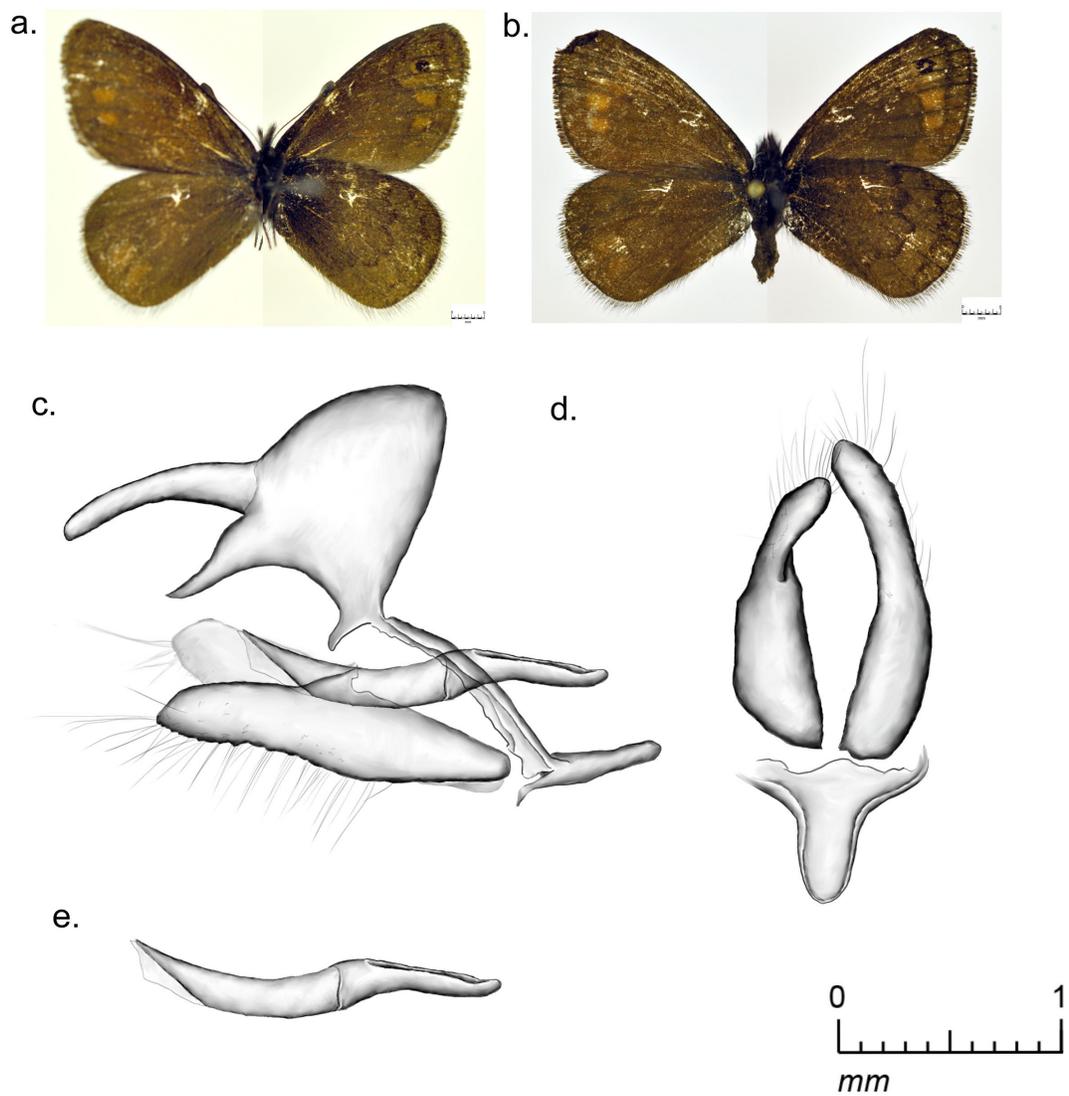


Figure 11-2. (a) Male dorsal (left) and ventral (right), (b) female dorsal (left) and ventral (right), and male genitalia from the CU collection

*Tetraphlebia leucoglene* (C. Felder & R. Felder, 1867) n. comb. (*Faunula*)

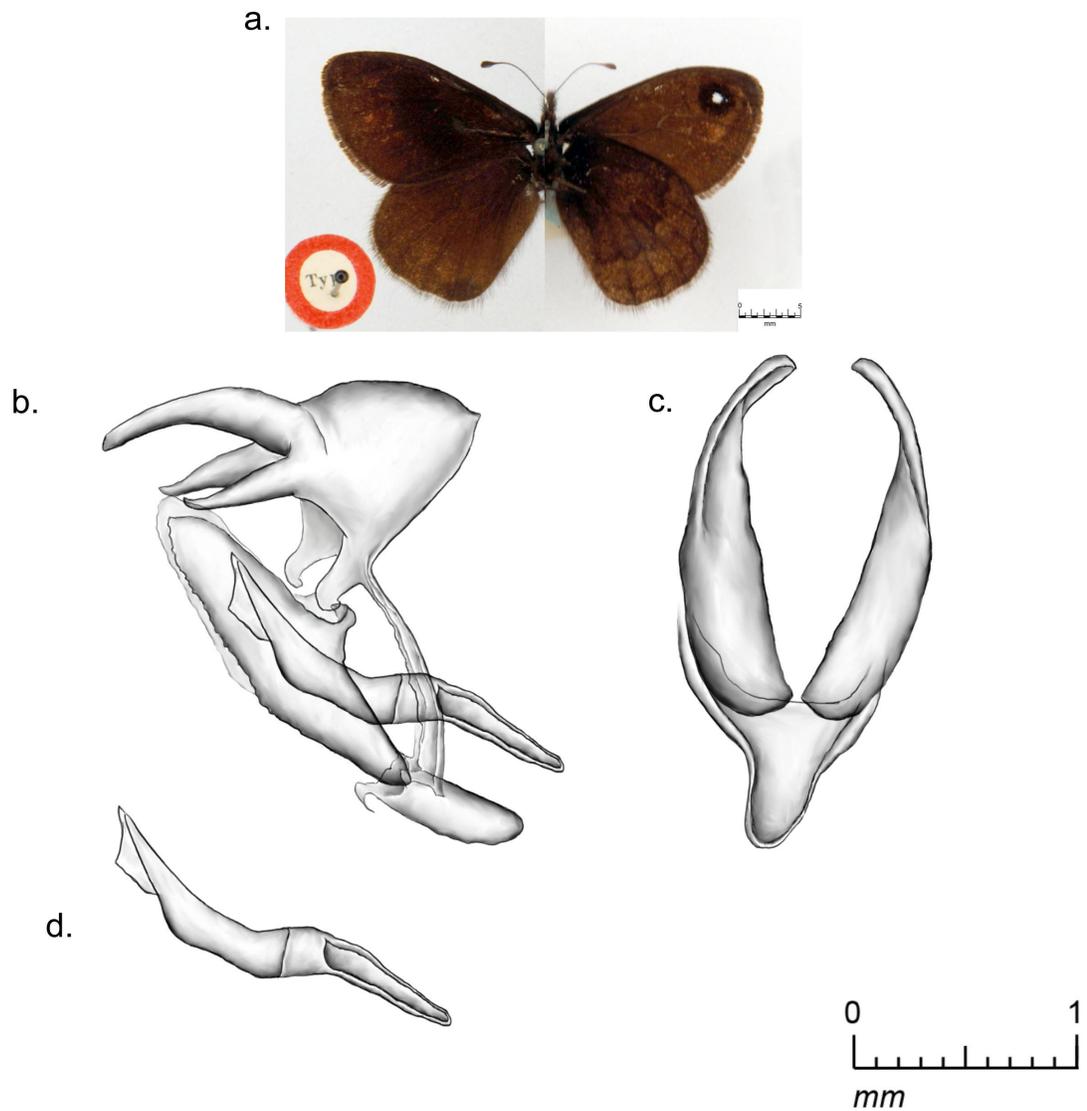


Figure 11-3. (a) Male holotype dorsal (left) and ventral (right) BMNH#809770 and (b-d) male genitalia

CH30-1

## Bibliography

- Berg FWK. 1877a. Beiträge zu den Lepidopteren Patagoniens. Bulletin de la Societe imperiale des naturalistes de Moscou 52(2):1-22.
- Berg FWK. 1877b. Contribución al estudio de la fauna entomológica de Patagonia. Anales de la Sociedad científica argentina 4(2):87-102.
- Berg FWK. 1882. Farrago lepidopterologica. Contribuciones al estudio de la fauna argentina y países limítrofes. Anales de la Sociedad científica argentina 13(4):164-183.
- Blanchard CE. 1852. Orden VI: Lepidopteros. In: Gay C, editor. Historia física y política de Chile según documentos adquiridos durante doce años de residencia en ella y publicada bajo los auspicios del supremo Gobierno. Zoología. Paris: C. Gay. p 1-112, plates 1-7 (1854).
- Brower AVZ. 1994. Rapid morphological radiation and convergence among races of the butterfly *Heliconius erato* inferred from patterns of mitochondrial DNA evolution. Proceedings of the National Academy of Sciences, USA 91: 6491-6495.
- Brower AVZ. 2011. Pronophilina Reuter 1896. Version 08 May 2011 (under construction). <http://tolweb.org/Pronophilina/70804/2011.05.08> in The Tree of Life Web Project, <http://tolweb.org/> (accessed 15 October, 2012).
- Brower AVZ, Freitas AVL, Lee M-M, Silva-Brandao KL, Whinnett A, Willmott KR. 2006. Phylogenetic relationships among the Ithomiini (Lepidoptera: Nymphalidae) inferred from one mitochondrial and two nuclear gene regions. Systematic Entomology 31: 288-301.
- Brower AVZ, Jeanson MM. 2004. Geographical populations and "subspecies" of New World monarch butterflies (Nymphalidae) share a recent origin and are not phylogenetically distinct. Annals of the Entomological Society of America 97: 519-523.
- Bryk F. 1944. Über die Schmetterlingsausbeute der Schwedischen wissenschaftlichen Expedition nach Patagonien 1932-1934. Arkiv för Zoologi 36A(3):1-30.
- Butler AG. 1868. Catalogue of diurnal Lepidoptera of the family Satyridae in the Collection of the British Museum. London: Taylor and Francis. 211 p.
- Butler AG. 1870. Descriptions of exotic Lepidoptera from the collection of Herbert Druce, Esq. Cistula entomologica 1(2):17-32.
- Butler AG. 1874. Description of a new genus and species of satyridian butterflies. Entomologist's monthly Magazine 10(117):204-205.
- Butler AG. 1881. List of butterflies collected in Chili by Thomas Edmonds, Esq. Transactions of the entomological Society of London 1881 4:449-486 pl. 21.
- Comstock JH. 1918. The Wings of Insects. New York: Comstock.
- D'Abrera B. 1988. Butterflies of the Neotropical Region Part V. Nymphalidae (Conc.) & Satyridae, Hill House, Victoria, Australia. p
- Dolibaina DR, Carneiro E, Dias FMS, Mielke OHH, Casagrande MM. 2010. Unpublished records of threatened butterflies (Papilionoidea and Hesperioidea) to Parana

- State, Brazil: new contributions for the evaluation of threat criteria. *Biota Neotropica* 10(3): 75-81.
- Doubleday E. 1849. The genera of diurnal Lepidoptera: comprising their generic characters, a notice of their habits and transformations, and a catalogue of the species of each genus. London: Longman, Brown, Green, & Longmans
- Elwes HJ. 1903. The butterflies of Chile. *Transactions of the entomological Society of London* 1903(3): 263-301, plates 12-15.
- Feisthamel JFPd. 1839. *Lepidopteres nouveaux recueillis pendant le voyage autour du monde de La Favorite, sous le commandement de M. Laplace, capitaine de fregate, illustres et decrits*. *Magasin de Zoologie d'Anatomie comparee et de Palaeontologie* 2(1).
- Felder C, Felder R. 1867. *Lepidoptera*. Wein: Carl Gerold's Sohn.
- Foetterle JG. 1902. Descrição de lepidopteros novos do Brazil. *Revista do Museu paulista (São Paulo)* 5:618-652 pls. 15-18.
- Forbes WTM. 1923. The Lepidoptera of New York and Neighboring States. *Memoirs of the Cornell University Agricultural Experiment station* 68: 1-729.
- Fuchs RWv. 1954. Tagfalter (Lep. Rhopal.). *Beiträge zur Fauna Perus* 4:83-84.
- Gaede M. 1931. Familia Satyridae. *Lepidopterorum Catalogus* 43: 1-320.
- Giacomelli E. 1928. Nuevos lepidópteros de Cosquín. *Boletín del Instituto de Clínica quirúrgica. Facultad de Medicina (Buenos Aires)* 4(28/31):677-690.
- Godart JB. 1824. *Encyclopédie Méthodique. Histoire naturelle. Entomologie ou histoire naturelle des crustacés, des arachnides et des insectes*. Latreille PAJBG, editor. Paris: veuve Agasse.
- Godman FD. 1905. Descriptions of some new species of Satyridae from South America. *Transactions of the entomological Society of London* 1905 1:185-190, pl. 10.
- Grant PR, Grant BR. 1994. Phenotypic and genetic effects of hybridization in Darwin's finches. *Evolution* 48(2):297-316.
- Guérin-Ménéville FE. 1830. *Lepidopteres*. In: Duperrey LJ, editor. *Crustaces, Arachnides et Insectes*. Paris: Arthus Bertrand. pp pls. 13-19.
- Guérin-Ménéville FE. [1838]. *Lepidoptères*. In: Duperrey LJ, editor. *Crustaces, Arachnides et Insectes*. Paris: Arthus Bertrand. pp 271-286.
- Hayward KJ. 1953. Satíridos Argentinos (Lep. Rhop. Satyridae) I. Los géneros (excluído Euptychia y Neomaniola). *Acta Zool. Lilloana* 13:151-159.
- Hayward KJ. 1954. Tres satíridos nuevos (Lep. Satyridae). *Revista de la Sociedad entomologica argentina* 17(1/2):15-18.
- Hayward KJ. 1962. Satíridos argentinos (Lep. Rhop. Satyridae) IV. Adiciones. *Acta Zool. Lilloana* 18:11-17.
- Hayward KJ. 1967. Tres satíridos neotropicales nuevos (Lep. Rhop. Satyridae). *Acta Zool. Lilloana* 21:19-24.
- Heimlich W. 1959. Eine neue satyride aus Chile. *Ent. Zeitschr.* 69:173-179.
- Heimlich W. 1963. Die Gattung *Argyrophorus* Blanchard (Lep., Satyridae). *Milleilungen der Münchner Entomologischen Gesellschaft* 53: 70-79, plates 3-6.
- Heimlich, W. 1972. Satyridae der südlichen Neotropis und Subantarktis (Lepidoptera: Satyridae). *Beiträge Entomologische* 22: 149-197.

- Herrera JV. 1965. *Etcheverrius* y *Palmaris*, nuevos generos de Satyridae andinos (Lepidoptera). Publicaciones del Centro de Estudios Entomologicos 7:57-73.
- Herrera JV. 1966. *Quilaphoethosus*, *Chillanella* y *Haywardella* nuevos géneros de Satyridae Andinos (Lepidoptera). Publicaciones del Centro de Estudios Entomologicos 8: 69-72.
- Herrera JV. 1974. *Auca delessei* n. sp., especie gemela de *Auca coctei* Guerin; genitalia y cariotipos de las spp. de *Auca* (Lepidoptera, Satyridae). Publicaciones entomologicas. Universidad de Chile 11:22-32.
- Herrera JV, Howarth TH. 1966. Genitalia de los tipos de Satyridae de Chile depositados en el British Museum. Publicaciones del Centro de Estudios Entomologicos 8:73-126.
- International Commission of Zoological Nomenclature. (1999) International Code of Zoological Nomenclature, International Trust for Zoological Nomenclature, London
- Jörgensen P. 1935. Lepidópteros nuevos o raros de la Argentina y Paraguay. Anales del Museo argentino de Ciencias naturales "Bernardino Rivadavia" 38:85-130, pls. 1-4.
- Junge G. 1987. Eine neue Unterart von *Cosmosatyrus chiliensis* Guerin 1832 aus Chile. Nachrichtenblatt der bayerischen Entomologen 36(2):43-47.
- Kirby WF. 1871. A Synonymic Catalogue of Diurnal Lepidoptera. London: John Van Voorst.
- Köhler PE. 1935. Prodrumus Satyridae (Lep.) argentinus. Revista de la Sociedad entomologica argentina 7:209-217 pls. 17-19.
- Köhler PE. 1939. Especies nuevas de Satyridae y complemento a mi "Prodrumus". Physis 17(49):443-447.
- Lamas, G. 2004. Checklist: Part 4A. Hesperioidea – Papilionoidea. In: J. B. Heppner (ed.). Atlas of Neotropical Lepidoptera. Gainesville, FL: Association for Tropical Lepidoptera, Inc. Scientific Publishers.
- Lamas G. 2010. Nomenclatural notes on Sayrinae (Lepidoptera: Nymphalidae). SHILAP Revista Lepidoptera 38: 197-204.
- Mabille P. 1885. Diagnoses de lepidopteres nouveaux. Bulletin de la Societe philomathique de Paris 7(9):55-70.
- Miller JS, Brower AVZ, DeSalle R. 1997. Phylogeny of the neotropical moth tribe Josiini (Notodontidae: Dioprinae): comparing and combining evidence from DNA sequences and morphology. Biological Journal of the Linnean Society 60: 297-316.
- Miller LD. 1968. The higher classification, phylogeny and zoogeography of the Satyridae (Lepidoptera). Memoirs of the American Entomological Society 24:1-174.
- Miller LD, Emmel TC. 1971. The Brazillian "*Cercyonis*" (Satyridae). Journal of the Lepidopterists' Society 25(1):12-19.
- Modolell J, Munguira ML, Garcia-Barros E. 2009. Presence and phenotypic variability of *Palmaris gustavi* (Staudinger 1898) in northern Chile, with notes on *Palmaris penai* (Hayward, 1967)(Lepidoptera, Nymphalidae, Satyrinae). Boletín Sociedad Entomológica Aragonesa. 44: 351-356.

- Peña LE. 1968. Nueva supespecie de mariposa de Chile. *Argyrophorus argenteus barrosi*, Nov. Ssp. (Lepidoptera-Satyridae). Boletín de la Sociedad de Biología de Concepción 40:91-95.
- Peña C, Wahlberg N, Weingartner E, Kodandaramaiah U, Nylen S, Freitas AVL, Brower AVZ. 2006. Higher level phylogeny of Satyrinae butterflies (Lepidoptera: Nymphalidae) based on DNA sequence data. *Molecular Phylogenetics and Evolution* 40:29-49.
- Peña C, Nylin S, Wahlberg N. 2011. The radiation of Satyrini butterflies (Nymphalidae: Satyrinae): a challenge for phylogenetic methods. *Zoological Journal of the Linnean Society* 161:64-87.
- Philippi RA. 1859. Descripción de algunas nuevas especies de mariposas chilenas, principalmente de la Provincia de Valdivia. *Anales de la Universidad de Chile* 16(12):1088-1114.
- Pyrz, TW. 2012. A new species of satyrine butterfly from Patagonia in more than a century and revisional notes on the genus *Faunula* C. Felder & R. Felder (Lepidoptera: Nymphalidae: Satyrinae). *Zootaxa* 3342: 60-68.
- Pyrz, TW, Wojtusiak, J. 2010. A new species of *Argyrophorus* Blanchard from northern Peru and considerations on the value of wing venation as a source of synapomorphies in some temperate Neotropical Satyrinae (Lepidoptera: Nymphalidae). *Genus* 21, 605-613.
- Pyrz TW, Wojtusiak J, Garlacz R. 2009. Diversity and distribution patterns of Pronophilina butterflies (Lepidoptera: Nymphalidae: Satyrinae) along an altitudinal transect in north-western Ecuador. *Neotropical Entomology* 38,(6):716-726.
- Reed EC. 1877. Una monografía de las mariposas chilenas. *Anales de la Universidad de Chile* 51(9):647-736 pls. 1-3.
- Santos JP, Iserhard CA, Tiexera MO, Romanowski HP. 2011. Fruit-feeding butterflies guide of subtropical Atlantic Forest and Araucaria Moist Forest in State of Rio Grande do Sul, Brazil. *Biota Neotropical* 11(3):253-274.
- Schaus W. 1902. Descriptions of new American butterflies. *Proceedings of the United States national Museum* 24(1262):383-460.
- Scoble MJ. 1992. *The Lepidoptera*. Oxford: Oxford UP..
- Silva C. 1916. Contribución al conocimiento del género *Epinephele* Hübner et Auct. *Revista chilena de Historia natural* 20(1/2):29-35.
- Silva C. 1917. Descripción de uno nuevo *Epinephele* y clave de las especies chilenas del género. *Revista chilena de Historia natural* 21(3):85-88.
- Staudinger O. 1898. Einige neue Tagfalterarten und Varietäten. *Deutsche entomologische Zeitschrift "Iris"* 11(1):344-360.
- Staudinger O. 1899. *Lepidopteren*. Hamburger Magalhaensische Sammelreise. Hamburg: Friederichen & Co. p 1-117 pl. 1.
- Strand E. 1942. *Miscellanea nomenclatorica zoologica et paleontologica*. X. *Folia zoologica et hydrobiologica (Riga)* 11(2):386-402.
- Swofford DL. 2000. *PAUP\** Phylogenetic Analysis Using Parsimony (\*and other methods). Sunderland, MA: Sinauer Associates.

- Thieme TAO. 1904. Neue Tagschmetterlinge aus der südamerikanischen Cordillere. Berliner entomologische Zeitschrift 49(1/2):159-161.
- Ureta E. 1956. Nuevos rhopaloceros (Lep.) de Chile. Boletín del Museo nacional de Historia natural (Santiago de Chile) 26(6):159-185.
- Viloria AL. 2003. Historical biogeography and the origins of the satyrine butterflies of the Tropical Andes (Insecta: Lepidoptera, Rhopalocera). *Una perspectiva latinoamericana de la biogeografía*. (ed. by JJ Morrone and J Llorente-Bousquets), pp. 247-261. Las Prensas de Ciencias, Facultad de Ciencias, UNAM, México, D. F.
- Vukusic P, Kelly R, Hooper I. 2009. A biological sub-micron thickness optical broadband reflector characterized by both light and microwaves. Journal of the Royal Society Interface 6 suppl 2:S193-S201.
- Wahlberg N, Braby MF, Brower AVZ, de Jong R, Lee M-M, Nylin S, Pierce NE, Sperling FAH, Vila R, Warren AD & Zakharov E. 2005. Synergistic effects of combining morphological and molecular data in resolving the phylogeny of butterflies and skippers. Proceedings of the Royal Society of London B 272: 1577-1586.
- Wahlberg N, Oliveira R, Scott JA. 2003. Phylogenetic relationships of *Phyciodes* butterfly species (Lepidoptera: Nymphalidae): complex mtDNA variation and species delimitations. Systematic Entomology 28: 1-17.
- Wallengren HDJ. 1858. Nya Fjäril-slågten. Öfversigt kungliga Vetenskaps-Akademiens Förhanlingar 15(1, 2):75-80, 81-84.
- Wallengren HDJ. 1860. Lepidopterologische Mittheilungen. Wiener entomologische Monatschrift 4(2):33-46.
- Warren, BCS. 1936. Monograph of the genus *Erebia* London: British museum (Natural History).
- Weeks AG, Jr. 1901. Descriptions of new butterflies of the genera *Pamphila*, *Epinephele* and *Gorgythion*. Proceedings of the New England zoological Club 2:79-83.
- Weeks AG, Jr. 1902. New species of butterflies from Bolivia. Entomological News 13(4):104-108.
- Weymer G. 1890. Zweite Abtheilung. Beschreibug der neuen Arten. In: Stübel A, editor. Lepidopteren gesammelt auf einer Reise durch Colombia, Ecuador, Peru, Brasilien, Argentinien und Bolivien in den Jahren 1868-1877. Berlin: A. Asher. p 182 pp., 9 plates.
- Weymer G. 1907. Exotische Lepidopteren. Deutsche entomologische Zeitschrift "Iris" 20(1):1-51 pls. 1-2.
- Weymer G. 1911. 4. Familie: Satyridae. In: Seitz A, editor. Die Gross-Schmetterlinge der Erde. Stuttgart: A. Kernen. p 193-240.
- Winter, WD Jr. 2000. Basic techniques for observing and studying moths and butterflies. Lepidopterists' Society Memoir 5: 1-444.
- Wootton RJ. 1979. Function, homology and terminology in insect wings. Systematic Entomology 4:81-93.
- Zikan JFaWZ. 1968. Inseto-fauna do Itatiaia e da mantiqueira. III. Lepidoptera. Pesquisa agropecuaria brasileira (Agronomia) 3:45-109.