

## Description of a new high Andean butterfly species (Lepidoptera: Lycaenidae: Theclinae) from the “Sierra Nevada del Cocuy”, Colombia

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### Abstract

A new species of *Penaincisalia*, *P. elisabeth* sp. n. is described and diagnosed from the “Sierra Nevada del Cocuy” in north-eastern Colombia. Adult specimens and genitalia of both sexes are illustrated and compared with *P. saraha*, hypothetically the most closely related species.

**Key words:** Andes, Pons, Boyacá, “browni group”, *Penaincisalia*

### Introduction

The “browni group” of *Penaincisalia* consists of eight species: *P. browni* (Johnson), *P. regala* (Le Crom & Johnson), *P. saraha* (Johnson), *P. vittata* (Johnson), *P. magnifica* (Johnson), *P. cuiva* Prieto & Rodriguez, *P. purpurea* (Johnson) and *P. caeruleonota* Hall & Willmott. Recently this species group was reviewed and all species illustrated showing in some cases its geographical variation (Prieto et al. 2008). However, a distinctive new taxon has been collected after that review appeared, in the “Sierra Nevada del Cocuy”, a compact mountain mass extending in a north-south direction in the eastern “cordillera” in Boyacá and one of the most striking mountain massifs of Colombia. Although this taxon is not currently known to be sympatric with *P. saraha*, presumably the most closely related species, it possesses unique wing pattern characters.

The species described below belongs to the Eumaeini because it has ten forewing veins, male genitalia lacking a juxta and the male foretarsus is fused and stubby tipped (Eliot 1973). It is placed in *Penaincisalia* because it has an androconial cluster consisting of a scent pad at the distal portion of the discal cell in the forewing, and a minute brand, presumably a scent patch (Bálint & Wojtusiak 2006; Johnson 1990). This genus was placed within the *Micandra* section of Eumaeini by Robbins (2004). This new species belongs to the “browni group” because it presents a sexual dimorphic hindwing tornus where the male has a spatulated lobe and the female has a well developed tail accompanied by a small lateral lobe (Bálint & Wojtusiak 2006; Prieto & Rodriguez 2007).

### Methods

For comparative purposes with the species described below, the external morphological variation was analyzed among 40 males and 7 females and 7 genital dissections of male and female specimens of *P. saraha* from Colombia and Ecuador from various museums and private collections, as noted below.

We used terminology for genitalia and wing pattern morphology from Eliot (1973), Robbins (1991) and Johnson (1992). Dissections of the genitalia were made using standard techniques for Lepidoptera, macerating the abdomen in a hot 10% KOH solution. The adult images were taken with a digital camera (Nikon Coolpix 4500). Images of the genitalia structures were taken with the same camera attached to a Zeiss DV4 stereomicroscope and a Leica DMRB microscope.

Acronyms for the collections from which *P. saraha* data were gathered are as follows:

CP—Private collection of Carlos Prieto, Cali, Colombia.

HNHM—Magyar Természettudományi Múzeum (Hungarian Natural History Museum).

IAVH— Alexander von Humboldt Institute, Villa de Leyva, Colombia.

ICN-MHN—Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá.

JFLC—Private collection of Jean Francois Le Crom. Bogotá, Colombia.

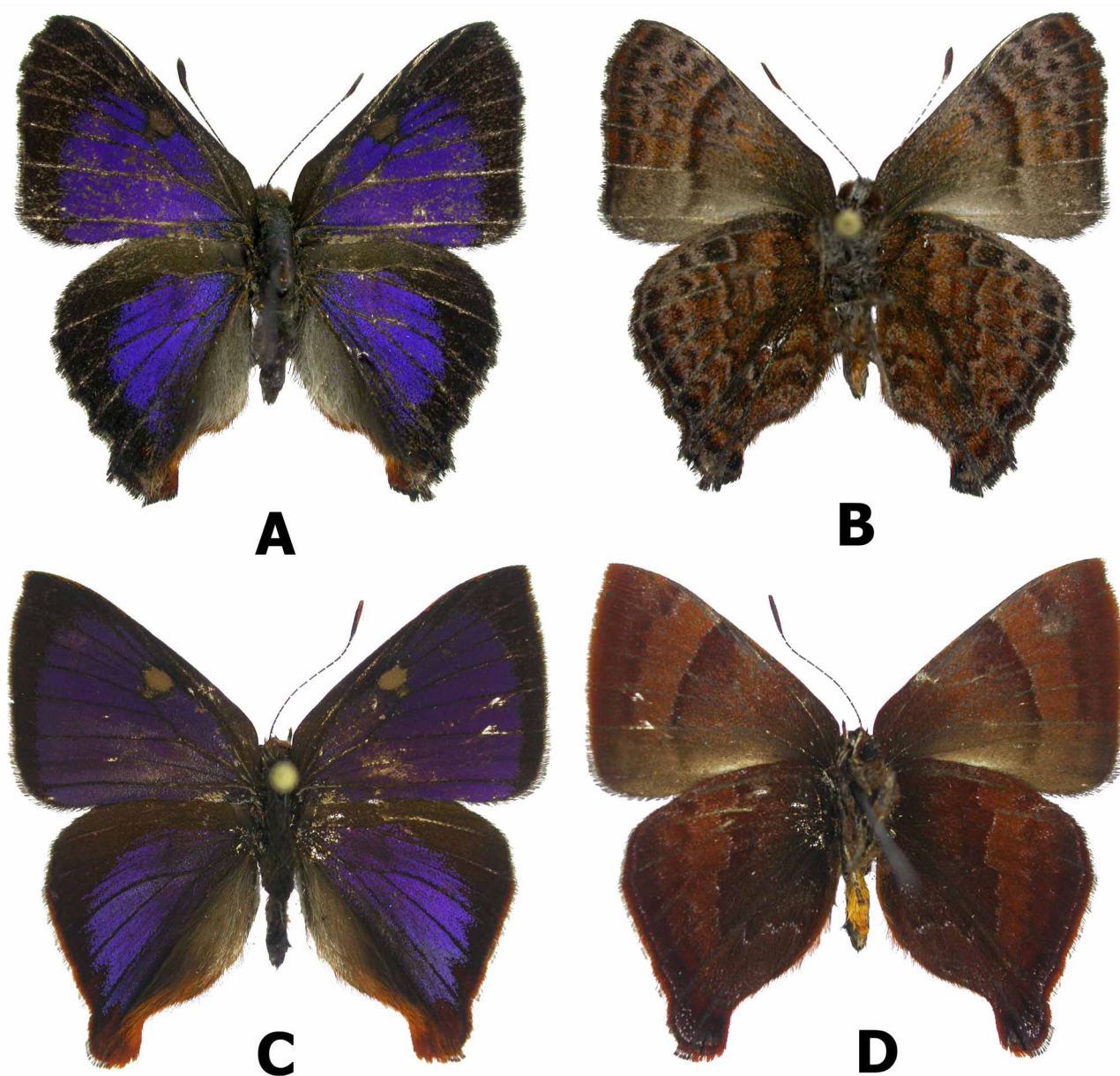
MZUJ—Zoological Museum, Jagiellonian University, Krakow, EU (Poland).

PB—Private collection of Pierre Boyer, Aix en Provence, EU (France).

***Penaincisalia elisabeth* Prieto, sp. n.**

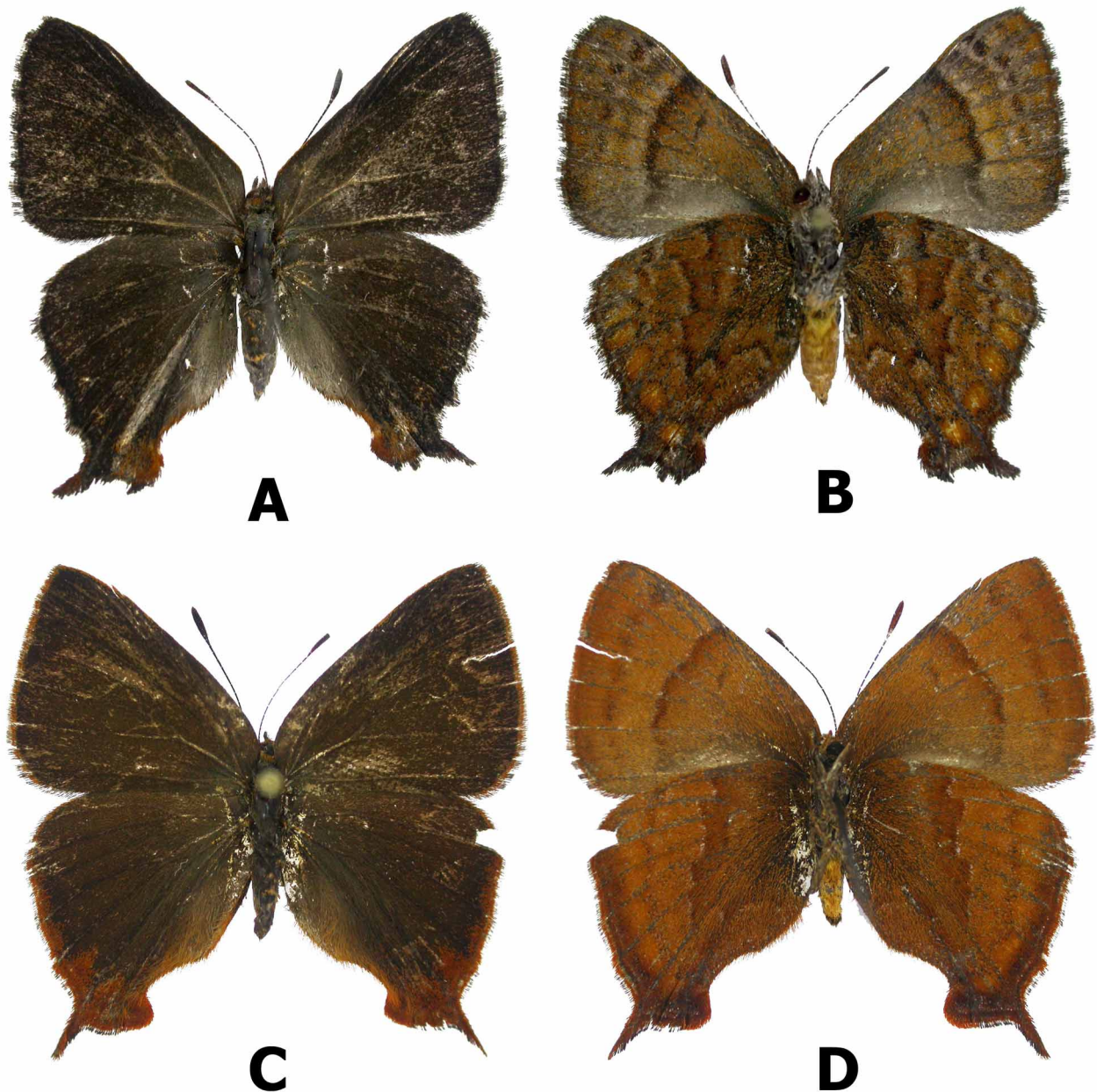
(Figs. 1 A,B; 2 A,B; 3 A,B,C)

Type material: Holotype ♂ ICN: COLOMBIA, Boyacá, Sierra Nevada del Cocuy, Güicán, La Capilla, 3380m, 14/01/2009, m 1095, C. Prieto Leg. Deposited in ICN-MHN.



**FIGURE 1.** Adults—male (dorsal surface on left and ventral surface on right). A, B Holotype ♂ *P. elisabeth*; C, D *P. saraha* ♂ Colombia, Cauca.

Paratypes: 2 ♂ CP: Colombia, Boyacá, Sierra Nevada del Cocuy, Güicán, La Capilla, 3380m, 13/01/2009, C. Prieto Leg, m 1097, m 1094; 1 ♂ CP: Colombia, Boyacá, Sierra Nevada del Cocuy, Güicán, Monserrate, 3680m, 19/01/2009, C. Prieto Leg, m 1096.; 1 ♀ CP: Colombia, Boyacá, Sierra Nevada del Cocuy, Güicán, La Capilla, 3380m, 15/01/2009, C. Prieto Leg., m 1093.



**FIGURE 2.** Adults—female (dorsal surface on left and ventral surface on right). A, B paratype ♀ *P. elisabeth*; C, D *P. saraha* ♀ Colombia, Cauca.

### Description

#### Male.

*Wing shape:* Average forewing length 13.9 mm, N=3 (measured from forewing apex to base at thorax), Hindwing tornus appearing as a blunt spatulated lobe. Hindwing and forewing margin slightly scalloped.

*Dorsal wing surface:* Both wings deep blue except for a broad black border (approximately 5mm) at submarginal and marginal area of wings. Black costal margin on both wings.

*Ventral wing surface*: Ground colour of both wings reddish brown, with several tones of brown, reddish brown scales. Variegated ventral pattern, as illustrated in the figure (1B).

*Body*: Thorax blackish, abdomen blackish dorsally and orange ventrally.

*Genitalia* (fig. 3 A,B): Eighth abdominal tergite simple and in shape rectangular; caudal extension of valvae in lateral view approximately 1/2 length of valvae and with a smoothly rounded dorsal margin at basal portion; valvae ventral keel with triangular blunt projection; uncus with very deep and rounded medial indentation dorsally; aedeagus long and uniformly narrow throughout, with a prominently convex anterior half, a shallowly concave posterior half; distal portion of aedeagus possesses two cornuti, first a flattened, concave and serrate-tipped rod positioned dorsally in posterior third of aedeagus, and second short, anteriorly tapered, convex and dorsally serrate. Saccus small and triangular in shape.



**FIGURE 3.** Genital structures. A, paratype *P. elisabeth* male genitalia in lateral view; B, paratype *P. elisabeth* male genitalia in ventral view (aedeagus removed); C, *P. elisabeth* female, ductus bursae in lateral view; D, *P. saraha* female, ductus bursae in lateral view. Relation between anterior and posterior ductus bursae length is indicated.

Female.

*Wing shape:* Forewing shape triangular and pointed, hindwing apex rounded and anal tail occurring as a lateral lobe accompanied with a long tail extending from distal portion of vein CuA2 plus a very short extension of vein CuA1.

*Dorsal wing surface:* Both wings totally brown. Hindwing tornal lobe suffused with reddish brown scaling.

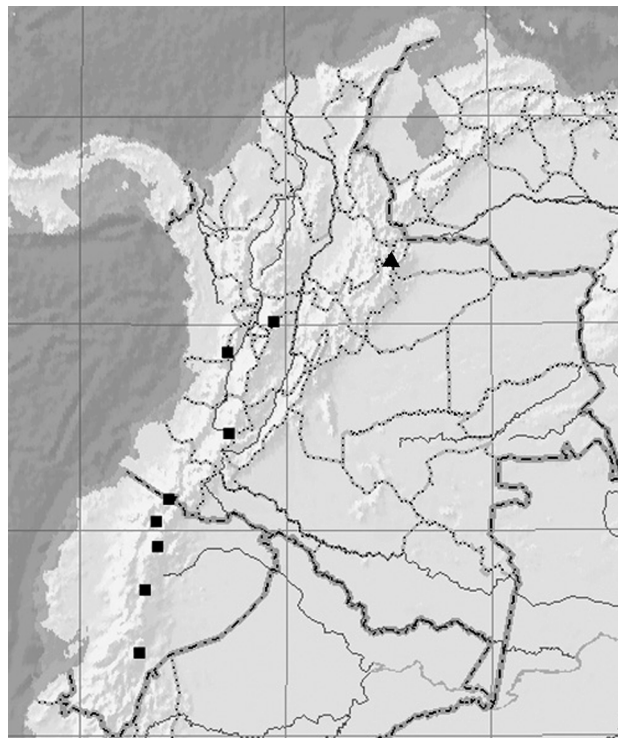
*Ventral wing surface:* Ground colour of both wings reddish brown to orange. Wing Pattern as in the figure 2 A,B. Thorax blackish, abdomen blackish dorsally and orange ventrally.

*Genitalia:* Posterior region of ductus bursae with same length as anterior region. Anterior and posterior sections of ductus bursae not divided by a conspicuous membranous area or hollow (Fig. 3C). Corpus bursae with two large and simple signa inwardly toothed in lateral view.

**Etymology:** This species is named *P. elisabeth* as a feminine noun in apposition, indeclinable and non-latinized derived from the personal name Elisabeth. This species is dedicated to Mr. Michael Bosch and his wife Elisabeth (Germany), in recognition of the kind help and support to the study and conservation of neotropical butterflies.

**Diagnosis and discussion:** Although associating the sexes of many Eumaeini species is difficult, the newly described species has distinctive ventral wing patterns and restricted known geographical ranges, factors that allow associate both sexes with a high degree of confidence.

The ventral wing pattern of *P. elisabeth* is easily distinguished from that of *P. saraha* or any other “browni group” species. The variegated ventral wing pattern on males and females, and the scattered fringe plus the deepest blue dorsal coloration consistently differentiate males of the new species. Although, *P. elisabeth* and *P. saraha* are not known to be sympatric, because wing pattern and genitalic structures in *P. saraha* do not vary a great extent with elevation (from 2800-3700m), or geographically (from southern Ecuador to central Colombia) and there is no indication of morphological intergradation, it appears unlikely that *P. elisabeth* is an ecotypic or geographical variant of *P. saraha*. Based on current evidence, *P. elisabeth* appears to be a distinct, allopatric species.



**FIGURE 4.** Map of Colombian and Ecuadorian Andes illustrating the known distribution of *P. elisabeth* (triangle) and *P. saraha* (square).

**Biology:** The species displays hilltopping behavior typical of the members of this genus. Individuals were assembled on top of trees 2–5 m high, between 12:30 and 14:30 hours flying together with *Podanotum metallicus* Torres & Johnson, 1996 and *Rhamma commodus* (Felder & Felder, 1865). The larval host plants and the nectar sources of the adults are unknown.

**Distribution:** *Spatial:* The species is known only from the type locality in Colombia (Fig. 4) at 3380–3680 meters above sea level. *Temporal:* Known only from January.

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