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Description of a new remarkable species of *Lymanopoda* WESTWOOD and identification of a centre of endemism of cloud forest butterflies in Belmira, northern Central Cordillera, Antioquia, Colombia (Lepidoptera: Nymphalidae: Satyrinae)

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ABSTRACT. A new species, *Lymanopoda paisa* n. sp., is described from the northern extremity of the Colombian Central Cordillera in Antioquia. It is closely related to *L. ionius*, as indicated by the male genitalia and underside colour pattern. However, *L. paisa* has an unusual upperside colour pattern with a large, light blue patch covering basal two-thirds of the wings. It is apparently endemic to the northern part of the Central Cordillera in Antioquia, in the Belmira area, which is identified here as a local centre of endemism of cloud forest butterflies.

Key words: entomology, taxonomy, zoogeography, Belmira, Colombian Central Cordillera, *Lymanopoda*, new species, páramo, Pronophilina

INTRODUCTION

Several cloud forest butterflies of the subfamily Satyrinae were described at the turn of the Nineteenth century from the Colombian department of Antioquia, including *Eretris porphyria catargyrea* STAUDINGER, *E. apuleja subrufescens* GROSE-SMITH, *Panyapedaliodes jephtha* (THIEME), *Pedaliodes baccara* (THIEME), *Praeprophila petronius* (GROSE-SMITH), and *Ianussiusa maso* (GODMAN). For nearly a century there was an extreme shortage of material from this part of the Andes. Even Michael ADAMS (1986), who sampled extensively throughout Colombia from 1971-1983, never collected in Antioquia, and in his papers he referred only to the Thomas K. SALMON historical specimens curated in the BMNH

(London). Recently however, thanks to the increased collecting activity of the junior author, the butterflies from Antioquia started becoming available for researchers. In consequence, several species and subspecies of *Pronophilina* (Nymphalidae, Satyrinae) were described, including *Pronophila unifasciata antioquiiana* (PYRCZ 2004a), *Pedaliodes kruegeri belmira* (PYRCZ 2004b) and *Panyapedaliodes cocorna* (PYRCZ & RODRÍGUEZ 2005).

The genus *Lymanopoda* WESTWOOD comprises a total of 59 species (LAMAS *et al.*, 2004)*. From among 27 species of *Lymanopoda* occurring in Colombia only seven are found in Antioquia (apart from the described herein: *L. albocincta* HEWITSON, *L. altis* WEYMER, *L. caucana* WEYMER, *L. ionius* WESTWOOD, *L. labda* HEWITSON and *L. obsoleta* (WESTWOOD)). This is a relatively low diversity, compared to 10 species reported for the departments of Tolima, or 11 species for Cundinamarca (ADAMS 1986).

*The genus *Sabatoga* APOLINAR, has been considered valid by LAMAS *et al.* (2004), and is a subjective synonym of *Lymanopoda* as showed by PYRCZ (Ph.D.), and its type species - *L. mirabilis* (STAUDINGER) - is a sister species of *L. vivienteni* (APOLINAR) (ADAMS 1986).

MATERIAL AND METHODS

Type material and original descriptions were consulted for all mentioned taxa. Recent *Lymanopoda* material was obtained in Antioquia by the junior author from 1983 on, and by the senior author in 2003. Dissections of male genitalia were made according to a standard procedure, by maceration in a hot 10% KOH solution. Abdomens were stored in glycerol for study under stereomicroscope. Adults were photographed with a Minolta Dimage 5 digital camera. Colour plates were assembled with PhotoShop 07 software package. Morphological terms for genitalia largely follow KLOTS (1956) and for venation follow COMSTOCK & NEEDHAM (1918). The following abbreviations were used in the text:

D: Dorsal;

V: Ventral;

FW: Forewing;

HW: Hindwing;

BMNH: The Natural History Museum, London, U.K.;

GRM: collection of Gabriel RODRÍGUEZ, Medellín-Envigado, Colombia;

MZUJ: Muzeum Zoologiczne Uniwersytetu Jagiellońskiego, Kraków, Poland;

TWP: collection of Tomasz Wilhelm PYRCZ, Warsaw, Poland.

TAXONOMY

Lymanopoda paisa n. sp.

(Figs. 1, 2)

TYPE MATERIAL

Holotype ♂: Colombia, Departamento Antioquia, Los Llanos - San Andrés road km 12-13, Santa Rosa, 2600 - 2750 m, 14.IX.2003, T. Pycrz leg., MZUJ; **Paratypes** (5♂♂): 1 male: same data as the holotype, TWP; 2 males: same locality, 2600 m, X.1983(?), GRM; 1 male: same locality, 2700 m, 13.IX.2003, GRM; 1 male: same locality, 2700 m, X.2004, GRM.

DIAGNOSIS

The light blue basal half of fore and HWD allows an immediate discrimination from any congener.

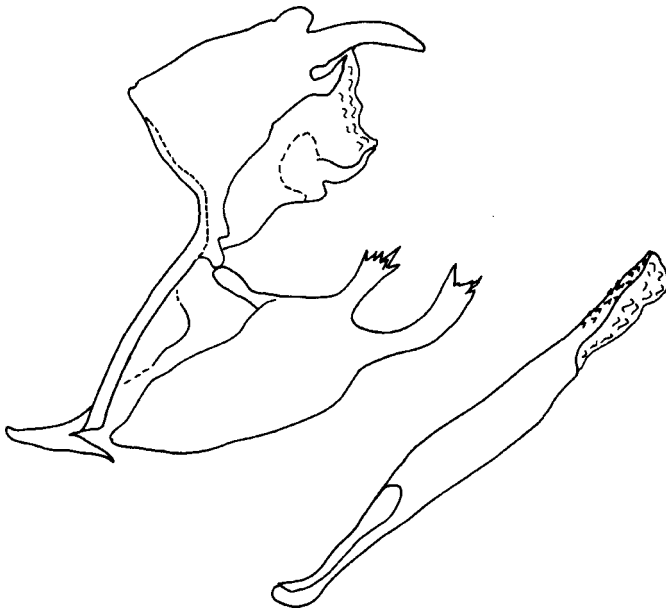
DESCRIPTION

Male (Fig. 1): *Head*: Frons with a tuft of brown, yellow and grey hair; labial palpi twice the length of head, covered dorsally with mixed dark brown and yellow hair, ventrally with black hair along the edges and light grey through the middle; antennae reaching $2/5$ of the length of costa, medium brown, shaft with light blue scales at base of each segment, club thickening gradually, composed of 8 segments, darker, slightly flattened with a ventral bruise; eyes medium brown, lustrous, covered with sparse, but rather long black setae. *Thorax*: Dorsally black, covered with sparse yellow and brown hair; ventrally covered with dense light



1. *Lymanopoda paisa* male (holotype): left - dorsal, right - ventral

grey hair; legs tibia and femur black dorsally covered with beige and yellow scales, ventrally with dense light grey hair; tarsus and metatarsus brown covered with beige and yellow scales. Abdomen: Dorsally and laterally black covered with black scales and sparse hair, ventrally covered with dense pale yellow hair and scales. Wings: FW (length: 16.5-17.5 mm; mean: 17 mm; n=6) apex acute, outer margin truncate below apex; HW oval, outer margin regular, tornus angular. FW and HW fringes short, blackish brown. FWD basal one third to half light blue, lustrous; distally blackish brown; three minute subapical white dots in cells R5-M1, M1-M2 and M2-M3; two postdiscal, faint black ocelli with white pupils in cells M3-Cu1 and Cu1-Cu2. HWD basal one third to half light blue, lustrous; distally blackish brown. FWV basal half, along costa, apex and along outer margin ochreous; two wavy reddish-brown lines across discal cell, one through the middle, the other closer to distal edge; a wavy reddish-brown postdiscal line, composed of three streaks bent basally, from near costa to vein M3, and across base of cells M3-Cu1 and Cu1-Cu2; postdiscal and submarginal area black, suffused with ochreous scales along the edges, with some red scales apparent along outer edge in cells Cu1-Cu2 and on tornus; a series of three white subapical dots as on the upperside placed along the border between black postdiscal and ochreous apical areas; two faint black postdiscal ocelli with white pupils in cells M3-Cu1 and Cu1-Cu2, plus an additional one, very small and barely noticeable, on the tornus in cell Cu2-1A. HWV ground colour ochreous with a slightly darker



2. *Lymanopoda paisa* male genitalia (paratype): lateral view, aedeagus extracted

pattern of faint submedian, postdiscal and submarginal bands; a series of seven black postdiscal dots, from costa to tornus each in one cell, except for two in Cu2-1A.

Male genitalia (Fig. 2): Superuncus short; uncus slightly curved downwards, medium long; subuncus short and adhered to the base of uncus; subscaphium sclerotized; valvae with two prominent processi, dorsal and apical, both dentate and similar in length; aedeagus slightly longer than valva, straight, apical one-third covered with cornuti.

Female (not illustrated): Similar to the male except that brown scales of the upperside are duller and slightly lighter, and the light blue area is slightly more restricted basally (note: due to insecure depository, the female is not included in the type series).

ETYMOLOGY

The specific epithet - *paisa* - designates an inhabitant of the region of Colombia, which includes the departments of Antioquia and Caldas, thus refers to the area where this species occurs.

AFFINITIES

The new species belongs to the genus *Lymanopoda* because it presents all the generic synapomorphies of wing colour pattern - FW submarginal ocelli in M3-Cu1 and Cu1-Cu2 displaced distally relative to M2-M3, a pierellization of the ventral HWV ground plan; and male genitalia - a bulbous superuncus, a gnathos fused along the ventral surface of tegumen, a sclerotized sub-scaphium (PYRCZ 2003, 2004c). *L. paisa* belongs to the “*ionius* clade” (PYRCZ Ph.D.), which includes *L. ionius* WESTWOOD, *L. labineta* HEWITSON, *L. nivea* STAUDINGER, *L. schmidti* ADAMS, *L. lactea* HEWITSON and *L. pieridina* RÖBER, recognised by the colour pattern, ground plan elements and male genitalia sclerites. It is most closely allied to *Lymanopoda ionius* ssp. occurring in central and southern Antioquia. The two share similar size, wing shape, and underside colour and pattern, as well as male genitalia, especially the prominent dorsal process on the valvae. This taxon alongside other new subspecies from Colombia and Ecuador will be described in a forthcoming revisional paper of the “*ionius* clade” (PYRCZ in prep.). *L. paisa* and *L. ionius* ssp. are considered specifically distinct on the basis of the striking, blue upperside of *L. paisa*, which is assumed to play an important role in the mating and species recognition systems, and as such must be an effective specific isolation factor.

ZOOGEOGRAPHY

The Central Cordillera in Antioquia is considerably lower than in the central (Tolima, Quindío) or southern (Huila, Cauca) part of the range, where the snow-capped peaks of the Nevado de Tolima, the Nevado de Huila and others reach well above 5000 m. In comparison, the highest elevation of the Central Cordillera in Antioquia is the Alto de Belmira at a modest 3285 m. Lower mean altitudes are

reflected in the lower ecological diversity of the Antioquian highlands. The entire high elevation orcal biome of the northern Andes, known as páramo, is almost non-existing. This, in turn influences the lower diversity of montane butterfly taxa.

The Páramo de Belmira is the highest area of the Central Cordillera in the department of Antioquia, situated in the Belmira district at ca. 6°69'N 75°67'W. It is a compact massif extending in the North-South direction with seven peaks slightly exceeding 3000 m, including the top elevation at the Alto de Belmira (3270/3285 m) (the latter measured with NASA WorldWind Software), Alto El Morrón (3265 m) and Alto El Peñol (3245 m). It is the only pocket of high elevational open páramo vegetation, characterised by the dominance of *Calamagrostis* sp. (Poaceae) bunch grasses and *Espeletia* sp. (Asteraceae) rosette plants, in the Antioquian Central Cordillera.

The first indication that this area is possibly a local centre of endemism of cloud forest butterflies was the discovery of *Catantixia tricolor rodriguezii* EITSCHBERGER & RACHELI (1998). This subspecies of a widely distributed north Andean high elevation species is still known exclusively from the type locality. The first taxon of Satyrinae described from Belmira was *Pedaliodes kruegeri belmira* PYRCZ et RODRÍGUEZ (PYRCZ 2004b). It is a forest-páramo ecotone specialist, and its nominate subspecies occurs in southern Colombia (Puracé) and northern Ecuador (PYRCZ *op. cit.*). The type locality of *Lymanopoda paisa* is situated a few kilometres east of Belmira. The habitat is a mixture of secondary grassland and patchy cloud forest. Even though a lot of research work is still needed in order to acquire a more comprehensive knowledge of the cloud forest Satyrinae fauna of Colombia, we assume that *L. paisa* is effectively endemic of that area, because in other localities situated southwards in Antioquia it is replaced by a closely related, phylogenetically and ecologically, *L. ionius* ssp. (PYRCZ in prep.). The Belmira highlands have not been sampled extensively so far, therefore we may not exclude the presence of other endemics, particularly the páramo specialists belonging to the diverse *Lymanopoda huilana* WEYMER group.

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