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Filling gaps in the distribution patterns of the genus *Lasiophila*
C. & R. FELDER: a new species from the valley of Kosñipata
(Cuzco, Peru)
(Lepidoptera: Nymphalidae: Satyrinae)

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ABSTRACT. The Andean genus *Lasiophila* divides into three, apparently monophyletic groups (“zapatoza”, “prosymna” and “circe”), identified by morphological and ecological traits. Their representatives occur parapatrically along altitudinal gradients. The mid-elevation “prosymna” group is the most diverse and taxonomically most complex. Until this study no representative of this group was known from the vast south-east Peruvian department of Cuzco. The discovery of *Lasiophila luna* n. sp., described here, in the upper Kosñipata valley fills an important gap in the distribution pattern of the genus *Lasiophila*.

Key words: entomology, taxonomy, new species, Lepidoptera, Nymphalidae, Satyrinae, *Lasiophila*, Andes, cloud forest, parapatric distributions.

INTRODUCTION

The genus *Lasiophila* C. & R. FELDER belongs to the tribe Pronophilini (Nymphalidae, Satyrinae) (*sensu* MILLER 1968), considered by some authors as a subtribe Pronophilina (LAMAS *et al.* 2004). The adults of *Lasiophila* are medium sized butterflies, with a wingspan between 5 - 9 cm, characterised by oval hindwings with a strongly scalloped outer margin, protruded apex and tail-like extension at vein Cu1 (spatulate in some species), predominantly rufous or brick-red upperside with black patches towards outer margin, and conspicuous orange or white forewing submarginal markings, exceptionally with a white hindwing

median patch (PYRCZ 1999, 2004). The venation of *Lasiophila* is typical of the Pronophilini with the hindwing disco-cellular vein m1-m2 curved inside the cell and the forewing veins Rs and M1 arising slightly apart (MILLER 1968; ADAMS 1986). Antennae are short, about 2/5 the length of the costa, chestnut or orange with a black, slender club. Palpi are moderately long to very long (4 - 6 mm). Eyes are covered with sparse, long setae. Male genitalia are rather simple with a long and narrow uncus, rather short gnathos approximately one-third the length of uncus, valvae with a dentate dorsum without any prominent secondary process, and a very deep saccus.

The genus is strictly South American and almost entirely Andean, ranging from northern Argentina (Tucumán) to northern Colombia (Sierra Nevada de Santa Marta) and Venezuela (Cordillera de la Costa). However, there is a sight report from the Guyana Shield in south-eastern Venezuela (PYRCZ & FRATELLO 2005). In the first generic monograph THIEME (1907) recognised 18 species. This number has shrank to 14 species in the recent catalogue by LAMAS *et al.* (2004), because some taxa were synonymized, some other reduced to the status of subspecies, and no other species, as compared to Thieme (*op. cit.*) was described. Larval host plants are montane *Chusquea* bamboo (Poaceae), similarly to most species of neotropical montane Satyrinae (PYRCZ 2004). The early stages of *Lasiophila* are unknown and their biology remains unexplored.

MATERIAL AND METHODS

All the individuals of the new species were collected with entomological hand nets. They were examined in MZUJ, and compared against the types of *Lasiophila* deposited in BMNH, MZUJ and TWP. Male genital dissections were made according to standard procedure, by soaking in a hot 10% KOH solution, and preserved in glycerol vials. Adults were photographed with Olympus E-500 digital camera. Genitalia and other microstructures were examined under Olympus SZX9 stereomicroscope. The following abbreviations and collection codens were used:

- HW: hindwing;
- FW: forewing;
- V: ventral surface;
- D: dorsal surface;
- BMNH: Natural History Museum, London, UK (formerly British Museum (Natural History));
- MUSM: Museo de Historia Natural de la Universidad Nacional Mayor de San Marcos, Lima, Peru;
- MZUJ: Muzeum Zoologiczne Uniwersytetu Jagiellońskiego, Kraków, Poland;
- PBF: Collection of Pierre BOYER, Le Puy Sainte Réparate, France;
- TWP: Collection of Tomasz W. PYRCZ, Warsaw, Poland (to be incorporated into MZUJ);

***Lasiophila luna* n. sp.**

(Figs. 1-3)

TYPE MATERIAL

HOLOTYPE ♂: Peru, Cuzco, vía Acjanaco – Pillcopata, Valle del Kosñipata, Qda. Toccahuayco, 2700-2750 m, 26.V.2003, T. Pycrz *leg.*, currently in MZUJ, to be deposited in MUSM; ALLOTYPE ♀: same locality and altitude as the holotype, 22.V.2003, T. Pycrz *leg.*, MZUJ; PARATYPES (6mm): 2mm: same data as the holotype, TWP; 1m: same data as the holotype but 24.V.2003, MZUJ; 3mm: same data as the holotype but 22.V.2004, P. Boyer *leg.*, PBF.

DIAGNOSIS

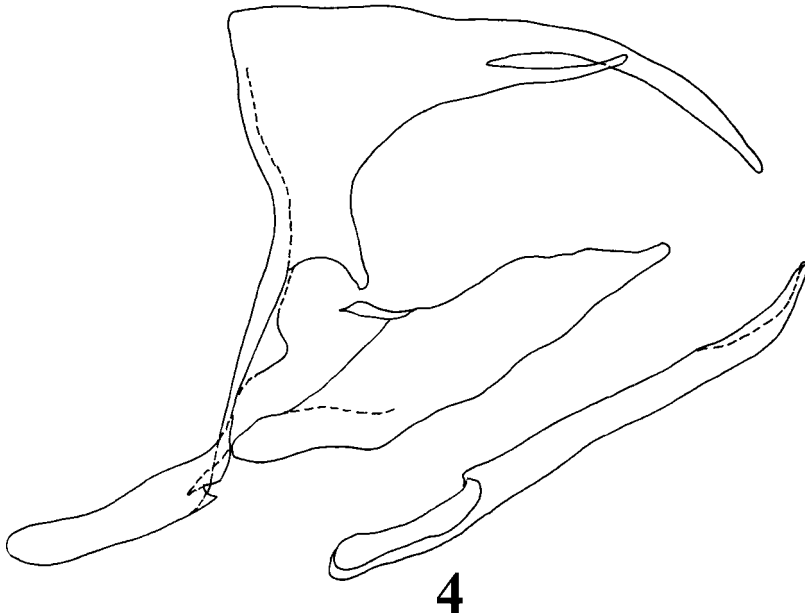
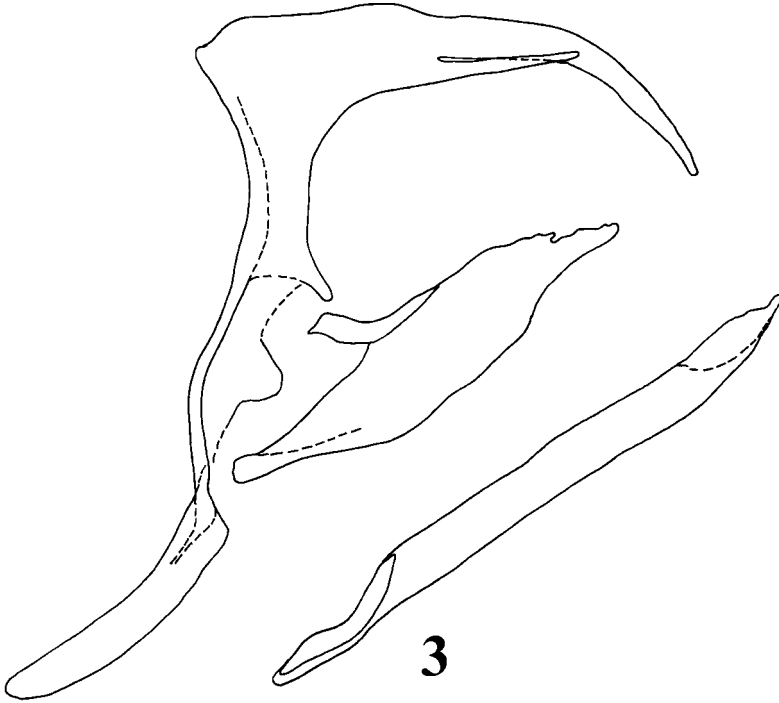
Compared to the parapatric species, *L. luna* is slightly larger than *L. orbifera* BUTLER, and also differs by the brick-red, instead of crimson-red upperside, without the heavy black forewing median suffusion typical of *L. orbifera*; and is recognised immediately from *L. piscina* THIEME, which has a white HW median patch. *L. luna* at first sight is reminiscent of *L. hewitsonia* BUTLER and *L. circe* C. & R. FELDER. The most straightforward distinctive feature is the presence of a row of black rounded submarginal spots enclosed within red oval patches on the FWD in these two species, whereas in *L. luna* oval submarginal patches are free of any black spots.

DESCRIPTION

MALE (Fig. 1): Head: frons with a tuft of dark brown hair; eyes chocolate brown, setose; antennae slender, reaching half of the length of costa, dorsally chestnut, ventrally orangey, club blackish brown; labial palpi 4.5-5 mm long, covered ventrally with sandy yellow, laterally with grey-brown hair, on the terminal segments chocolate brown. Thorax: dorsally blackish brown, ventrally black, covered with dense light grey hair; legs sandy yellow. Abdomen: dorsally and laterally blackish brown, ventrally light grey. Wings: Forewing (length 31-32 mm, mean: 31.2 mm, n=4) apex sub-acute, outer margin very slightly concave; Hindwing outer margin scalloped, forming an approximately 5 mm long tail-like extension along vein Cu1; fringes short, intermittently brick-red and sandy yellow. FWD ground colour brick-red, lustrous; distal two-fifths black extending from distal margin to distal end of discal-cell and from root of vein M3 to anal margin parallel to outer margin, the border between brick-red and black area diffuse; an elongate sub-apical brick-red patch and a series of four submarginal brick-red patches in cells M2-M3 to Cu2-1A, the largest one in Cu1-Cu2. HWD ground colour brick-red, lustrous; a black irregular postdiscal band with a diffuse basal edge; a series of six large black, rounded submarginal patches, in M3-Cu1 and Cu1-Cu2 with deep distal incisions; a wide black marginal band; postdiscal and marginal bands crossed by a black stripe on vein M3. FWV ground colour brick-red, lighter than on the upperside; a wide irregular, black postdiscal patch; a



1, 2. Adults (dorsum/venter): 1 - *Lasiophila luna* male (holotype), 2 - *Lasiophila luna* female (allotype)



3, 4. Male genitalia (aedeagus extracted): 3 - *Lasiophila luna* (paratype), 4 - *Lasiophila regia* (Carcel Punco, Puno)

large post-discal patch extending from costa to cell M2-M3, brick-red but a shade lighter than the ground colour with an orange costal suffusion; a series of three submarginal oval patches in M3-Cu1 to Cu2-1A, brick-red, a shade lighter than the ground colour; subapical area dusted with light brown and magenta; marginal and submarginal area pale brown, suffused with some brick-red scales from apex to vein Cu1. HWV ground colour grey-magenta; a wide median medium brown band, connected to marginal and submarginal medium brown areas by a brown stripe covering entirely the cell M2-M3; a diffuse darker brown submarginal suffusion from apex to cell M1-M2; a series of irregularly shaped sandy yellow submarginal dots in cells M2-M3 to Cu1-1A, ringed with a diffuse darker brown area. MALE GENITALIA (Fig. 3): Similar to *L. regia* STAUDINGER (Fig. 4), except for the slightly thinner tegumen, deeper saccus and somewhat irregular valvae along dorsal surface.

FEMALE (Fig. 2): Similarly patterned to the male, but the upperside ground colour is considerably lighter, pale brick-red; postmedian, subapical and submarginal patches are orangey; forewing length: 33 mm.

ETYMOLOGY

This species is dedicated to Miss Valeria LUNA, Argentinian entomologist from Buenos Aires, specialising in the butterfly gardening.

DISTRIBUTION AND AFFINITIES

PYRCZ (1999) identified three groups of species within the genus *Lasiophila* recognised by morphological and ecological traits. Local faunas include generally one representative of each group replacing each other parapatrically within adjacent bands of altitude along an elevational gradient (PYRCZ 2004). Morphological characters of the low-elevation “zapatoza” and the high-elevation “circe” groups are very consistent. A number of synapomorphies can be recognised and their monophyly, although formally not demonstrated, leaves no doubt. The third, “prosymna” mid-elevation group is weakly defined, as it presents several divergent characters, especially in the wing colour pattern. It comprises *L. prosymna* (HEWITSON), *L. phalaesia* (HEWITSON), *L. parthyene* (HEWITSON), *L. alkaios* TESSMANN, *L. regia* and *L. luna* described herein. *L. phalaesia* ranges on the western slopes of the Andes in Ecuador and northern Peru, and locally on the eastern slopes in the area of Chachapoyas (PYRCZ 2004), with three subspecies restricted to the Ecuadorian Chocó and the nominate found in Ecuador and northern Peru. *L. prosymna* occurs in all three Colombian Cordilleras, in extreme north-western Ecuador (PYRCZ *et al.*, in press), and along the east slopes of the Andes, south to Morona-Santiago. It is replaced allopatrically southwards by two closely related species, *L. parthyene* found in south-eastern Ecuador and in extreme northern Peru on the left bank of the Río Marañón, and *L. alkaios* with two subspecies further south in the departments of Amazonas, San Martín, Huánuco, Junín and Pasco, possibly extending as far south as Ayacucho (PYRCZ 2004).

L. regia occurs on the southern extremity of the distributional area of “prosymna” group. It is found in the Bolivian Yungas and southern Peruvian department of Puno (Sina and Sandia valleys). Until this study, there was a big gap in the distribution pattern of the mid-elevation group. No species was known from the vast area of the Andes extending from central to extreme southern Peru. Considered that *Lasiophila* are conspicuous, large butterflies, there were reasons to believe that there are effectively no mid-elevation *Lasiophila* species in the entire Cuzco department. The discovery of *L. luna* proved this assumption incorrect, showing once again that the fauna of Andean Satyrinae is still far from being well-known.

L. luna is known so far exclusively from the valley of Kosñipata. The parallel, to the south, Marcapata valley, sampled by this author, is heavily deforested at the elevations susceptible to be inhabited by this species. Further south, the San Gaban valley needs to be more intensively sampled. To the north-west, the Lucumayo valley has been relatively well sampled only above 3000 m asl. Considered that the overall fauna of this area is highly different from that of Kosñipata (PYRCZ in prep.), and shows important affinities with central Peru, we may speculate that it is most likely inhabited by *L. alkaios*. In the valley of Kosñipata *L. luna* is replaced parapatrically at higher elevations, above 3000 m asl, by *L. piscina* ssp. (PYRCZ in prep.), whereas at lower elevations, below 2400 m asl, by *L. orbifera*. *L. luna* is not uncommon but apparently a stenobiont. It was reported only within a narrow altitude band despite repeated sampling at upper and lower elevations in the Kosñipata valley.

L. luna and *L. regia* (Fig. 2) are presumably sister-species. They share a number of common characters of male genitalia, wing shape and HWV pattern. They are of similar size, and occur within the same band of altitude, at 2500 – 2800 m asl. However, their upperside patterns are highly divergent. The colour pattern of *L. regia* is remarkable for its extreme resemblance to the nominate subspecies of *L. phalaesia*. The two taxa are so much alike, that despite geographic disjunction they could well be considered as conspecific or even synonyms. FORSTER (1964) illustrated male genitalia of *L. regia* and *L. phalaesia* demonstrating convincingly that they are separate species.

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