

Contribution to the knowledge of Ecuadorian *Pronophilini*. Part
III. Three new species and five new subspecies of *Lymanopoda*
(*Lepidoptera*: *Nymphalidae*: *Satyrinae*)

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Abstract. Three new species and five subspecies of *Lymanopoda* are described from Ecuador and their affinities within the genus are discussed. Misidentifications in Brown's (1943) survey of the genus *Lymanopoda* in Ecuador are corrected. *Lymanopoda hannemanni* L. Müller, 1991, is synonymised with *Lymanopoda confusa* F. M. Brown, 1943 (n. syn.), and the female of this species is described and figured for the first time.

Key words: entomology, taxonomy, *Lepidoptera*, *Nymphalidae*, *Lymanopoda*, new taxa, Colombia, Ecuador, Peru, Podocarpus National Park.

INTRODUCTION

The genus *Lymanopoda* WESTWOOD, 1851 is a member of the tribe *Pronophilini* sensu MÜLLER (1968), which was downranked to subtribe *Pronophilini* by HARVEY (1991), an entirely Neotropical section of the nymphalid subfamily *Satyrinae*. It comprises approximately sixty species almost exclusively confined to the Andes, with only two representatives in the Central American mountains (PYRCZ, in prep.).

Typologically, the adults of *Lymanopoda* can be characterised by their small to medium size (forewing length 20-25 mm) compared to other members of the tribe, triangular forewings which usually have an acute apex and often a convex

outer margin, oblong hindwings, often with scalloped outer margins and a short tail-like emargination at vein Cu_1 , rather short antennae, approximately 2/5 length of the costa, and eyes which are covered with short, sparse setae. The venation pattern is typical of the tribe *Pronophilini*, with the base of the cubitus of the forewing moderately swollen and the anal weakly so, and the disco-cellular vein of the hindwing between veins M_1 and M_2 , sharply angled basally near M_1 (Brown 1943; Müller 1968).

Despite the coloration of the wings varying greatly between species, ranging from white, dull brown to russet, metallic silver, green and blue, at least two synapomorphies of the genus *Lymanopoda* can be identified in the wing pattern: the ocelli in forewing cells Cu_1 and Cu_2 are always displaced basally in relation to the remainder (we refer throughout the text to wing cell spaces by the vein which lies beneath, or posterior to, that cell) and the hindwing ventral surface median band is broken and displaced in the discal cell, connected to the postbasal band („pterellization”-type distortion of the ground plan (sensu Schwanwitsch 1925)). Other generic synapomorphies are evident in the male genitalia, including: the presence of a supracunus (sensu Razowski 1996), a bulbous projection of the tegumen at the dorsal junction with the uncus; the complete absence of subunci (although a weakly sclerotised projection occurs in all species which is probably not homologous with the subunci, appearing to be a modification of the basal part of the uncus); a (usually) strongly sclerotised sub-scapium; and two prominent sculptured processes on the valvae (in a few cases the dorsal process is atrophied). In the female genitalia, synapomorphies include: a sclerotised lamella on the distal part of the posterior apophysis of the papillae anales and an accessory gland (of unknown function, most probably producing an egg gluing secretion) posterior to the ostium bursae.

As far as is known, the larvae of *Lymanopoda* feed on *Chusquea* bamboo in cloud forest (Schurtze 1929; Adams 1985), or *Swallenchloa* bamboo (*Poaceae*) in the páramo (Pyrcz unpubl.), and only exceptionally on other graminies (*L. caeruleata* Godman & Salvin, 1880, a species endemic to the Sierra Nevada de Santa Marta, Colombia, was observed by the senior author while laying eggs on *Bambusa*). The larvae of only one species, *L. samius* Westwood, have been described (Schurtze 1929), and therefore no comparative taxonomic characters are available as yet from the immature stages.

The species of *Lymanopoda* show intricate patterns of horizontal and vertical distribution. Whereas one species, *L. obsoleta* (Westwood, [1851]), is nearly Panandean, most have a much more restricted distribution, several being single range endemics, including *L. confusa* F. M. Brown 1943, discussed in this paper. They are found in premontane forests from around 800 m (*L. panacea* (Hewitson 1869)), in cloud forests and up to boggy páramo over 4000 m (*L. huiliana* Wewer 1890), within well defined, sometimes very narrow bands of elevation (Adams 1985; Pyrcz & Wortusiak in press). While *L. obsoleta* occurs from approximately 1800 to 2900 m (Adams 1986; Pyrcz & Wortusiak in press), *L. marrianna* Staudinger, 1897 is known from Venezuela from a narrow band between 3000 m

and 3200 m (Adams & Bernard 1981). The patterns of altitudinal distribution appear to be related to ecological specialisation and interspecific interactions (Pyrcz & Wortusiak in press). The species with particularly narrow vertical ranges are in most cases exclusive inhabitants of the cloud forest - páramo ecotone, such as *L. marrianna* and three of the species described herein. The adults of cloud forest *Lymanopoda* are strongly attracted to decomposing organic material, including carrion (Willmott & Hall unpubl.), dung, urine, fruits, and mineral matter found in mud (Adams 1985, 1986), but páramo species have not yet been reported to be attracted to baits. Páramo species are energetic butterflies, flying low above the ground, zigzagging among *Espeletia* composites and active only during longer periods of sunshine, whereas the cloud forest species are less motile, usually not moving far away from stands of their *Chusquea* hosts; individuals can be observed for several consecutive days in the same spot.

Brown (1943) surveyed the genus *Lymanopoda* in Ecuador, describing two new species and listing a total of 11 species for the country. That paper contains a number of identification errors resulting from the fact that Brown had no access to English and German type material, and is now largely outdated due to more extensive sampling for montane butterflies during the past decade in some of the more remote areas of the country by several lepidopterists. Nevertheless, it provides a point of reference from which to begin faunistic, revisional and taxonomic research. The first author is currently working on a revision of the entire genus *Lymanopoda*, while Keith Willmott and Jason Hall have been working since 1993 on the taxonomy, ecology and biogeography of the entire true butterfly fauna (*Papilionoidea*) of Ecuador. Therefore in this paper we describe the new taxa within the genus *Lymanopoda* that have come to light during our studies of Ecuadorian pronophilines. The following acronyms are used throughout the text:

- AMNH: American Museum of Natural History, New York, U.S.A.;
 BMNH: The Natural History Museum, London, United Kingdom;
 MALUZ: Museo de Artrópodos de la Universidad del Zulia, Maracaibo, Venezuela;
 MNCN: Museo Nacional de Ciencias Naturales, Quito, Ecuador;
 MUSM: Museo de Historia Natural de la Universidad Nacional Mayor de San Marcos, Lima, Peru;
 MZUJ: Muzeum Zoologiczne Uniwersytetu Jagiellońskiego, Kraków, Poland;
 PUCE: Pontificia Universidad Católica, Quito, Ecuador;
 ZMHU: Zoologisches Museum, Humboldt Universität, Berlin, Germany;
 AJ: Collection of Artur Jasinski, Warsaw, Poland;
 KWJH: Collection of Keith Willmott and Jason Hall, Gainesville, Florida, U.S.A.;
 MB: Collection of Maurizio Bollino, Milan, Italy;
 PB: Collection of Pierre Boyer, Le Puy Sainte Réparate, France
 TWP: Collection of Tomasz Pyrcz, Warsaw, Poland

Lymanopoda ichu Pyrcz, Willmott & Hall n. sp.

(Figs 1 & 20)

DIAGNOSIS

This species is distinguished from the superficially similar *Lymanopoda excisa browni* n. ssp. (described below) by the less acute forewing apex, the straighter outer margin below the apex, by the hindwing ventral surface postmedian black dots which form a row parallel to the outer margin in *L. ichu*, instead of being incurved as in *L. excisa browni*, and by the basal area of the ventral forewing being black except for a small brown marking in the discal cell. *L. caracara* n. sp. (described below) is also similar but is larger, has a more acute forewing apex, paler dorsal ground colour, and has the base of the forewing costa dark brown, not orange-brown. The genitalia (Fig. 20) are devoid of a dorsal process on the valve and in this respect are similar to *L. caracara* (Fig. 18), *L. huilana huilana* Weymer, 1890, (Fig. 27) and *L. melia* Weymer, 1911, (Fig. 28). Both *L. ichu* and *L. caracara* share a hooked uncus, the dorsal surface of which is V-shaped when viewed posteriorly, which is noticeably more deeply cleft in *L. caracara*. The valvae are also slightly more elongate in *L. caracara*. *L. huilana* and *L. melia* differ from both *L. ichu* and *L. caracara* in that the valvae are ended distally by a series of spines. *L. melia* is exceptionally variable in the shape, proportions and sclerotization of some main structures, especially the valvae. The individual illustrated (Fig. 28) corresponds to a population found on the western slopes of the Central Cordillera in Huila (Colombia).

DESCRIPTION

Male (Fig. 1): **Head:** frons with tuft of dark brown hair; eyes brown, covered with sparse setae; labial palpi dorsally dark brown with few pale brown hairs, ventrally pale brown with few dark brown hairs; antennae 1/2 length of costa, brown and very sparsely scaled with white only at base of each segment, dorsal surface of club dark brown. **Thorax:** dorsal surface dark brown, ventral surface pale brown; legs pale brown. **Abdomen:** dorsal surface dark brown, ventral surface pale cream. **Wings:** forewing (length: 18-20 mm, mean: 19.2 mm, n=3) elongate, distal margin smoothly rounded; hindwing elongate and rounded. Forewing dorsal surface dark brown; basal third of costa orange-brown; a post-medial series of white dots, those in spaces Cu₁ and Cu₂ displaced basally in relation to others. Hindwing dorsal surface dark brown with tiny, faint postmedian white dots in spaces Cu₂-M₁. Forewing ventral surface ground colour black, dusted with ochreous along costa, on apex distally as white subapical dots and along outer margin; five white dots reflected from dorsal surface, those in Cu₁-M₃ ringed with black. Hindwing ventral surface ochreous, suffused with chestnut scales forming a poorly defined darker band stretching from base towards outer margin, except in lower half of discal cell; a series of black postmedian dots, parallel to outer margin, in spaces 1A+2A-M₁. **Male genitalia** (Fig. 20): valvae

lacking upper process; superuncus well developed; uncus hooked with shallow dorsal groove; aedeagus smooth.

Female: unknown.

TYPES

Holotype male: Ecuador: Loja: km. 20 Jimbura-San Andrés rd., 3300 m, 24.IX.1997, K. R. Willmott leg., to be deposited in BMNH. **Paratypes:** 2 males: same data as holotype, in K.W.J.H.

ETYMOLOGY

This species is named after the Quechua word "ichu", which is used to designate the bunch-grass typical of puna and páramo grassland in southern Ecuador and Peru—the habitats of this species.

REMARKS

L. ichu n. sp. is currently known only from the type locality in Ecuador. It is closely allied in facies to an undescribed species (Pyrcz, in prep.) occurring in the area of Chachapoyas in northern Peru, with which it shares similar wing shape and ventral surface colour pattern but differs considerably in the male genitalia. As for other Ecuadorian species, there are strong affinities with *L. caracara* n. sp., found further north, as indicated by genitalic morphology, the elongate wing shape, the shape of the row of postmedian black dots of the hindwing ventral surface and the similar habitat type and altitude. *L. ichu* is also related to *L. melia* on the same morphological and ecological grounds, even though *L. melia* is distinctly marked, being predominantly white. *L. ichu*, *L. caracara* and *L. melia* belong to a group including also *L. huilana* and *L. tolima* Weymer, 1911, whose diagnostic feature is that the postmedian black dots on the hindwing ventral surface form a row parallel to the outer margin.

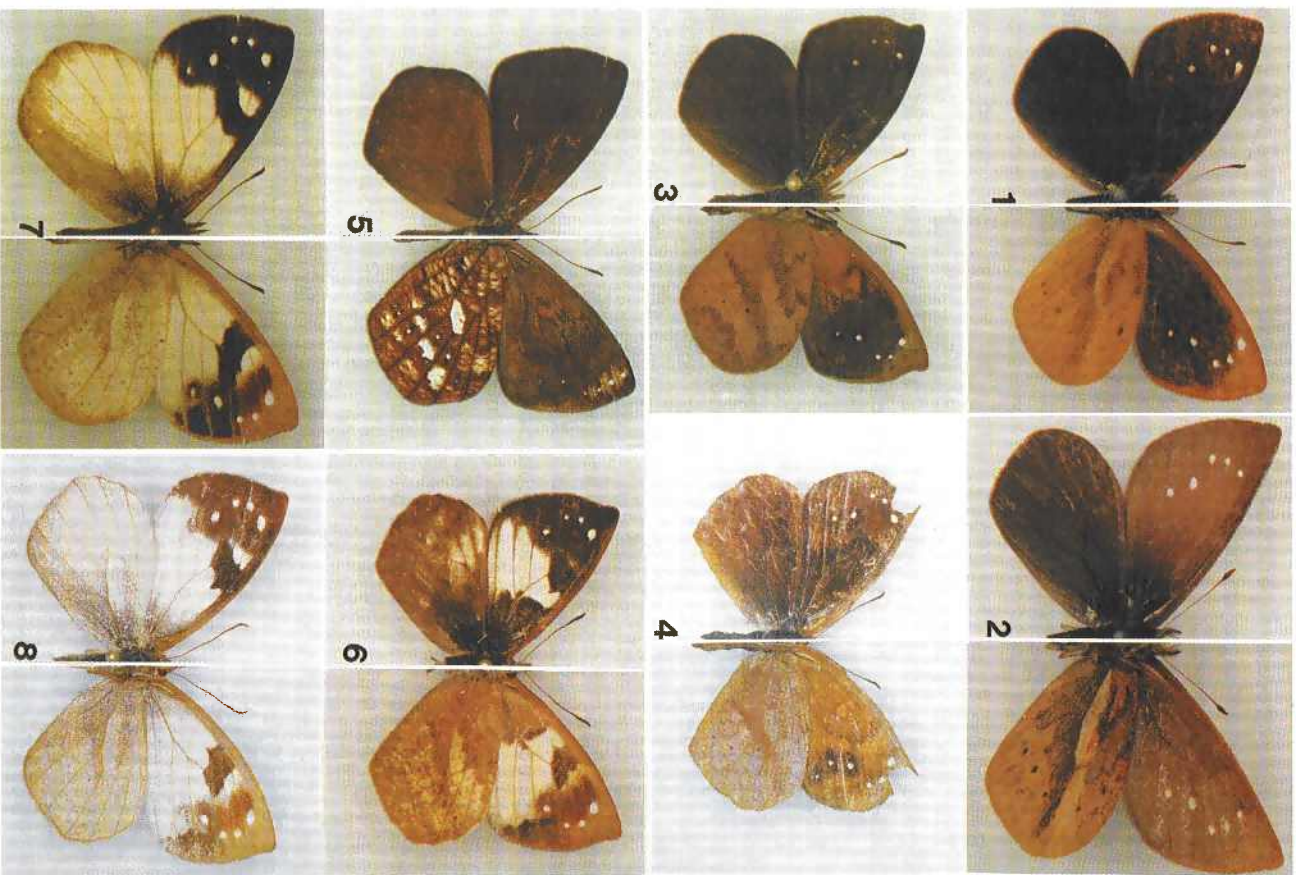
L. ichu was found only at a single site along the Jimbura-San Andrés road, at a steep, small landslide through a pocket of elfin cloud forest surrounded by páramo. This landslide had extensive bamboo secondary growth, and individuals were found flying just above the surface of the bamboo during a long period of bright sun.

Lymanopoda caracara Pyrcz, Willmott & Hall n. sp.

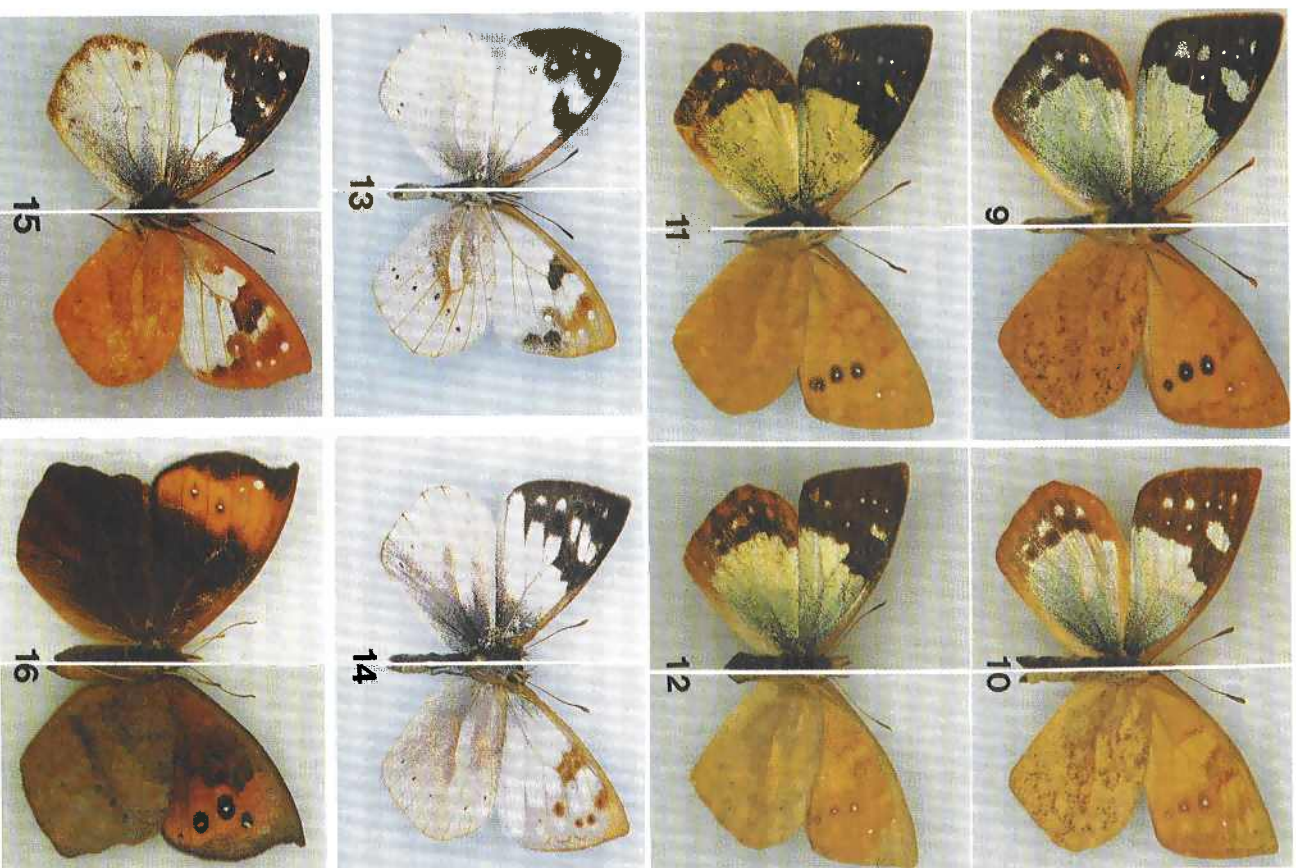
(Figs 2 & 18)

DIAGNOSIS

This species has the same elongated fore and hindwings and overall hindwing ventral surface colour pattern as *L. huilana* and *L. tolima*, but is immediately distinguished from these species by being entirely chestnut on the dorsal surface. It is also similar to *L. ichu* n. sp., described above (see Diagnosis under that



1. *Lymanopoda ichu* n. sp. male, dorsum/venter; 2. *L. caracara* n. sp. male, dorsum/venter; 3. *L. excisa browni* n. ssp. male, dorsum/venter; 4. *Lymanopoda excisa browni* n. ssp. female, dorsum/venter; 5. *L. nadia* n. sp. male, dorsum/venter; 6. *L. labineia pintasi* n. ssp. male, dorsum/venter; 7. *L. nivea bingo* n. ssp. male, dorsum/dorsum; 8. *L. nivea bingo* n. ssp. female, dorsum/dorsum



9. *Lymanopoda hazelana summa* n. ssp. male, dorsum/venter; 10. *L. hazelana summa* n. ssp. female, dorsum/venter; 11. *L. hazelana hazelana* male, dorsum/venter; 12. *L. hazelana hazelana* female, dorsum/venter; 13. *L. nivea nivea* male, dorsum/venter; 14. *L. melia* male, dorsum/venter; 15. *L. nivea bonita* n. ssp. male, dorsum/venter; 16. *L. confusa* female, dorsum/venter;

